REPORT OF ARTHUR REINGOLD, MD

Coleman v. Schwarzenegger et al.,

No. Civ. S-90-0520 LKK

Plata v. Schwarzenegger et al.,

No. C01-1351 T.E.H.

AUGUST 27, 2008

REPORT OF ARTHUR REINGOLD, MD

Expert Qualifications

1. I am a medical doctor and professor of epidemiology, with thirty years experience in the fields of epidemiology and statistical analysis of epidemiological data. My curriculum vitae is attached as Exhibit A.

2. I obtained both my undergraduate and medical degrees at the University of Chicago in 1970 and 1976, respectively. I completed my residency in Internal Medicine at the Mount Auburn Hospital in Cambridge, Massachusetts in 1978, and a second residency in Preventive Medicine at the Centers for Disease Control (CDC) in Atlanta, Georgia in 1982.

3. I worked as an Epidemic Intelligence Service Officer for the CDC, first in Connecticut, and then in Atlanta, from 1979-1981. From 1981-1982, I was a Preventive Medicine Resident. I then became the Assistant Chief for the Respiratory and Special Pathogens Epidemiology Branch at the CDC for three years. From 1985-1987, I worked as a CDC Liaison Officer, assigned to the School of Public Health at UC Berkeley, and also had an appointment as a visiting lecturer in the Department of Biomedical and Environmental Health Sciences (Epidemiology).

4. In 1987, I was hired as a Professor of Epidemiology in the School of Public Health. In addition to my appointment at UC Berkeley, I am also appointed as a Professor of Epidemiology and Biostatistics and as a Clinical Professor in the Department of Medicine at the University of California, San Francisco.

Comparative State Prison Mortality Rates

5. I have reviewed the Bureau of Justice Statistics Data Brief entitled Medical Causes of

Death in State Prisons, 2001-2004 by Christopher Mumola, attached hereto as Exhibit B, and the data attached to the December 18, 2007 letter from Jeffrey L. Sedgwick to S. Anne Johnson, attached hereto as Exhibit C.

6. Based on a review of state prisoner mortality, the Data Brief reports that, as expected, the rates of death among prisoners vary widely based on personal characteristics of the prisoners, including sex, ethnicity, length of sentence and, most importantly, age.

7. According to the report, women state prisoners die at a rate of 149 deaths per 100,000, while the men's death rate is 257 per 100,000. Black and Hispanic prisoners have a death rate of 206 per 100,000, while white prisoners' death rate is 343 per 100,000.

8. The report demonstrates that, as expected, age is the most significant predictor of death rates among prisoners. For prisoners aged 55 and older, the annual death rate is 1973 per 100,000. For those aged 45-54, the rate is 566 per 100,000, and for those 35-44, the rate is 177 per 100,000. For younger prisoners, the rates are much lower: for those 25-34, the rate is 64 per 100,000 and for those 15-24, the rate is 34 per 100,000. So, the death rate for prisoners over 55 is roughly 30 times the death rate for the youngest prisoners.

9. According to the data provided with the letter of December 18, 2007, from Jeffrey L. Sedgwick to S. Anne Johnson (attached as Exhibit C), California's average annual illness mortality death rate per 100,000 state prisoners between 2001 and 2005 was 172 per 100,000. During that same period, the average annual illness mortality death rate for prisoners in all states was 224 per 100,000.

10. Some may argue from the fact that California's prisoner death rate appears to be 23% lower than the national average that California's state prisoners' risk of death from

inadequate health care is lower than that of prisoners in other state prison systems. In fact, no such conclusion may by drawn.

11. The death rates of any state prison system will reflect the demographics of the prisoner population. Given the substantial variability in death rates by gender, ethnicity and length of prison stay, and especially the extreme variability in death rates relating to age, comparing the overall death rates between state prison systems as a whole reveals nothing about the relative strength or weakness of the medical care delivery system of the respective states' prison systems. For example, a prison system with a large proportion of older male white prisoners serving long sentences and a low proportion of younger Hispanic women serving brief sentences will have a higher annual death rate than a prison system where the proportions are reversed. Any comparison of mortality rates between prison systems that does not adjust for (*i.e.,* take into account) age and other crucial factors such as gender, ethnicity, and length of stay is meaningless.

12. Additionally, the death rates of a state prison system will reflect, to some extent, the death rates for the state's population at large. I have reviewed the National Vital Statistics Reports, Volume 56, Number 10, dated April 24, 2008. According to Table 29 of that report, California's annual death rate for the year 2005 was the fourth lowest of the fifty states, at 656 per 100,000. Annual death rates for the fifty states range from 477 (Alaska) to 1144 (West Virginia) per 100,000. When the populations were adjusted for age, California's annual death rate for that period was fifth lowest of the fifty states, at 713 per 100,000. The age-adjusted death rates for the fifty states range from 684 (Minnesota) to 1027 (Mississippi) per 100,000.

13. Because California state prisons incarcerate primarily California state residents, I

would expect the death rate for California state prisoners to be lower than the rate for prisoners from other states with higher general population death rates.

14. According to the Bureau of Justice Statistics data provided to defendants by Jeffrey Sedgwick, the death rate for California state prisoners ranks 14th lowest among the fifty states. Thus, while California has a very low death rate for its general population, its death rate for state prisoners is relatively higher.

15. As Mr. Mumola admits in his deposition, in calculating the death rates for prison systems, the Bureau of Justice Statistics does not control for age, gender, ethnicity, length of stay, or other variables. See Deposition of Christopher J. Mumola, August 25, 2008 (Rough Draft), at 49:6-50:20. Therefore, comparisons between the state prison systems' death rates are meaningless. Moreover, comparison between state prison systems should take into account the differences in death rates for the populations from which the prisoners are drawn for the comparisons to be significant.

Low Prisoner Death Rates Due to Fewer Accidental Deaths

16. The Bureau of Justice Statistics Data Brief reports that state prisoners have a 19% lower death rate than the adult U.S. population. Specifically, the Data Brief reports that state prisoners aged 15-64 had an average annual mortality rate of 250 per 100,000 during the years 2001-2004, compared to a rate of 308 per 100,000 for the same age cohort in the adult U.S. population from 2001-2003.

17. When the death rates for age cohorts are considered separately, the Data Brief shows that, for the age cohorts aged 44 and under, the mortality rates for state prisoners are lower than for U.S. residents generally. For the age cohorts aged 45 and over, the mortality rates for state

prisoners are higher than for U.S. residents generally.

18. As noted above, I have reviewed the National Vital Statistics Reports, Volume 56, Number 10, dated April 24, 2008. I included in my review, Table 9, entitled "Death rates by age and age-adjusted death rates for the 15 leading causes of death in 2005: United States, 1999-2005."

19. According to Table 9, the leading cause of death in the United States for people aged 15-44 in 2005 was unintentional injury. In 2005, for people aged 45-54, unintentional injury was the third leading cause of death, and for people 55-64, it was the fifth leading cause of death.

20. For state prisoners, unintentional injury is not a significant cause of death: the Data Brief reports that the five leading causes of state prisoner deaths are heart diseases, cancer, liver diseases, AIDS and suicide. Unintentional injury is not listed in the top ten causes of deaths for state prisoners. According to Appendix Table 12, "accidental injury" is the 16th highest cause of death among state prisoners, accounting for fewer deaths than homicide and alcohol/drug intoxication.

21. Thus, state prisoners aged 44 and under have a lower mortality than U.S. non-prisoners primarily because they have an extremely low rate of death from unintentional injury.

22. Mr. Mumola notes that excluding traffic accidents from his calculations explains some but not all of the discrepancy between in-prison and out-of-prison mortality rates. Mumola Deposition at 57:22-58:8. This does not surprise me, since there exist other factors such as other forms of unintentional injury as well as homicides (discussed below) that are present to a far greater degree outside of prison than inside.

Lower Prisoner Death Rates Due to Lower In-Prison Homicide Rates for Black Men

23. Mr. Mumola provides another reason why mortality rates among prisoners might be lower than mortality rates among the general population. He notes that non-prisoners are far more likely than prisoners to be homicide victims. Mumola Deposition at 58:22-59:2. Since young black men have an extremely high homicide mortality rate and also the highest incarceration rate of any group, Mr. Mumola concludes that "lower death rates for black males in prison are likely a major contributing factor in the overall lower rate of death for state prisoners age 15 to 64." Mumola Deposition at 60:4–7. I agree.

Conclusion

24. In sum, it is impossible to draw any meaningful conclusions about the risk of death from inadequate health care in California prisons from Mr. Mumola's deposition testimony or the data to which he refers. In order to analyze the risk of death from inadequate health care in California prisons, it would be necessary to compare mortality rates in and out of prison for each individual illness (heart disease, diabetes, etc.) while controlling for crucial factors such as age, race, and gender. Mr. Mumola has not done so. See Mumola Deposition at 47:19-49:5 ("it is very difficult to discern the level of impact each of these factors [such as age, gender, race and length of time served] may have" and such an attempt would require "[c]areful analysis," since "the overall mortality rate for any system is [a] result of many factors interacting together").

Expert Compensation

25. Plaintiffs have retained my services in this case at my consulting rate of $250 per hour, with a four hour minimum for depositions and for trial testimony.

Publications and Testimony in Other Cases

26. Please see my curriculum vitae, attached as Exhibit A, for a listing of my

publications, and Exhibit D for a list of other cases in which I have testified.

Dated: August 27, 2008

ARTHUR REINGOLD

EXHIBIT A

CURRICULUM VITA

Arthur Lawrence Reingold

PRESENT POSITION: Professor of Epidemiology
Head, Division of Epidemiology
School of Public Health
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Berkeley, California 94720-7358
Phone: (510) 642-0327
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DATE OF BIRTH: October 31, 1948

PLACE OF BIRTH: Chicago, Illinois

MARITAL STATUS: Married

EDUCATION:

1966 - 70	A.B.	University of Chicago
1970 - 76	M.D.	University of Chicago

POSITIONS HELD:

1979 - 80	Epidemic Intelligence Service Officer, State of Connecticut - Department of Health Services Hartford, Connecticut
1980 - 81	Epidemic Intelligence Service Officer, Special Pathogens Branch - Bacterial Diseases Division Centers for Disease Control (CDC) - Atlanta, Georgia
1981 - 85	Assistant Chief, Respiratory & Special Pathogens Epidemiology Branch, Center for Infectious Diseases Centers for Disease Control (CDC) - Atlanta, Georgia
1985 - 87	CDC Liaison Officer, Office of the Director Centers for Disease Control - Atlanta, Georgia

POSTGRADUATE TRAINING:

1976 - 78	Internal Medicine Resident, Mount Auburn Hospital Cambridge, Massachusetts
1980 - 82	Preventive Medicine Resident, Centers for Disease Control (CDC) - Atlanta, Georgia

FACULTY APPOINTMENTS:

1979 - 80	Instructor, Department of Medicine (Epidemiology) University of Connecticut - Hartford, Connecticut
1985 - 87	Visiting Lecturer, Department of Biomedical and Environmental Health Sciences (Epidemiology) University of California, Berkeley
1987 -	Professor of Epidemiology, School of Public Health, University of California, Berkeley
1989 -	Professor, Department of Epidemiology and

		Biostatistics - University of California, San Francisco
FACULTY APPOINTMENTS (CONTINUED)	1990 - 94	Head, Epidemiology Program, Department of Biomedical and Environmental Health Sciences, University of California, Berkeley
	1991 -	Clinical Professor, Department of Medicine University of California, San Francisco
	1994 - 2000	Head, Division of Public Health Biology and Epidemiology University of California, Berkeley
	2000 -	Head, Division of Epidemiology, School of Public Health, University of California, Berkeley

MEDICAL LICENSURE: California

BOARD CERTIFICATION:	1980	American Board of Internal Medicine
AWARDS:	1970 - 74	Medical Scientist Training Program
	1985	Commendation Medal, U.S. Public Health Service
	1986	Charles Shepard Award, Centers for Disease Control (CDC)
MEMBERSHIPS:	1970	Sigma Xi
	1978	American College of Physicians
	1983	American Society for Microbiology
	1984	Society for Epidemiologic Research
	1986	Infectious Disease Society of America (Fellow)
	1988	American Epidemiological Society
	1991	American College of Epidemiology (Fellow)
	1994	AAAS (Fellow)
	2003	Institute of Medicine (Member)

PROFESSIONAL ACTIVITIES

CONSULTATIONS:	1981	Institute of Medicine: Toxic-shock syndrome
	1981	Food and Drug Administration: Toxic-shock syndrome
	1982	United States Agency for International Development: Control of meningococcal meningitis in West Africa
	1983	World Health Organization (WHO): Control of meningococcal meningitis in Nepal
	1983	East-West Center, University of Hawaii: Role of indoor airpollution in acute respiratory infections in developingcountries
	1984	Institute of Medicine: Meningococcal vaccines
	1986	World Health Organization (WHO):

		Control of meningococcal meningitis in South Asia
CONSULTATIONS: (CONTINUED)	1987 - 1993	Center for Child Survival, University of Indonesia: Control of Acute Respiratory Infections
	1988	Evaluation of the Combating Communicable Childhood Disease Program, Ivory Coast
	1994	Evaluation of National Epidemiology Board Program, Rockefeller Foundation
	1995	Planning of a School-based Acute Rheumatic Fever Prevention Project - New Zealand Heart Foundation
	1995	Vaccines Advisory Committee, Food & Drug Administration Approval of accellular pertussis vaccine
	1996	External Reviewer, NIAID Group B Streptococcus Research Contract with Harvard University
	1996 -	U.S. Food and Drug Administration; Consultant to the Vaccines Advisory Committee
	1996	World Health Organization, Consultation on Control of Meningococcal Meningitis in Africa
	1998 – 2002	Advisor to the INCLEN "Indiaclen" project
	2002 – 2003	Evaluation of a School-based Acute Rheumatic Fever Prevention Project – New Zealand Heart Association
ADVISORY BOARDS AND PANELS:	1988 - 1989	Member, Advisory Committee on Ground Water and Reproductive Outcomes, State of California Department of Health Services
	1989 - 1990	AIDS Advisory Committee, Alameda County Board of Supervisors
	1989 - 1993	Advisory Committee, Birth Defects Monitoring Program, State of California Department of Health Services
	1993	Centers for Disease Control (CDC): Public Health Service Advisory Panel on the Case Definition for Lyme Disease
	1992 - 1994	World Health Organization (WHO): Task Force on Strengthening Epidemiologic Capacity; Childhood Vaccine Initiative
	1996 - 2000	Armed Forces Epidemiological Board
	1997 -	University of California, San Francisco AIDS Research Institute Steering Committee
	1998 -	Emerging Infections Committee of the Infectious Diseases Society of America
	1998 – 2000	Panelist, Howard Hughes Medical Institute Predoctoral Fellowship

	2001 -	Technical expert, Sub-Committee on the Protection of Public Health; California State Strategic Committee on Terrorism
	2003 -	Advisory Board, Chinese University of Hong Kong – Centre for Emerging Infectious Diseases
Advisory Boards and Panels (continued)	2004 -	Advisory Board, University of California, Berkeley Clinical Research Center
	2004 -	Advisory Board, New York University School of Medicine Fellowship in Medicine and Public Health Research
	2004 - 2005	Institute of Medicine Committee on Measures to Enhance the Effectiveness of CDC Quarantine Station Plan for U.S. Ports of Entry
	2005 -	Strategic Advisory Group of Experts (SAGE) for Vaccine Policy, World Health Organization (WHO)
	2005 -	Data and Safety Monitoring Committee; F.I. Proctor Foundation, University of California, San Francisco (UCSF)
	2007 -	NIH Fogarty International Center Advisory Board
	2008 -	Institute of Medicine Committee on the Review of Priorities in the National Vaccine Plan
EDITORIAL BOARDS:	1995 - 2000	Board of Editors, American Journal of Epidemiology
	2001 - 2005	Board of Editors, Epidemiology
	2005 -	Editorial Advisory Board, Global Public Health

PUBLICATIONS:

1. Hayes RV, Pottenger LA, Reingold AL, Getz GS, Wissler RW. Degradation of I^{125} - labeled serum low density lipoprotein in normal and estrogen-treated male rats. Biochem Biophys Res Comm 1971;44:1471-1477.

2. Reingold AL, Kane MA, Murphy BL, Checko P, Francis DP, Maynard JE. Transmission of hepatitis B by an oral surgeon. J Infect Dis 1982;145:262-268.

3. Reingold AL, Dan BB, Shands KN, Broome CV. Toxic-shock syndrome not associated with menstruation: a review of 54 cases. Lancet 1982;1:1-4.

4. Bartlett P, Reingold AL, Graham DR, et al. Toxic-shock syndrome associated with surgical wound infections. JAMA 1982;247:1448-1450.

5. Reingold AL, Hargrett NT, Shands KN, et al. Toxic-shock syndrome surveillance in the United States, 1980-1981. Ann Intern Med 1982;96:875-880.

6. Reingold AL, Hargrett NT, Dan BB, Shands KN, Strickland BY, Broome CV. Nonmenstrual toxic-shock syndrome: a review of 130 cases. Ann Intern Med 1982;6:871-874.

7. Broome CV, Hayes PS, Ajello GW, Feeley JC, Gibson RJ, Graves LM, Hancock GA, Anderson RJ, Highsmith AK, Mackel DC, Hargrett NT, Reingold AL. In-vitro studies of interactions between tampons and Staphylococcus aureus. Ann Intern Med 1982;96:959-962.

8. Guinan ME, Dan BB, Guidotti RJ, Reingold AL, et al. Vaginal colonization with Staphylococcus aureus in healthy women: a review of four studies. Ann Intern Med 1982;96(pt.2):944-947.

9. Schlech WF III, Shands KN, Reingold AL, et al. Risk factors for development of toxic-shock syndrome: association with a tampon brand. JAMA 1982;248:835-839.

10. Reingold AL, Bank JD. Legionellosis. In: Easmon CSF, Jeljaszewicz J, eds. Medical Microbiology. London: Academic Press 1982 (I):217-239.

11. Reingold AL. Toxic-shock syndrome. In: Spittell JA Jr., ed. Clinical Medicine. Philadelphia: Harper & Row Publishers 1982 (II):1-6.

12. Kornblatt AN, Reingold AL. Legionellosis. In: Steele JH, Hillyer RV, Hopla CE, eds. CRC Handbook Series in Zoonoses. CRC Press 1982:313-324.

13. Wilkinson HW, Reingold AL, Brake JB, McGiboney DL, Gorman GW, Broome CV. Reactivity of serum from patients with suspected Legionellosis against 29 antigens of legionellaceae and Legionella-like organisms by indirect immunofluorescence assay. J Infect Dis 1983;147:23-31.

14. Meenhorst PL, Reingold AL, Gorman GW, et al. Legionella pneumonia in guinea pigs exposed to aerosols of concentrated potable water from a hospital with nosocomial Legionnaires' disease. J Infect Dis 1983;147:129-132.

15. Reingold AL. Nonmenstrual toxic-shock syndrome: the growing picture. JAMA 1983; 249:932 (editorial).

16. Reingold AL. Meningococcal meningitis. Nepal Paed Soc J 1983; 2:144-148.

17. Reingold AL, Broome CV, Phillips CJ, Meda H, Tiendrebeogo H, Yada A. Evidence of continuing protection against group A meningococcal disease one year after vaccination: a case-control approach. Med Trop 1983;43:225.

18. Reingold AL, Kane MA, Hightower AW. Disinfection procedures and infection control in the outpatient oral surgery practice. J Oral Maxillofac Surg 1984;42:568-572.

19. Broome CV, Reingold AL. Current issues in toxic-shock syndrome. In: Remington JS, Swartz MN, eds. Current clinical topics in infectious diseases. McGraw Hill 1984;65-85.

20. Herwaldt LA, Gorman GW, McGrath T, Toma S, Brake B, Hightower AW, Jones J, Reingold AL, et al. A new Legionella species, Legionella feeleii species nova, causes Pontiac fever in an automobile plant. Ann Intern Med 1984;100:333-338.

21. Ajello GW, Feeley JC, Hayes PS, Reingold AL, Bolan G, et al. Trans-isolate medium: a new medium for primary culturing and transport of Neisseria meningitidis, Streptococcus pneumoniae, and Haemophilus influenzae. J Clin Microbial 1984;20:55-58.

22. Hayes PS, Graves LM, Feeley JC, Hancock GA, Cohen ML, Reingold AL, et al. Production of toxic-shock-associated protein(s) in Staphylococcus aureus strains isolated from 1956 through 1982. J Clin Microbial 1984;20:42-46.

23. Reingold AL, Thomason BM, Brake BJ, Thacker L, Wilkinson HW, Kuritsky JN. Legionella pneumonia in the United States: the distribution of serogroups and species causing human illness. J Infect Dis 1984;149:819.

24. Blaser M, Reingold AL, Alsever RN, Hightower A. Primary meningococcal pericarditis: A disease of adults associated with serogroup C Neisseria meningitidis. Rev Infect Dis 1984;6:625-632.

25. Jones EE, Alford PL, Reingold AL, et al. Predisposition to invasive pneumococcal illness following parainfluenza type 3 virus infection in chimpanzees. JAVMA 1984;185:1351-1353.

26. Reingold AL, Thomason BM, Kuritsky J. Results of Legionnaires' disease direct fluorescent-antibody testing at Centers for Disease Control, 1980-1982. In: Thornsberry C, Balows A, Feeley JC, and Jakubowski J, eds. Legionella, ASM 1984;21-22.

27. Kuritsky JN, Reingold AL, Hightower AW, Broome CV. Sporadic Legionellosis in the United States, 1970 to 1982. In: Thornsberry C, Balows A, Feeley JC, and Jakubowski J, eds. Legionella, ASM 1984;243-245.

28. Fleming DW, Reingold AL. Legionella. In: Braude AI ed. Medical Microbiology and Infectious Diseases, Second Edition W.B. Saunders 1985;352-358.

29. Garbe PL, Arko RJ, Reingold AL, et al. Staphylococcus aureus isolates from patients with non-menstrual Toxic Shock Syndrome: Evidence for Additional Toxins. JAMA 1985;253:2538-2542.

30. Garbe PL, Davis BJ, Weisfeld J, Markowitz L, Miner P, Garrity F, Barbaree JM, Reingold AL. Nosocomial Legionnaires' Disease: Epidemiologic Demonstration of Cooling Towers as a Source. JAMA 1985;254:521-524.

31. Fleming DW, Cochi SL, MacDonald KL, Brondum J, Haves PS, Plikaytis BD, Holmes MB, Audurier A, Broome CV, Reingold AL. Pasteurized milk as a vehicle of infection in an outbreak of listeriosis. NEJM 1985;312:404-407.

32. Meenhorst P, Reingold AL, Groothius DL, et al. Water-related nosocomial pneumonia caused by Legionella pneumophila serogroups 1 and 10. J Infect Dis 1985;152:356-364.

33. Bolan G, Reingold AL, Carson L, et al. Infections with Mycobacterium chelonei in patients receiving dialysis and using processed hemodialyzers. J Infect Dis 1985;152:1013-1019.

34. Reingold AL. Toxic-shock in the United States of America: epidemiology. Postgrad Med J 1985;61:21-22.

35. Reingold AL, Broome CV, Hightower AW, et al. Age-specific differences in duration of clinical protection after vaccination with meningococcal polysaccharide A vaccine. Lancet 1985;II:114-118.

36. Petitti DB, Reingold AL, Chin J. The incidence of toxic-shock syndrome in Northern California: 1972-1983. JAMA 1986;255:368-372.

37. Reingold AL. Toxic-shock syndrome and the contraceptive sponge. JAMA 1986;255:242-243 (editorial).

38. Berkley S, Reingold AL. Toxic-shock syndrome. In: Kass EH and Platt R, eds. Current Therapy in Infectious Disease. B.C. Decker, Inc. 1986;78-81.

39. Reingold AL. Toxic-shock syndrome. In: Wheat J and White A, eds. Infectious Diseases, University of Chicago Press, 1986.

40. Reingold AL, Broome CV. Nosocomial central nervous system infections. In: Bennett JV, Brachman PS, eds. Hospital Infections. Little Brown & Co. 1986;521-529.

41. Markowitz L, Reingold AL. Toxic-shock syndrome. In: Maxcy-Rosenau Public Health and Preventive Medicine, 12th edition Appleton-Century-Crofts 1986;456-459.

42. Reingold AL, Xiao DL, Plikaytis B, Ajello L. Systemic mycoses in the United States, 1980-1982. J Med Vet Mycol 1986;24:433-436.

43. Cochi SL, Markowitz L, Owens Jr RC, Stenhouse DH, Regmi DN, Shrestha RPB, Acharya IL, Manandhar M, Gurubacharya VL, Owens D, Reingold AL. Control of epidemic group A meningococcal meningitis in Nepal. Int J Epid 1987;16:91-97.

44. Markowitz LE, Hightower AW, Broome CV, Reingold AL. Toxic-shock syndrome: Evaluation of national surveillance data using a hospital discharge survey. JAMA 1987;258:75-78.

45. Berkley SF, Hightower AW, Reingold AL, Broome CV. The relationship of tampon characteristics to menstrual toxic-shock syndrome. JAMA 1987;258:917-920.

46. Reingold AL, Kane MA, Hightower AW. Failure of gloves and other protective devices to prevent transmission of hepatitis B virus in oral surgeons. JAMA 1988;259:2558-2560.

47. Reingold AL. The role of Legionellae in acute infections of the lower respiratory tract. Rev Infect Dis 1988;10(5):1018-1028.

48. Harrison LH, Broome CV, Hightower AW, Hoppe CC, Makintubee S, Sitze SL, Taylor JA, Gaventa S, Wenger JD, Facklam RR, and the *Haemophilus Vaccine Efficacy Study Group* (includes A.L. Reingold). A day-care based study of the efficacy of Haemophilus influenzae B polysaccharide vaccine. JAMA 1988;260(10):1413-1418.

49. Schwartz B, Broome CV, Hightower AW, Brown GR, Ciesielski CA, Gaventa S, Gellin BG, Mascola L, and the *Listeriosis Study Group* (includes A.L. Reingold). Association of sporadic listeriosis with consumption of uncooked hot dogs and undercooked chicken. Lancet 1988;II:779-782.

50. Carson LA, Bland LA, Cusick LB, Favero MS, Bolan G, Reingold AL, et al. Prevalence of nontuberculous mycobacteria in water supplies of hemodialysis centers. Appl Environ Micro 1988; 54:3122-3125.

51. Petitti DB, Reingold AL. Update through 1985 on the incidence of toxic shock syndrome among members of a prepaid health plan. Rev Infect Dis 1989;11:S22-27.

52. Reingold AL, Broome CV, Gaventa S, Hightower SW, and the Toxic-Shock Syndrome Study Group. Risk factors for menstrual toxic-shock syndrome: results of a multi-state case-control study. Rev Infect Dis 1989;11:S35-42.

53. Gaventa S, Reingold AL, Hightower AW, et al. Active surveillance for toxic-shock syndrome in the United States, 1986. Rev Infect Dis 1989;11:S28-34.

54. Schwartz B, Gaventa S, Broome CV, Reingold AL, et al. Non-menstrual toxic-shock syndrome associated with barrier contraceptives: report of a case-control study. Rev Infect Dis 1989;11:S43-49.

55. Reingold AL, Hearst N. Identifying the health care needs of the community. In: Overall N, Williamson J, eds. Community Oriented Primary Care in Action: A Practice Manual for Primary Care Settings. U.S. Department of Health and Human Services.

56. Koo D, Bouvier B, Wesley M, Courtright P, Reingold AL. Epidemic keratoconjunctivitis in a university medical center ophthalmology clinic: need for re-evaluation of the design and disinfection of instruments. Inf Control and Hosp Epi 1989;10:547-552.

57. Harrison LH, Broome CV, Hightower AW, and the *Haemophilus Vaccine Efficacy Study Group* (includes A.L. Reingold). Haemophilus influenzae type b polysaccharide vaccine: an efficacy study. Pediatrics 1989;84:225-261.

58. Wenger JD, Harrison LH, Hightower A, Broome CV, *Haemophilus* influenzae Study Group (includes A.L. Reingold). Day care characteristics associated with Haemophilus influenzae disease. Am J Public Health 1990;80:1455-1458.

59. Morrow HW, Slaten DD, Reingold AL, et al. Risk factors associated with a school-related outbreak of serogroup C meningococcal disease. Pediatric Infect Dis J 1990;9:394-398.

60. Wenger JD, Hightower AW, Facklam RR, Gaventa S, Broome CV, *Bacterial Meningitis Study Group* (includes A.L. Reingold). Bacterial meningitis in the United States, 1986: Report on a multistate surveillance study. J Infect Dis 1990;162:1316-1323.

61. Reingold AL. Toxic-shock syndrome. In: Evans AS, Brachman PS, eds. Bacterial Infections of Humans. Plenum, 1991;727-743.

62. Gellin BG, Broome CV, Bibb WF, Weaver RE, Gaventa S, Mascola L, the *Listeriosis Study Group*. (includes A.L. Reingold). The epidemiology of listeriosis in the United States - 1986. Am J Epi 1991;133:392-401.

63. Reingold AL. Toxic-shock syndrome. In: Rakel RE, ed. Conn's Current Therapy. W. B. Saunders, 1991;1010-1012.

64. Reingold AL, Markowitz LE. Toxic-shock syndrome. In: Maxcy-Rosenau Public Health and Preventive Medicine, 13th Edition. Appleton-Century-Crofts, 1991;304-306.

65. Bauer HM, Ting Y, Greer CE, Chambers JC, Tashiro CJ, Chimera J, Reingold AL, Manos MM. Genital human papillomavirus infection in female university students as determined by a PCR-based method. JAMA 1991;265:472-477.

66. Sutrisna B, Frerichs RR, Reingold AL. Randomised, controlled trial of effectiveness of ampicillin in mild acute respiratory infections in Indonesian children. Lancet 1991;338:471-474.

67. Reingold AL. Toxic-shock syndrome: an update. Am J Ob & Gyn 1991;165:1236-1239.

68. Pettiti DB, Reingold AL. Recent trends in the incidence of toxic-shock syndrome in Northern California. Am J Public Health 1991;81:1209-1211.

69. Ley C, Reingold AL, et al. Determinants of genital human papillomavirus infection in young women. JNCI 1991;83:997-1003.

70. Pinner RW, Gellin BG, Bibb WF, Baker CN, Weaver R, Hunter SB, Waterman SH, Mocca LF, Frasch CE, Broome CV, the *Meningococcal Disease Study Group* (includes A.L. Reingold). Meningococcal disease in the United States-1986. J Infect Dis 1991;164:368-374.

71. Wenger JD, Pierce R, Deaver KA, Plikaytis BD, Facklam RR, Broome CV, and the *Haemophilus influenzae Study Group* (includes A.L. Reingold). Efficacy of Haemophilus influenzae type b polysaccharide-diphtheria toxoid conjugate vaccine in U.S. children aged 18-59 months. Lancet 1991; 338:395-398.

72. Moore PS, Plikaytis BD, Bolan GA, Oxtoby MJ, Yada A, Zoubga A, Reingold AL, Broome CV. Detection of meningitis epidemics in Africa: a population-based analysis. International J Epi 1992;21:155-162.

73. Schuchat A, Deaver KA, Wenger JD, Plikaytis BD, Mascola L, Pinner RW, Reingold AL, Broome CV, and the Listeria Study Group. Role of foods in sporadic listeriosis. I. Case-control study of dietary risk factors. JAMA 1992;267:2041-2045.

74. Pinner RW, Schuchat A, Swaminathan B, Hayes PS, Deaver KA, Weaver RE, Plikaytis BD, Reeves M, Broome CV, Wenger JD, and the *Listeria Study Group* (includes A.L. Reingold). Role of foods in sporadic listeriosis. II. Microbiologic and epidemiologic investigation. JAMA 1992; 267:2046-2050.

75. Wenger JD, Pierce R, Deaver K, Franklin R, Bosley G, Pigott N, Broome CV, and the *Listeria Study Group* (includes A.L. Reingold). Invasive Haemophilus influenzae disease: A population-based evaluation of the role of capsular polysaccharide serotype. J Infect Dis 1992;165(suppl 1):S34-5.

76. Steinhart R, Reingold AL, Taylor F, Anderson G, Wenger JD. Invasive Haemophilus influenzae infections in men with HIV infection. JAMA 1992;268:3350-3352.

77. Hayes PS, Graves LM, Swaminathan B, Ajello GW, Malcolm GB, Weaver RE, Ransom R, Deaver K, Plikaytis BD, Schuchat A, Wenger JD, Pinner RW, Broome CV, and the *Listeria Study Group* (includes A.L. Reingold). Comparison of three selective enrichment methods for the isolation of Listeria monocytogenes naturally contaminated foods. J of Food Protection, 1992; 55:952-959.

78. Osmond DH, Charlebois E, Sheppard HW, Page KA, Winkelstein W Jr, Moss AR, Reingold AL. A comparison of risk factors for hepatitis C and hepatitis B virus infection in homosexual men. J Infect Dis, 1993;167:66-71.

79. Osmond DH, Padian N, Sheppard HW, Glass S, Shiboski SC, Reingold AL. Risk factors for hepatitis C virus seropositivity in heterosexual couples. JAMA 1993;269:361-365.

80. Tappero JW, Koehler JE, Berger TG, Reingold AL, et al. Bacillary angiomatosis and bacillary splenitis in immunocompetent adults. Ann Int Med, 1993;118:363-365.

81. Tappero JW, Mohle-Boetani J, Koehler JE, Reingold AL, et al. The epidemiology of bacillary angiomatosis and bacillary peliosis. JAMA 1993;269:770-775.

82. Weinstock HS, Bolan G, Reingold AL, Polish LB. Hepatitis C virus infection among patients attending a clinic for sexually transmitted diseases. JAMA 1993;269:392-394.

83. Yajko DM, Nassos PS, Sanders CA, Gonzalez PC, Reingold AL, et al. Comparison of four decontamination methods for recovery of Mycobacterium avium complex from stools. J Clin Micro, 1993;31:302-306.

84. Adams WG, Deaver KA, Cochi SL, Plikaytis BD, Zell ER, Broome CV, Wenger JD, and the *Haemophilus influenzae Study Group* (includes A.L. Reingold). Decline of childhood Haemophilus influenzae type b (Hib) disease in the Hib vaccine era. JAMA 1993;269:221-226.

85. Sutrisna B, Reingold AL, Kresno S, Harrison G, Utomo. Care-seeking for fatal illnesses in young children in Indramayu, West Java, Indonesia. Lancet 1993;342:787-789.

86. Sudarti K, Harrison GG, Sutrisna B, Reingold AL. Acute respiratory infection in children under five years in Indramayu, West Java, Indonesia: a rapid ethnographic assessment. Medical Anthropology. 1994;15:1-10.

87. Ley C, Olshen EM, Chin L, Reingold AL. The use of serologic tests for Lyme disease in a prepaid health plan in California. JAMA 1994;271:460-463.

88. Ley C, Davila I, Mayer N, Murray R, Reingold AL. Lyme disease in Northwestern coastal California. Western J Med, 1994;160:534-539.

89. Chin DP, Reingold AL, Stone EN, Vittinghoff E, Horsburgh Jr CR, et al. The impact of Mycobacterium avium complex bacteremia and its treatment on survival of AIDS patients-a prospective study. J Infect Dis 1994;170:578-584.

90. Horsburgh CR, Chin DP, Yajko DM, Hopewell PC, Reingold AL, et al. Environmental risk factors for acquisition of Mycobacterium avium complex in persons with human immunodeficiency virus infection. J Infect Dis 1994;170:362-367.

91. Chin DP, Reingold AL, Horsburgh CR, Yajko DM, et al. Predicting Mycobacterium avium complex bacteremia in patients with human immunodeficiency virus - a prospectively validated model. Clin Infect Dis 1994;19:668-674.

92. Chin DP, Hopewell PC, Yajko DM, Vittinghoff E, Horsburgh CR, Hadley WK, Stone EN, Nassos PS, Ostroff SM, Jacobson MA, Matkin CC, Reingold AL. Mycobacterium avium complex in the respiratory or gastrointestinal tract and the risk of M. avium complex bacteremia in patients with human immunodeficiency virus infection. J Infect Dis 1994;169:289-295.

93. Jackson LA, Tenover FC, Baker C, Plikaytis BD, Reeves MW, Stocker SA, Weaver RE, Wenger JD, and the *Meningococcal Disease Study Group* (includes A.L. Reingold). Prevalence of Neisseria meningitidis relatively resistant to penicillin in the United States, 1991. J Infect Dis 1994; 169:438-441.

94. Schuchat A, Deaver-Robinson K, Plikayatis BD, Zangwill KM, Mohle-Boetani J, Wenger JD, and the Active Surveillance Study Group (includes A.L. Reingold). Multistate case-control study of maternal risk factors for neonatal Group B streptococcal disease. Pediatric Infect Dis J 1994; 13:623-629.

95. Weinstock HS, Bolan G, Moran JS, Peterman TA, Polish L, Reingold AL. Routine hepatitis B immunization in a clinic for sexually transmitted diseases. AJPH 1995;85:846-849.

96. Wang F, So Y, Vittinghoff E, Malani H, Reingold A, et al. Incidence proportion of and risk factors for AIDS patients diagnosed with HIV dementia, central nervous system toxoplasmosis, and cryptococcal meningitis. J AIDS 1995;8:75-82.

97. Espinal M, Reingold AL, Koenig E, Lavandera M, Sanchez S. Screening for active tuberculosis in HIV testing centre. Lancet 1995;345:890-893.

98. Yajko DM, Chin DP, Gonzalez PC, Nassos PS, Hopewell PC, Reingold AL, et al. Mycobacterium avium complex in water, food, and soil samples collected from the environment of HIV-infected individuals. J AIDS 1995;9:176-182.

99. Lurie P, Fernandes M, Hughes V, Arevalo E, Hudes E, Reingold A, et al. Socioeconomic status and risk for HIV-1, syphilis and hepatitis B infection among sex workers in São Paulo State, Brazil. AIDS 1995 9(suppl 1):S31-S37.

100. Jackson L, Hilsdon R, Farley M, Harrison L, Reingold A, et al. Risk factors for Group B streptococcal disease in adults. Ann Int Med 1995;123:415-420.

101. Tappero J, Schuchat A, Deaver K, Mascola L, Wenger JD, and the *Listeriosis Study Group* (includes A.L. Reingold). Reduction in the incidence of human listeriosis in the United States – Effectiveness of prevention efforts? JAMA 1995;273:1118-1122.

102. Brandt ME, Hutwagner LC, Kuykendall RJ, Pinner RW, and *the Cryptococcal Disease Active Surveillance Group* (includes A.L. Reingold). Comparison of multilocus enzyme electrophoresis and random amplified polymorphic DNA analysis for molecular subtyping of Cryptococcus neoformans. J Clin Microbiol 1995:33:1890-1895.

103. Ley C, Olshen EM, Reingold AL. Case-control study of risk factors for incident Lyme disease in California. Am J Epi 1995:142; Suppl:S39-S47.

104. Espinal MA, Reingold AL, Lavandera M. Effect of pregnancy on the risk of developing active tuberculosis. J Inf Dis 1996;173:488-491.

105. Perkins BA, Flood JM, Danila R, Holman RC, Reingold AL, et al. Unexplained deaths due to possibly infectious causes in the United States: Defining the problem and design of surveillance and laboratory approaches. Emerg Inf Dis 1996;Vol 2:47-53.

106. Hessol NA, Priddy FH, Bolan G, Baumrind N, Vittinghoff E, Reingold AL, Padian NS. Management of pelvic inflammatory disease by primary care physicians: A comparison with Centers for Disease Control and Prevention guidelines. Sex Trans Dis 1996;Mar-Apr:157-163.

107. Mohle-Boetani JC, Koehler JE, Berger TG, LeBoit PE, Kemper CA, Reingold AL, et al. Bacillary angiomatosis and bacillary peliosis in patients infected with human immunodeficiency virus: Clinical characteristics in a case-control study. Clin Inf Dis 1996;22:794-800.

108. Espinal MA, Reingold AL, Pérez G, et al. Human immunodeficiency virus infection in children with tuberculosis in Santo Domingo, Dominican Republic: Prevalence, clinical findings, and response to antituberculosis treatment. J AIDS 1996;13:155-159.

109. Brandt ME, Hutwagner LC, Klug LA, Baughman WS, Rimland D, Graviss EA, Hamill RJ, Thomas C, Pappas PG, Reingold AL, et al. Molecular subtype distribution of Cryptococcus neoformans in four areas of the United States. J Clin Microbiol, 1996;34:912-917.

110. Bradford WZ, Martin JN, Reingold AL, et al. The changing epidemiology of acquired drug-resistant tuberculosis in San Francisco, USA. Lancet 1996;348:928-931.

111. Passaro DJ, Waring L, Armstrong R, Bolding F, Bouvier B, Rosenberg J, Reingold AL, et al. Beauty and the beast: Postoperative Serratia marcescens wound infections traced to an out-of-hospital source. J Inf Dis 1997;175:992-995.

112. Urwin G, Krohn JA, Deaver-Robinson K, Wenger JD, Farley MM, and the *Haemophilus influenzae Study Group* (includes A.L. Reingold). Invasive disease due to Haemophilus influenzae serotype f: Clinical and epidemiologic characteristics in the H. influenzae serotype b vaccine era. Clin Inf Dis, 1996;22:1069-76.

113. Sabino EC, Diaz RC, Brigido LF, Learn GH, Mullins JI, Reingold AL, et al. Distribution of HIV-1 subtypes seen in an AIDS clinic in São Paulo City, Brazil. AIDS 1996; 10:1579-1584.

114. Brandt ME, Pfaller MA, Hajjeh RA, Graviss EA, Rees J, Spitzer ED, Pinner RW, Mayer LW, and the *Cryptococcal Disease Active Surveillance Group* (includes A.L. Reingold). Molecular subtypes and antifungal susceptibilities of serial Cryptococcus neoformans isolates in human immunodeficiency virus - associated cryptococcosis. J Inf Dis 1996;174:812-820.

115. Whitney CG, Pllikaytis BD, Gozansky WS, Wenger JD, Schuchat A, and the *Neonatal Group B Streptococcal Disease Study Group* (includes A.L. Reingold). Prevention practices for perinatal group B streptococcal disease: A multi-site surveillance analysis. Obstet & Gyn 1997;89:28-32.

116. McFarland W, MvereD, Shandera W, Reingold A. The epidemiology and prevention of transfusion-associated Human Immunodeficiency Virus transmission in Sub-Saharan Africa. Vox Sanguinis 1997; 72:85-92.

117. Mazurek GH, Chin DP, Hartman S, Reddy V, Horsburgh Jr, CR, Green TA, Yajko DM, Hopewell PC, Reingold AL, et al. Genetic similarity among Mycobacterium avium isolates from blood, stool, and sputum of persons with AIDS. J Inf Dis 1997; 176:1-8.

118. DeRiemer K, Chin DP, Schecter GF, Reingold AL. Tuberculosis among immigrants and refugees. Arch Int Med, 1998; 158:753-760.

119. Schuchat A, Robinson K, Wenger JD, Harrison LH, Farley M, Reingold AL, et al. Bacterial meningitis in the United States in 1995. N Eng J Med 337:970-976, 1997.

120. Glaser CA, Safrin S, Reingold AL, Newman TB. The association between Cryptosporidium infection and animal exposure in HIV-infected individuals. J AIDS 17:79-82, 1998.

121. Reingold AL. Outbreak investigations: A perspective. Emerg Inf Dis 4:21-27, 1998.

122. Bradford WZ, Koehler J, El-Hajj H, Hopewell PC, Reingold AL, et al. Dissemination of Mycobacterium tuberculosis across the San Francisco Bay area. J Inf Dis 177:1104-1107, 1998.

123. Rees JR, Pinner RW, Hajjeh RA, Brandt ME, Reingold AL. The epidemiological features of invasive mycotic infections in the San Francisco Bay Area 1992-1993: Results of population-based laboratory active surveillance. Clin Inf Dis, 27:1138-1147, 1998.

124. Ragland DR, Buffler PA, Reingold AL, Syme SL, Winkelstein WW Jr, Buffler M. Disease and injury in California with projections to the year 2007: Implications for medical education. West J Med, 168:1-23, 1998.

125. Espinal MA, Báez J, Soriano G, Garcia V, Laszlo A, Reingold AL, Sanchez S. Drug-resistant tuberculosis in the Dominican Republic: Results of a nationwide survey. Int J Tuberc Lung Dis, 2:490-498, 1998.

126. Bindman AB, Osmond D, Hecht FM, Lehman S, Vranizan K, Keane D, Reingold A, et al. Multistate evaluation of anonymous HIV testing and access to medical care. JAMA, 280:1416-1420, 1998.

127. Bloch KC, Zwerling L, Pletcher MJ, Hahn JA, Gerberding JL, Ostroff SM, Vugia DJ, Reingold AL. Incidence and clinical implications of isolation of Mycobacterium kansasii: Results of a 5-year, population-based study. Ann Intern Med 129:698-704, 1998.

128. Hajjeh RA, Conn LA, Stephens DS, Baughman W, Hamill R, Graviss E, Pappas PG, Thomas C, Reingold AL, et al. Cryptococcosis: Population-based multistate active surveillance and risk factors in Human Immunodeficiency Virus-infected persons. J Inf Dis, 179:449-454, 1999.

129. DeRiemer K, Daley CL, Reingold AL. Preventing tuberculosis among HIV-infected persons: A survey of physicians' knowledge and practices. Prev Med, 28:437-444, 1999.

130. Jafari HS, Adams WG, Robinson KA, Plikaytis BD, Wenger JD, and the *Haemophilus influenzae Study Group*(includes A.L. Reingold). Efficacy of Haemophilus influenzae type b conjugate vaccines and persistence of disease in disadvantaged populations. AJPH, 89:364-368, 1999.

131. Fonseca LAM, Reingold AL, Casseb JR, Brigido LFM, Duarte AJS. AIDS incidence and survival in a hospital-based cohort of asymptomatic HIV seropositive patients in São Paulo, Brazil. J Inf Dis 28:1156-1160, 1999.

132. Reingold AL. Infectious disease epidemiology in the twenty-first century - will it be eradicated or will it re-emerge? Epi Reviews 22:57-63, 2000.

133. Reingold AL, Phares C. Communicable Diseases (chapter). In: Introduction to International Health (M. Merson, ed.).

134. Kao AS, Brandt ME, Pruitt WR, Conn LA, Perkins BA, Stephens DS, Baughman WS, Reingold AL, et al. The epidemiology of candidemia in two United States cities: Results of a population-based active surveillance. Clin Inf Dis 29:1164-1170, 1999.

135. Rosenstein NE, Perkins BA, Stephens D, Lefkowitz L, Cartter M, Danila R, Cieslak P, Shutt KA, Popovic T, Schuchat A, Harrison LH, Reingold AL, et al. The changing epidemiology of meningococcal disease in the United States, 1992-1996. J Inf Dis, 180:1894-1901, 1999.

136. Hajjeh RA, Reingold AL, Weil A, Shutt K, Schuchat A, Perkins BA. Toxic shock syndrome in the United States: Surveillance update, 1979-1996. Emerg Inf Dis J 5:807-810, 1999.

137. Osmond DH, Bindman AB, Vranizan K, Lehman JS, Hecht FM, Keane D, Reingold AL. Name-based surveillance and public health interventions for persons with HIV infection. Ann Int Med 131:775-779, 1999.

138. Kahane SM, Watt JP, Smith NJ, Wight S, Reingold AL, Newell K, et al. Immunization levels and risk factors for low immunization coverage among private practices. Pediatrics, 2000;105:73-.

139. Espinal MA, Pérez EN, Báez J, Henriquez L, Fernandez K, Lopez M, Olivo P, Reingold AL. Infectiousness of Mycobacterium tuberculosis in HIV-1-infected subjects with tuberculosis: A prospective study. Lancet 355:275-280, 2000.

140. Baer JT, Vugia DJ, Reingold AL, Aragon T, Angulo FJ, Bradford WZ. HIV infection as a risk factor for shigellosis. Emerg Inf Dis 6:820-823, 1999.

141. Schrag SJ, Zywicki S, Farley M, Reingold AL, et al. Group B streptococcal disease in the era of intrapartum antibiotic prophylaxis. New Eng J Med 342:15-20, 2000.

142. Nuorti JP, Butler JC, Gelling L, Kool JL, Reingold AL, et al. Epidemiologic relation between HIV and invasive pneumococcal disease in San Francisco County, California. Ann Int Med 132: 182-190, 2000.

143. Hecht FM, Chesney MA, Lehman JS, Osmond D, Vranizan K, Colman S, Keane D, Reingold A, et al. Does HIV reporting by name deter testing? AIDS 14:1801-1808, 2000.

144. Breiman RF, Keller DW, Phelan MA, Sniadack DH, Stephens DS, Rimland D, Farley MM, Schuchat A, Reingold AL. Evaluation of effectiveness of the 23-valent pneumococcal capsular polysaccharide vaccine for HIV-infected patients. Arch Int Med 160:2633-2638, 2000.

145. Whitney CG, Farley MM, Hadler J, Harrison LH, Lexau C, Reingold A, Lefkowitz L, et al. Increasing prevalence of multi-drug resistant Streptococcus pneumoniae in the United States. N Engl J Med 343:1917-1924, 2000.

146. Robinson KA, Baughman W, Rothrock G, Barrett NL, Pass M, Lexau C, Damske B, Stefonek K, Barnes B, Patterson J, Zell ER, Schuchat A, Whitney CG for the Active Bacterial Core Surveillance (ABCs)/Emerging Infections Program Network (includes Arthur L. Reingold, MD). Epidemiology of invasive Streptococcus pneumoniae Infections in the United States, 1995-1998: Opportunities for prevention in the conjugate vaccine era. JAMA 285:1729-1735, 2001.

147. Rosenstein NE, Emery KW, Werner SB, Kao A, Johnson R, Rogers D, Vugia D, Reingold A, Talbot R, et. al. Risk factors for severe pulmonary and disseminated coccidioidomycosis: Kern County, California, 1995-1996. Clin Inf Dis 32:708-715, 2001.

148. Kellam S, Pascopella L, Desmond E, Reingold A, Chin DP. Use of recommended laboratory testing methods among patients with tuberculosis in California. J Clin Micro 39:1969-1971, 2001.

149. Huang SS, Labus BJ, Samuel MC, Wan DT, Reingold AL. Antibiotic resistance patterns of bacterial isolates from blood in San Francisco county, 1996-1999. Emerg Inf Dis, 2002; 8:195-201.

150. Mesquita F, Kral A, Reingold A, Bueno R, Trigueiros D, Araujo PJ, and the SMR Collaborative Study Group. Trends of HIV infection among injecting drug users in Brazil in the 1990's - the impact of changes in patterns of drug use. J AIDS, 2001; 28:298-302.

151. Mesquita F, Kral A, Reingold A, Haddad I, Sanches M, Turienzo G, Piconez D, Araujo P, Bueno R. Overdoses among cocaine users in Brazil. Addiction, 2001; 96:1809-1813.

152. Alpers L, Chrouser K, Halabi S, Moeti T, Reingold A, Binkin N, Kenyon T. Validation of the surveillance system for tuberculosis in Botswana. Int J Tuberc Lung Dis, 2000; 4:737-743.

153. Hajjeh RA, Relman D, Cieslak PR, Sofair AN, Passaro D, Flood J, et al. and the Critical Illness Working Group (includes Reingold, AL.). Surveillance for unexplained deaths and critical illnesses due to possibly infectious causes, United States, 1995-1998. Emerg Inf Dis, 2002;8:145-153.

154. Larson JI, Ridzon R, Hannan MM, Conde MB, Mello FCQ, Reingold AL, Daley CL, Kritski AL. Sputum induction vs. fiberoptic bronchoscopy in the diagnosis of tuberculosis. Am J Respir Crit Care Med, 2001;163:1279-1280.

155. Conde MB, Loivos AC, Rezende VM, Soares SLM, Mello FCQ, Reingold AL, Daley CL, Kritski AL. The yield of sputum induction in the diagnosis of pleural tuberculosis. Am J Respir and Crit Care Med, 2002; 167:723-725.

156. Handley MA, Reingold AL, Shiboski S, Padian NS. Incidence of acute urinary tract infection in young women and use of male condoms with and without nonoxynol-9 spermicides. Epidemiology, 2002;13:431-436.

157. Hyde TB, Hilger TM, Reingold A, Farley MM, O'Brien KL, Schuchat A. for the Active Bacterial Core surveillance (ABCs) of the Emerging Infections Program Network. Trends in the incidence and antimicrobial resistance of early-onset sepsis: Population-based surveillance in San Francisco and Atlanta. Pediatrics, 2002;110:690-695.

158. Schrag SJ, Zell ER, Lynfield R, Roome A, Arnold KE, Craig A, Harrison L, Reingold A, Stefonek K, Smith G, Gamble M, Schuchat A for the Active Bacterial Core Surveillance team. A population-based comparison of strategies to prevent early-onset group B streptococcal disease in neonates. New Engl J Med 2002;347:233-239.

159. Schuchat A, Hilger T, Zell E, Farley MM, Reingold A, Harrison L, Lefkowitz L, Danila R, Stefonek K, Barrett N, Morse D, Pinner R. Active bacterial core surveillance of the Emerging Infections Program network. Emerg Inf Dis, 2001; 7:92-99.

160. O'Brien KL, Beall B, Barrett NL, Cieslak P, Reingold A, Farley MM, Danila R, Zell ER, Facklam R, Schwartz B, Schuchat A for the Active Bacterial Core Surveillance team. Epidemiology of invasive group A streptococcus disease in the United States, 1995-1999. Clin Infect Dis, 2002;35:268-276.

161. Morita JY, Zell ER, Danila R, Farley MM, Hadler JH, Harrison LH, Lefkowitz L, Reingold A, Kupronis B, Schuchat A, Whitney CG. Association between antimicrobial resistance among pneumococcal isolates and burden of invasive pneumococcal disease in the community. Clin Infect Dis, 2002;35:420-427.

162. Chuang I, Van Beneden C, Beall B, Schuchat A. and the ABCs/EIP network (includes Reingold, A.). Population-based surveillance for postpartum invasive group A streptococcal Infections, 1995-2000. Clin Infect Dis, 2002;35:665-670.

163. Factor SH, Whitney CG, Zywicki S, Schuchat A. for the ABC Surveillance Team (includes Reingold, A.). Effects of hospital policies on the 1996 group B streptococcal consensus guidelines. Obstet Gynecol 2000; 95:377-382.

164. Passaro DJ, Smith DS, Hett EC, Reingold AL, Daily P, Van Beneden CA, Vugia DJ. Invasive Group A Streptococcal infections in the San Francisco Bay Area, 1989-1999. Epi&Infect, 2002; 129:471-478.

165. McCormick AW, Whitney CG, Farley MM, Lynfield R, Harrison LH, Bennett NM, Schaffner W, Reingold A, Hadler J, et al. Geographic diversity and temporal trends of antimicrobial resistance in *Streptococcus pneumoniae* in the United States. Nature Med 2003;doi:10.1038/nm839.

166. Whitney CG, Farley MM, Hadler J, Harrison LH, Bennett NM, Lynfield R, Reingold A, Cieslak PR, Pilishvili T, et al. Decline in invasive pneumococcal disease after the introduction of protein-polysaccharide conjugate vaccine. N Engl J Med 2003;348:1737-1746.

167. Reingold A. If syndromic surveillance is the answer, what is the question? Biosecurity & Bioterrorism: Biodefense Strategy, Science, and Practice. 2003;1:1-5.

168. Brandt ME, Pfaller MA, Hajjeh RA, Hamill RJ, Pappas PG, Reingold AL, Rimland D, et al. Trends in antifungal drug susceptibility of Cryptococcus neoformans isolates in the United States: 1992 to 1994 and 1996 to 1998. Antimicrobial Agents and Chemotherapy 2001;45:3065-3069.

169. Koehler JE, Sanchez MA, Tye S, Garrido-Rowland CS, Chen FM, Maurer T, Cooper JL, Olson JG, Reingold AL, Hadley WK, Regnery RR, Tappero JW. Prevalence of Bartonella infection among HIV-infected patients with fever. Clin Inf Dis 2003;37:559-566.

170. Factor SF, Whitney CG, Zywicki SS, Schuchat A, Active Bacterial Core Surveillance Team (includes Reingold, AL). Effects of hospital policies based on 1996 group B streptococcal disease consensus guidelines. Hospital Policies 2000; 95:377-382.

171. Schrag SJ, Arnorld KE, Mohle-Boetani JC, Lynfield R, Zell ER, Stefonek K, Noga H, Craig AS, Thomson Sanza L, Smith G, Schuchat A, Active Bacterial Core Surveillance Team (includes Reingold AL). Prenatal screening for infectious diseases and opportunities for prevention. Obstet Gynecol 2003;102:753-760.

172. King MD, Whitney CG, Parekh F, Farley MM, Active Bacterial Core Surveillance Team/Emerging Infections Program Network (includes Reingold AL). Recurrent invasive pneumococcal disease: A population-based assessment. Clin Inf Dis 2003;37:1029-1036.

173. Carvalho HB, Seibel SD, Burattini MN, Massad E, Reingold A. Hepatitis B and C and Syphilis: Vulnerability Related Infections among Institutionalized Disadvantaged Youth in São Paulo, Brazil. J Bras Doenças Sex Transm 2003;15:41-45.

174. Louie JK, Hacker JK, Mark J, Gavali SS, Yagi S, Espinosa A, Schnurr D, Cossen CK, Isaacson ER, Glaser CA, Fischer M, Reingold AL, Vugia DJ. SARS and common viral infections, Emerg Inf Dis, 2004;10:1143-1146.

175. Flanders SA, Stein J, Shochat G, Sellers K, Holland M, Maselli J, Drew WL, Reingold AL, Gonzales. Performance of a bedside c-reactive protein test in the diagnosis of community-acquired pneumonia in adults with acute cough. Amer J Med 2004;116:529-535.

176. Pascopella L, Kellam S, Ridderhof J, Chin DP, Reingold A, Desmond E, Flood J, Royce S. Laboratory reporting of tuberculosis test results and patient treatment initiation in California. J Clin Micro, 2004;42:4209-4213.

177. Nicas M, Hubbard AE, Jones RM, Reingold AL. The infectious dose of variola (smallpox) virus. Appl Biosafety 2004;9:118-127.

178. Flannery B, Schrag S, Bennett NM, Lynfield R, Harrison LH, Reingold A, Cieslak PR, Hadler J, Farley MM, Facklam RR, Zell ER, Whiteney CG. Impact of childhood vaccination on racial disparities in invasive Streptococcus pneumoniae infections. JAMA, 2004;291:2197-2203.

179. Facklam R, Elliott J, Shewmaker L, Reingold A. Identification and characterization of sporadic isolates of Streptococcus iniae isolated from human infections. J Clin Micro 2005; 43:933-937.

180. Heffernan RT, Barrett NL, Gallagher KM, Hadler JL, Harrison LH, Reingold AL, Khoshnood K, Holford TR, Schuchat A. Declining incidence of invasive Streptococcus pneumoniae infections among persons living with AIDS in an era of highly-active antiretroviral therapy (HAART), 1995-2000. J Inf Dis, 2005;191:2038-2045.

181. Bakyaita N, Dorsey G, Yeka A, Banek K, Staedke SG, Kamya MR, Talisuna A, Kironde F, Nsobya S, Kilian A, Reingold A, Rosenthal PJ, Wabwire-Mangen F. Sulfadoxine-pyrimethamine plus chloroquine or amodiaquine for uncomplicated falciparum malaria: A randomized, multisite trial to guide national policy in Uganda. Am J Trop Med Hyg 2005;72:573-580.

182. Pai M, Gokhale K, Joshi R, Dogra S, Kalantri SP, Mendiratta DK, Narang P, Daley CL, Granich RM, Mazurek GH, Reingold AL, Riley LW, Colford Jr, JM. Mycobacterium tuberculosis infection in health care worker in rural India: Comparison of whole-blood interferon ϒ assay with tuberculin skin testing. JAMA 2005;293:2746-2755.

183. Pai M, Kalantri S, Pascopella L, Riley LW, Reingold AL. Bacteriophage-based assays for the rapid detection of rifampicin resistance in Mycobacterium tuberculosis: a meta-analysis. Journal of Infection 2005;51:175-187.

184. Lexau CA, Lynfield R, Danila R, Pilishvili T, Facklam R, Farley MM, Harrison LH, Schaffner W, Reingold AL, Bennett NM, Hadler J, Cieslak PR, Whiteny CG (for the Active Bacterial Core Surveillance Team). Changing epidemiology of invasive pneumococcal disease among older adults in the era of pediatric pneumococcal conjugate vaccine. JAMA 2005;294:2043-2051.

185. Flannery B, Heffernan RT, Harrison LH, Ray SM, Reingold AL, Hadler J, Schaffner W, Lynfield R, Thomas AR, Jianmin Li DPE, Campsmith DDS, Whitney CG, Schuchat A. Changes in invasive pneumococcal disease among HIV-infected adults living in the era of childhood pneumococcal immunization. Ann Int Med 2006; 144:1-9.

186. Kalantri S, Pai M, Pascopella L, Riley L, Reingold A. Bacteriophage-based tests for the detection of Mycobacterium tuberculosis in clinical specimens: a systematic review and meta-analysis. BMC Inf Dis 2005;5:59; doi:10.1186/1471-2334-5-59.

187. Dogra S, Narang P, Mendiratta DK, Chaturvedi P, Reingold AL, Colford JM, Riley LW, Pai M. Comparison of a whole blood interfon-γ assay with tuberculin skin testing for the detection of tuberculosis infection in hospitalized children in rural India. J Inf 2006; in press.

188. Pai M, Joshi R, Dogra S, Mendiratta DK, Narang P, Kalantri S, Reingold AL, Colford JM Jr, Riley LW, Menzies D. Serial testing of health care workers for tuberculosis using interferon-γ assay. Amer J Resp Crit Care Med 2006;doi:10.1164/rccm.200604-4720C.

189. Kyaw MH, Lynfield R, Schaffner W, Craig AS, Hadler J, Reingold A, Thomas AR, Harrison LH, et al. Effect of introduction of the pneumococcal conjugate vaccine on drug-resistant Streptococcus pneumoniae. New Eng J Med 2006;354:1455-1463.

190. Poehling KA, Talbot TR, Griffin MR, Craig AS, Whitney CG, Zell E, Lexau CA, Thomas AR, Harrison LH, Reingold AL, Hadler JL, et al. Invasive pneumococcal disease among infants before and after introduction of pneumococcal conjugate vaccine. JAMA 2006;295:1668-1674.

191. Jones RM, Nicas M, Hubbard AE, Reingold AL. The infectious dose of Coxiella burnetii (Q Fever). Appl Biosafety 2006;11:32-41.

192. Whitney CG, Pilishvili T, Farley MM, Schaffner W, Craig AS, Lynfield R, Nyquist A-C, Gershman K, Vazquez M, Bennett NM, Reingold A, Thomas A, et al. Effectiveness of seven-valent pneumococcal conjugate vaccine against invasive pneumococcal disease: a matched case-control study. Lancet 2006; 368:1495-1502.

193. Feikin DR, Klugman KP, Facklam RR, Zell ER, Schuchat A, Whitney CA for the Active Bacterial Core surveillance/Emerging Infections Program Network (includes Reingold AL). Increased prevalence of pediatric pneumococcal serotypes in elderly adults. Clin Inf Dis 2005;41:481-487.

194. Tappero JW, Bradford WZ, Agerton TB, Hopewell P, Reingold AL, Lockman S, Oyewo A, Talbot EA, et al. Serum concentrations of antimycobacterial drugs in patients with pulmonary tuberculosis in Botswana. Clin Inf Dis 2005'41:461-469.

195. Kyaw MH, Rose CE, Fry AM, Singleton JA, Moore Z, Zell ER, Whitney CG for the Active Bacterial Core surveillance program of the Emerging Infections Program Network (includes Reingold AL). The influence of chronic illnesses on the incidence of invasive pneumococcal diseases in adults. J Inf Dis 2005;192:377-386.

196. Hwang J, Bitarakwate E, Pai M, Reingold A, Rosenthal PJ, Dorsey G. Chloroquine or amodiaquine combined with sulfadoxine-pyrimethamine for uncomplicated malaria: a systematic review. Trop Med & Int Hlth 2006;11:789-799.

197. Joshi R, Reingold AL, Menzies D, Pai M. Tuberculosis among health-care workers in low- and middle-income countries: A systematic review. PLoS Med 3(12):e494. Doi:10.1371/journal.pmed. 0030494

198. Aragón TJ, Vugia DJ, Shallow S, Samuel MC, Reingold A, Angulo FJ, Bradford WZ. Case-control study of shigellosis in San Francisco: The role of sexual transmission and HIV infection. Clin Inf Dis 2007;44:327-334.

199. Pai N, Peterson Tulsky J, Cohan D, Colford Jr JM, Reingold AL. Rapid point-of-care HIV testing in pregnant women: A systematic review and meta-analysis. Trop Med and Int Hlth 2007;12:1-12.

200. Chainani-Wu N, Silverman Jr S, Reingold A, Bostrom A, McCulloch C, Lozada-Nur F, Weintraub J. A randomized, placebo-controlled, double-blind clinical trial of curcuminoids in oral lichen planus. Phytomed 2007;14:437-446.

201. Veras Maria Ameli SM, Enanoria WTA, Castilho EA, Reingold AL. Effectiveness of the polysaccharide pneumococcal vaccine among HIV-infected persons in Brazil: A case control study. BMC Inf Dis 2007;7:119.

202. Krupp K, Madhivanan P, Karat C, Chandrasekaran V, Sarvode M, Klausner J, Reingold A. Novel recruitment strategies to increase participation of women in reproductive health research in India. Glob Pub Hlth 2007;4:395-403.

203. Lippman SA, Pulerwitz J, Chinaglia M, Hubbard A, Reingold AL, Diaz J. Mobility and its liminal context: Exploring sexual partnering among truck drivers crossing the Southern Brazilian border. Soc Sci & Med 2007;doi:10.1016.

204. Hicks LA, Harrison LH, Flannery B, Hadler JL, Schaffner W, Craig AS, Jackson D, Thomas A, Beall B, Lynfield R, Reingold AL, Farley MM, et al. Incidence of pneumococcal disease due to non-pneumococcal conjugate vaccine (PCV7) serotypes in the United States during the era of widespread PCV7 vaccination, 1998-2004. J Inf Dis 2007;196:1346-1354.

205. O'Loughlin RE, Roberson A, Cieslak PR, Lynfield R, Gershman K, Craig A, Albanese BA, Farley MM, Barrett NL, Spina NL, Beall B, Harrison LH, Reingold AL, Van Beneden C, et al. The epidemiology of invasive group A streptococcal infection and potential vaccine implications: United States, 2000-2004. Clin Inf Dis 2007;45:853-862.

206. Thigpen MC, Richards Jr CL, Lynfield R, Barrett NL, Harrison LH, Arnold KE, Reingold A, Bennett NM, et al. Invasive group A streptococcal infection in older adults in long-term care facilities and the community, United States, 1998-2003. Emerg Inf Dis 13:1852-1859.

207. Koo D, Birkhead GS, Reingold AL. Guest editorial. Pub Hlth Rep 2008 (Suppl 1);123:1-3.

208. Malamba S, Hladik W, Reingold AL, Banage F, McFarland W, Rutherford G, Mimbe D, Nzaro E, Downing R, Mermin J. The effect of HIV on morbidity and mortality in children with severe malarial anaemia. Malaria J 2007;6:143.

209. Joshi R, Colford Jr JM, Reingold AL, Kalantri S. Nonmalarial acute undifferentiated fever in a rural hospital in Central India: Diagnostic uncertainty and overtreatment with anti-malarial agents. Am J Trop Med Hyg 2008;78:393-399.

EXHIBIT B

Bureau of Justice Statistics
Data Brief

January 2007, NCJ 216340

Medical Causes of Death in State Prisons, 2001-2004

by Christopher J. Mumola
BJS Policy Analyst

Between 2001 and 2004, State prison authorities nationwide reported a total of 12,129 State prisoner deaths to the Deaths in Custody Reporting Program (DCRP).* Nearly 9 in 10 of these deaths (89%) were attributed to medical conditions. Fewer than 1 in 10 were the result of suicide (6%) and homicide (2%), while alcohol/drug intoxication and accidental injury accounted for another 1% each. A definitive cause could not be determined for 1% of these deaths.

This information was obtained from individual death records collected under the *Death in Custody Reporting Act of 2000* (PL 106-297). These records provide the first national data on personal characteristics of inmates who died in custody and the circumstances of the deaths. Detailed data tables on the topics covered in this report are available as appendix tables on the BJS website at <www.ojp.usdoj.gov/bjs/abstract/mcdsp04.htm>.

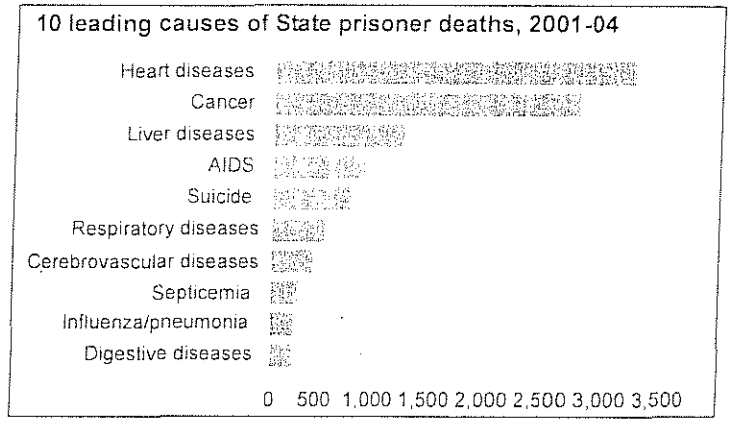
Among State prisoner deaths —

- Half were the result of heart diseases and cancer
- Two-thirds involved inmates age 45 or older
- Two-thirds were the result of medical problems which were present at the time of admission
- 40% occurred in 5 States (Texas, California, Florida, New York, and Pennsylvania)
- Over 90% were evaluated by medical staff for the fatal illness; 93% received medications for the illness.

Comparative mortality rates showed —

- Male State prisoners had a death rate 72% higher than female State prisoners
- State prisoners had a 19% lower death rate than the adult U.S. resident population; among blacks, the mortality rate was 57% lower among prisoners.

*Total number of deaths excludes 258 State prison executions during 2001-2004. See *Capital Punishment, 2005* <http://www.ojp.usdoj.gov/bjs/abstract/cp05.htm>.



Heart diseases and cancer accounted for half of all State prison deaths

Correctional authorities reported over 60 different fatal medical conditions, but prisoner deaths were heavily concentrated among a small number of diseases. Heart diseases (27%), including heart attacks, and cancer (23%) caused half of all State prisoner deaths from 2001 to 2004. When combined with liver diseases (10%) and AIDS-related causes (7%), two-thirds of all State prisoner deaths were caused by these four medical conditions.

Death rates higher among men than women in 9 of the 10 leading causes of death

While the leading causes of death were the same for both men and women in State prisons, men died at a much higher rate than women. The mortality rate of men for all causes of death (257 deaths per 100,000 inmates) was 72% higher than that of women (149 deaths per 100,000 inmates). For the top three causes of death (heart diseases, cancer, and liver diseases), the male death rate was twice the female rate. Septicemia (for example, streptococcal and staphylococcal infection) was the lone cause of death that was higher among female State prisoners (10 deaths per 100,000) than male State prisoners (5 per 100,000).

Black and Hispanic inmate mortality rates identical; white inmates 67% higher

Between 2001 and 2004 the mortality rates of black and Hispanic State prisoners were identical (206 deaths per 100,000 inmates), while the rate for white inmates (343 per 100,000) was 67% higher. For heart diseases and cancer, the mortality rate of whites was nearly twice that of blacks and Hispanics. Despite higher mortality rates for most leading causes of death, white inmates had a lower AIDS-related death rate (10 per 100,000) than black (26 per 100,000) and Hispanic (18 per 100,000) State prisoners.

Two-thirds of State prison deaths involved inmates age 45 or older

Mortality rates rose dramatically with age. The death rate of inmates age 55 and older (1,973 per 100,000) was over 3 times higher than that of inmates age 45-54 (566 per 100,000), and 11 times higher than those age 35-44 (177 per 100,000). Inmates age 45 or older comprised 14% of State prisoners from 2001 to 2004, but accounted for 67% of all inmate deaths over the same period.

Unlike the leading fatal illnesses, suicide rates were stable across all adult age groups. While suicide was the leading cause of death for inmates under the age of 35, it fell far behind several illnesses as a cause of death for older inmates. Among inmates age 55 or older, there were 46 heart disease deaths and 42 cancer deaths for each suicide.

	Average annual mortality rate, per 100,000 State prisoners, by age			
Cause of death	25-34	35-44	45-54	55 or older
Leading illnesses				
Heart diseases	11	41	144	689
Cancer	5	28	135	635
Liver diseases	2	19	96	126
Respiratory diseases	2	5	18	107
Suicide	16	14	15	15

Note: Respiratory diseases exclude influenza and pneumonia.

Among deaths of elderly State prisoners, 85% were 45 or older when admitted

Among older inmates, the mortality rate of those age 65 or older was particularly high. Though these elderly inmates made up 1% of prisoners, they accounted for 15% of prisoner deaths. The mortality rate of elderly prisoners was nearly 3 times higher than that of inmates age 55-64. The death rate for aortic aneurysm was 6 times higher among elderly inmates than those age 55-64; for respiratory diseases, the rate was 5 times higher.

Deaths of elderly inmates typically did not involve offenders who had been incarcerated as young adults on lengthy (or "life") sentences. A majority (59%) of the elderly State prisoners who died during this period were 55 or older when admitted, and 85% were at least 45 years old at time of admission.

Death from illness increased with time served in prison

The death rate from illness rose sharply for prisoners serving lengthy terms. For inmates who had served at least 10 years in State prison, the mortality rate due to illness (503 deaths per 100,000 inmates) was triple that of inmates who had served less than 5 years in prison (162 per 100,000) Long-serving inmates showed similar increases in death rates for many of the leading fatal illnesses. AIDS-related causes had the smallest increase in mortality for long-serving inmates.

	Average annual mortality rate per 100,000 State prisoners, by time served		
Cause of death	Less than 60 mos.	60-119 mos.	120 mos. or longer
Heart diseases	47	84	160
Cancer	38	70	151
Liver diseases	20	31	48
AIDS-related	16	21	24
Respiratory diseases	7	13	38

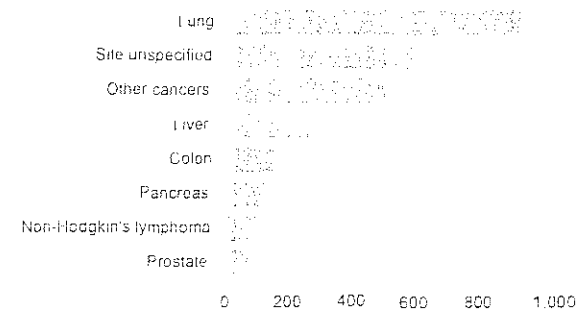
Lung cancer accounted for 1 in 3 cancer deaths in State prison, more than the next 6 leading cancer sites combined

A specific cancer site was named in 79% of the cancer deaths. Lung cancer alone accounted for 8% of all State prisoner deaths. More State prisoner deaths were caused by lung cancer (910) than the next 6 leading sites of cancer deaths (864) combined (i.e., liver, colon, pancreas, non-Hodgkins lymphoma, prostate, and leukemia).

Men in State prison died from cancer at twice the rate of women (60 deaths per 100,000 inmates compared to 27 per 100,000). This gender difference in cancer death rates was particularly evident for the most common fatal cancer sites. Men died from lung, liver and colon cancer at a rate nearly triple that of women. Regardless of gender, lung cancer caused twice as many deaths as any other site.

Deaths due to gender-specific cancer sites varied. Breast, ovarian, cervical and uterine cancer accounted for 24% of female cancer deaths. By comparison, prostate and testicular cancer accounted for 4% of male cancer deaths. Breast cancer was also the second most common site of female cancer deaths.

Cancer deaths in State prisons, 2001-04



Time served in prison played little role in the death rate due to communicable diseases

Death rates from communicable diseases (other than AIDS) were much lower than those for the leading fatal illnesses, and did not show the same increases among long-serving inmates. There were no deaths in State prisons nationwide from syphilis, meningitis, or meningococcal infection. The death rate from tuberculosis was lower than 0.5 per 100,000 for all inmates, regardless of time served. The death rate for viral hepatitis (all types) was 1 per 100,000 for inmates who served less than 5 years and rose to 3 per 100,000 for inmates who served longer than 5 years.

Two-thirds of illness deaths resulted from pre-existing conditions — including 94% of AIDS deaths

In 68% of the illness deaths, State prison authorities reported that the fatal medical condition was present at the time of admission. AIDS (94%)* and liver diseases (88%) were most commonly present at the time of admission. Cancer was present at admission in 54% of all cancer fatalities. Among leading causes of death, influenza or pneumonia was least likely to be present at time of admission (39%).

In 93% of deaths from illness, medical staff had provided medications for the fatal condition

Among illness fatalities, 94% were evaluated by medical staff prior to death. Diagnostic tests, such as an x-ray, MRI, or blood test, were performed in 89% of these cases. For 93% of illness fatalities, medications had been administered for the fatal medical condition.

Surgery had been performed on 1 in 5 inmates who died from illness. Among deaths from leading causes, prisoners who died from septicemia were most likely to have received surgical treatments (35%), followed by those who had cancer and digestive diseases (31% each). Fatalities from AIDS (11%) and heart diseases (15%) were least likely to have had surgery.

*It is not known how many of the remaining 6% of AIDS-related deaths involved inmates whose HIV-positive status was undetected at time of admission and how many contracted HIV during their prison term.

Over 40% of prisoner deaths took place in 5 States; mortality rates varied widely across States

Five States each recorded over 500 prisoner deaths from 2001 to 2004. Texas led all States with 1,582 deaths, followed by California (1,306), Florida (813), New York (712), and Pennsylvania (558). These five States accounted for 41% of all State prisoner deaths during the 4-year period.

Illness mortality rates varied widely across States. Five States had more than 300 illness deaths per 100,000 inmates, while 10 States had fewer than 150 illness deaths per 100,000 inmates.

Illness mortality rate per 100,000 State inmates, 2001-2004

Five highest		Five lowest	
Louisiana	388	Vermont	108
Tennessee	344	Alaska	111
Pennsylvania	328	Iowa	111
West Virginia	326	North Dakota	116
Kentucky	323	Utah	116

Specific medical causes of death also varied widely across States:

- Heart disease death rates varied from 10 per 100,000 in New Hampshire to 189 per 100,000 in West Virginia
- Cancer death rates ranged from 0 in Vermont to 103 per 100,000 in Louisiana
- Liver disease death rates varied from 0 in Rhode Island to 58 per 100,000 in Colorado.

Mortality rate in State prisons nearly 20% lower than in U.S. resident population

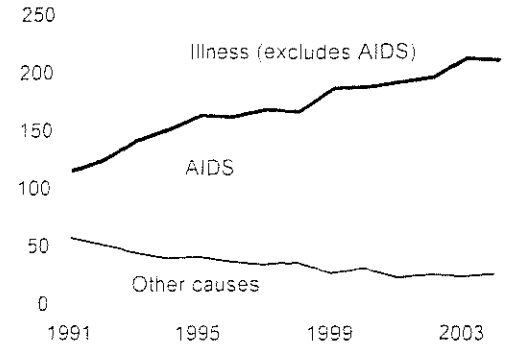
From 2001 to 2004, 99% of State prisoners were between ages 15 and 64. When compared to mortality rates for U.S. residents in this age group, the overall mortality rate of State prisoners was 19% lower during this period. White and Hispanic prisoners had death rates slightly above their counterparts in the resident population, while blacks were 57% less likely to die in State prisons. For all age groups under the age of 45, the death rate in State prisons was lower than in the U.S. resident population. For the 55 to 64 age group, prison death rates were 56% higher.

Since 1991, AIDS-related death rate dropped 84%; death rate for all other illnesses rose 82%

Prior to the enactment of the *Death in Custody Reporting Act of 2000*, the only national statistics on prisoner deaths from specific illnesses were annual counts of AIDS-related deaths begun in 1991. Between 1991 and 2004, sharply different trends emerged for the major causes of State prison deaths. While the death rate for AIDS dropped by over 80%, the death rate from all other illnesses rose by 82%. Over the same period, the suicide rate was nearly stable and homicide rates dropped by one-half.*

*See *Suicide and Homicide in State Prisons and Local Jails* <http://www ojp.usdoj.gov/bjs/abstract/shsplj.htm>.

Mortality rate per 100,000 State prisoners, 1991-2004



U.S. Department of Justice
Office of Justice Programs
Bureau of Justice Statistics

Washington, DC 20531

Methodology

In 2001 BJS began collecting individual records of all State prisoner deaths pursuant to PL 106-297. Prior to the collection of these records, BJS collected aggregate death counts in the National Prisoners Statistics (NPS) program. Since 1978 NPS counts have used a single category of "illness/natural causes," with AIDS-related deaths collected as a separate count from all other illnesses starting in 1991.

Records collected under the Deaths in Custody Reporting Program (DCRP) were submitted by correctional authorities in all 50 States for each year from 2001 to 2004. For each death marked as illness/natural cause, respondents were directed to specify a medical cause of death based on an autopsy review, if available.

These text entries were later coded by clinical data specialists according to the World Health Organization's *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (ICD-10). BJS analysis of causes of death used categories of disease published by the National Center for Health Statistics (NCHS). See the NCHS website for mortality data for the U.S. resident population at <http://www.cdc.gov/nchs/deaths.htm>.

In compiling their DCRP records, States are instructed to include deaths of any inmates held in private prisons, medical facilities, substance abuse or mental health treatment centers, or any deaths at a work release site. Deaths of State prisoners held in local jails are excluded, but covered by a separate collection. Also excluded are executions and escaped inmates.

This report in portable document format and in ASCII and its related statistical data and tables are available at the BJS World Wide Web Internet site: <http://www.ojp.usdoj.gov/bjs/abstract/mcdsp04.htm>.

Office of Justice Programs

Partnerships for Safer Communities
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The Bureau of Justice Statistics is the statistical agency of the U.S. Department of Justice. Jeffrey L. Sedgwick is director.

This Data Brief was written by Christopher J. Mumola, under the supervision of Allen J. Beck. Margaret E. Noonan verified the report.

Data collection and processing of 2001-2002 death records were carried out by Lara E. Allen; data collection and processing of 2003-2004 death records were carried out by Greta B. Clark and Pamela Butler, under the supervision of Charlene Sebold, Governments Division, Census Bureau, U.S. Department of Commerce. Greg Wolfe, of GW Services, converted all death causes from text to ICD-10 codes.

Carolyn C. Williams and Tina Dorsey of BJS produced and edited the report and Jayne Robinson prepared the report for final printing, under the supervision of Doris J. James.

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Appendix table 1. Causes of death in State prisons, with average annual mortality rate per 100,000 inmates, 2001-2004

Cause of death	Number of State prisoner deaths 2001	2002	2003	2004	Percent, 2001-04	Average annual mortality rate, per 100,000 inmates, 2001-04
All causes	2,878	2,946	3,167	3,138	100.0%	250
Heart diseases	788	828	836	862	27.3%	68
Cancer	655	660	786	719	23.3	58
Liver diseases	320	301	315	294	10.1	25
Chronic liver disease/cirrhosis	89	88	78	84	2.8	7
Other liver diseases	231	213	237	210	7.3	18
AIDS	270	245	210	145	7.2	18
Suicide	169	168	200	200	6.1	15
Respiratory diseases[a]	97	125	130	143	4.1	10
Chronic lower respiratory diseases	31	35	39	57	1.3	3
Lung diseases due to external agents	2	2	2	2	0.1	0
Other/unspecified respiratory diseases	64	88	89	84	2.7	7
Cerebrovascular diseases	93	90	122	89	3.2	8
Septicemia	50	64	67	81	2.2	5
Influenza/pneumonia	47	47	74	57	1.9	5
Digestive diseases[b]	40	61	56	49	1.7	4
Disorders of the gall bladder, biliary tract & pancreas	7	5	8	5	0.2	1
Diseases of the esophagus, stomach and duodenum	4	7	7	4	0.2	0
Diseases of the peritoneum	5	3	4	5	0.1	0
Noninfective enteritis and colitis	1	1	2	1	0.0	0
Other diseases of the intestines	4	8	7	6	0.2	1
Other/unspecified digestive diseases	19	37	28	28	0.9	2
Kidney diseases	39	47	57	57	1.6	4
Nephritis, nephrosis, nephrotic syndrome	39	44	55	55	1.6	4
Renal tubulo-interstitial diseases	0	1	1	1	0.0	0
Other disorders of the kidney and ureter	0	2	1	1	0.0	0
Homicide	39	48	50	51	1.6	4
Alcohol/drug intoxication	36	37	23	23	1.0	2
Accidental injury	23	31	26	37	1.0	2
Viral hepatitis (all types)	9	16	17	40	0.7	2
Aortic aneurysm	18	15	17	28	0.6	2
Diabetes mellitus	21	11	11	16	0.5	1
Other disorders of the nervous system	12	4	8	10	0.3	1
Anemias	5	8	8	5	0.2	1
Benign neoplasms, in situ neoplasms	6	9	4	7	0.2	1
Unspecified illness deaths —	74	59	71	110	2.6	6
Illness — specific medical cause unknown	64	48	56	101	2.2	6
Illness — multiple medical causes, unresolved[c]	10	11	15	9	0.4	1
All other illnesses	29	34	54	78	1.6	4
Deaths without a known cause —	38	38	25	37	1.1	3
Unknown cause of death	33	36	16	30	0.9	2
Multiple causes, unresolved[d]	5	2	9	7	0.2	0

Note: Detail may not add to total due to rounding. The 20 leading causes of death listed in the table account for 94.7% of all State prison deaths during 2001-2004. Executions are not included; for data on executions see *Capital Punishment, 2005*, <http://www.ojp.usdoj.gov/bjs/abstract/cp05.htm>

[a]Excludes influenza and pneumonia.

[b]Excludes liver diseases

[c]In all such cases, none of the causes of death matched the 63 medical causes of death cited in any record for which a single illness was identified as the cause of death

[d]Such cases were checked "other causes of death," with a text description of events, but the information was insufficient to classify the death to a single cause.

Appendix table 2. Profile of cancer deaths in State prisons, 2001-2004

	Number of State prison inmate deaths, 2001-04											
		Gender		Race/Hispanic origin			Age					
Site of cancer	All inmates	Male	Female	White	Black	Hispanic	Under 18	18-24	25-34	35-44	45-54	55 or older
All causes of death	12,129	11,645	482	5,898	4,714	1,285	7	292	1,041	2,616	3,758	4,402
Cancer, all sites	2,820	2,731	88	1,461	843	218	0	15	75	415	894	1,418
Lung[a]	910	885	25	505	351	44	0	2	4	114	279	511
Liver[b]	276	273	3	111	96	65	0	1	1	22	128	124
Colon[c]	171	166	5	85	60	21	0	1	2	30	59	79
Pancreas	124	123	1	55	52	13	0	0	2	18	37	67
Non-Hodgkin's lymphoma	114	112	2	65	34	14	0	2	7	24	43	38
Prostate	92	92	0	45	38	9	0	0	0	0	9	83
Leukemia	87	84	3	42	36	8	0	2	11	26	21	27
Lip, oral cavity, and pharynx	68	67	1	39	24	3	0	0	0	7	26	35
Stomach	61	59	2	21	35	5	0	1	2	12	19	26
Kidney and renal pelvis	61	60	1	25	33	3	0	0	2	11	25	23
Esophagus	51	50	1	35	12	3	0	0	0	4	12	35
Other lymphoid, hematopoietic and related tissue[d]	44	43	1	17	23	3	0	1	1	7	14	21
Bladder	32	31	1	24	7	0	0	0	0	1	7	24
Skin	29	28	1	24	3	1	0	0	2	11	8	8
Larynx	29	28	1	16	12	1	0	0	0	0	8	21
Breast	17	4	13	4	12	0	0	0	2	6	6	3
Testicles	14	14	0	5	5	4	0	1	5	7	1	0
Ovary	5	0	4	4	0	1	0	0	0	2	2	1
Cervix uteri	3	0	3	1	2	0	0	0	1	1	1	0
Meninges, brain, and central nervous system	3	0	3	1	2	0	0	0	1	1	1	0
Corpus uteri and uterus, part unspecificed	1	0	1	0	1	0	0	0	0	0	0	1
Hodgkin's disease	0	0	0	0	0	0	0	0	0	0	0	0
All other types of cancer	72	71	1	31	27	10	0	2	15	20	14	21
Cancer, type unspecified	585	568	17	323	211	37	0	3	22	99	180	279

Note: Detail does not sum to total because multiple sites of cancer were identified for some cases.

[a]Includes the trachea and bronchus.

[b]Includes the bile ducts.

[c]Includes the rectum and anus.

[d]Excludes Hodgkin's disease, non-Hodgkin's lymphoma, and leukemia.

Appendix table 3. Average annual mortality rate, per 100,000 State prison inmates, from leading causes of death, by selected characteristics, 2001-2004

	Average annual mortality rate, per 100,000 State prison inmates, 2001-04											
		Gender		Race/Hispanic origin			Age					
Cause of death	All inmates	Male	Female	White	Black	Hispanic	Under 18	18-24	25-34	35-44	45-54	55 or older
All causes	250	257	149	343	206	206	107	34	64	177	566	1,973
Heart diseases	68	71	35	102	56	38	0	4	11	41	144	689
Cancer	58	60	27	85	47	39	0	2	5	28	135	635
Liver diseases	25	26	14	37	14	40	0	0	2	19	96	126
AIDS	18	18	12	10	26	18	0	1	8	28	40	25
Suicide	15	15	12	24	8	17	46	14	16	14	15	15
Respiratory diseases[a]	10	10	7	15	9	5	0	2	2	5	18	107
Cerebrovascular diseases	8	8	7	10	8	6	0	1	2	4	21	70
Septicemia	5	5	10	7	5	4	0	0	1	3	15	46
Influenza/pneumonia	5	5	4	7	3	4	0	0	1	3	9	43
Digestive diseases[b]	4	4	2	5	4	6	0	0	1	3	11	32
Number of deaths, 2001-04	12,129	11,645	482	5,898	4,714	1,285	7	292	1,041	2,616	3,758	4,402

Note: The 10 leading causes of death accounted for 90% of all deaths in State prisons during 2001-2004 with a reported cause. Records on 2 deaths did not indicate the gender of the deceased and 13 records were missing the age of the deceased

[a]Excludes influenza and pneumonia.

[b]Excludes liver diseases.

Appendix table 4. Average annual mortality rate of State prisoners age 55 or older, by cause of death, 2001-2004

	Average annual mortality rate, per 100,000 State inmates, 2001-04	
Cause of death	Age 55-64	Age 65 or older
All causes	1,481	3,758
Illness/natural cause*	1,434	3,705
Heart diseases	457	1,528
Cancer	522	1,052
Respiratory diseases	57	288
Cerebrovascular diseases	46	153
Influenza/pneumonia	25	111
Liver diseases	132	103
Septicemia	33	88
Digestive diseases	22	70
Aortic aneurysm	10	62
Kidney diseases	24	58
Accidental injury	5	10
Suicide	17	10
Homicide	8	4
Other	1	4
Intoxication	4	2
Unknown	12	23
Average annual custody population	43,790	12,133
Number of deaths, 2001-04	2,576	1,826

*Includes the 10 leading causes of illness deaths among inmates age 65 or older.

Appendix table 5. Time served since admission for deaths in State prison, age 65 or older, 2001-2004

Time served since admission	Percent of State prisoner deaths, age 65 or older, 2001-04
Less than 1 month	0.7%
1-5 months	4.0
6-11 months	4.4
12-23 months	8.9
24-59 months	17.9
60-119 months	23.1
120-239 months	26.0
240 months or more	15.0

Appendix table 6. Average annual mortality rate for leading causes of illness deaths in State prison, by time served, 2001-2004

	Average annual mortality rate, per 100,000 inmates, 2001-04					
		Time served after admission (in months)				
Cause of death	All inmates	Less than 12	12-23	24-59	60-119	120 or more
All illnesses	223	140	164	184	264	503
Heart diseases	69	44	47	52	84	160
Cancer	58	30	41	46	70	151
Liver diseases	25	14	21	25	31	48
AIDS	18	16	16	16	21	24
Respiratory diseases[a]	10	7	6	8	13	38
Cerebrovascular diseases	8	5	6	6	11	16
Septicemia	5	4	3	5	5	12
Influenza/pneumonia	5	3	4	4	5	10
Digestive diseases[b]	4	3	3	4	4	9
Kidney diseases	4	2	3	3	5	11
Number of illness deaths, 2001-04[c]	10,830	1,908	1,362	2,317	2,106	3,038

Note: Estimates of the number of State prisoners in each category of time served are drawn from the 2004 Survey of Inmates in State Correctional Facilities.

[a]Excludes influenza and pneumonia.

[b]Excludes liver diseases.

[c]Total includes 29 illness deaths in 2001, 23 illness deaths in 2002, 2 illness deaths in 2003, and 45 illness deaths in 2004 missing information on time served.

Appendix table 7. Average annual mortality rate for selected communicable diseases in State prisons, by time served, 2001-2004

	Average annual mortality rate, per 100,000 inmates, 2001-04, by time served (in months)		
Selected communicable diseases	0-11	12-59	60 or more
Viral hepatitis	1	1	3
Tuberculosis	<0.5	<0.5	<0.5
Meningitis	0	0	0
Meningococcal infection	0	0	0
Syphilis	0	0	0

Note: Estimates of the number of State prisoners in each category of time served were drawn from the 2004 Survey of Inmates in State Correctional Facilities.

Appendix table 8. Leading causes of illness deaths in State prisons, by pre-existing status at time of admission and medical treatment provided, 2001-2004

		Medical treatment provided for the fatal medical condition					
Cause of death	Pre-existing condition at time of admission	Evaluated by physician/ medical staff	Diagnostic test (e.g., x-rays, MRI, blood test,)	Medications	Treatments other than medication	Surgery	Housed in a special medical unit
All illnesses	68.3%	94.1%	89.3%	93.3%	70.7%	20.1%	68.2%
Heart diseases	68.4%	90.1%	82.7%	86.8%	57.9%	14.6%	48.3
Cancer	54.4	96.5	94.5	97.8	82.6	30.7	84.7
Liver diseases	88.5	96.7	92.4	97.1	70.7	15.5	74.3
AIDS	93.5	96.2	93.3	96.4	72.8	11.5	72.1
Respiratory diseases[a]	71.9	95.9	63.9	96.7	73.2	12.2	70.8
Cerebrovascular diseases	52.4	89.2	80.9	85.7	64.0	22.8	61.8
Septicemia	68.7	95.5	90.3	95.6	81.4	35.4	82.4
Influenza/pneumonia	38.6	96.2	90.5	96.0	76.4	19.0	70.6
Digestive diseases[b]	67.7	95.6	87.5	93.3	75.3	31.5	71.9
Kidney diseases	77.4	97.1	95.9	97.5	83.8	23.5	77.4

Note: Percentages are based on cases in which provision of specific medical treatments was known

[a]Excludes influenza and pneumonia

[b]Excludes liver diseases.

Appendix table 9. Average annual mortality rate of State prison inmates, per 100,000 inmates, from leading causes of illness deaths, by State, 2001-2004

Region and jurisdiction	Total number of deaths, 2001-04	Average annual mortality rate, per 100,000 State prison inmates, 2001-04					
		All illnesses	Heart diseases	Cancer	Liver diseases	AIDS	Respiratory diseases[a]
U.S. total[b]	12,120	223	68	58	25	18	10
Northeast	1,832	237	74	53	29	26	10
Connecticut[c]	130	141	47	15	32		9
Maine	19	233	81	65	41	15	0
Massachusetts	104	226	86	64	20	10	0
New Hampshire	23	163	10	92	30	10	10
New Jersey	248	201	67	37	12	39	10
New York	712	240	63	59	30	45	10
Pennsylvania	558	328	115	70	41	..	15
Rhode Island[c]	26	121	49	36	0	14	0
Vermont[c]	12	108	36	0	36	36	0
Midwest	2,195	203	79	53	19	8	10
Illinois	337	166	63	42	14	19	3
Indiana	209	219	70	52	21	7	12
Iowa	48	111	30	51	9	0	9
Kansas	105	258	84	65	22	3	6
Michigan	492	231	94	68	24	8	10
Minnesota	47	143	44	41	29	0	4
Missouri	265	207	87	47	19	7	9
Nebraska	29	156	44	37	38	6	6
North Dakota	6	116	71	20	25	0	0
Ohio	446	232	99	60	15	7	18
South Dakota	31	184	75	16	42	0	25
Wisconsin	180	180	74	49	17	4	11
South	5,710	251	75	67	25	25	12
Alabama	329	291	91	71	32	25	13
Arkansas	146	268	92	79	17	21	4
Delaware[c]	63	178	29	33	26	43	11
Florida	813	249	59	78	17	41	8
Georgia	415	201	68	57	14	24	10
Kentucky	164	323	119	94	22	23	14
Louisiana	314	388	117	103	42	53	5
Maryland	287	246	65	63	26	55	13
Mississippi	180	273	80	77	13	13	3
North Carolina	297	199	61	56	19	22	6
Oklahoma	239	234	75	60	29	11	16
South Carolina	229	239	108	39	18	15	13
Tennessee	280	344	116	75	51	22	20
Texas	1,582	241	65	63	30	14	14
Virginia	319	240	73	65	31	24	12
West Virginia	53	326	189	82	7	0	14
West	2,383	181	43	50	29	9	8
Alaska[c]	34	111	53	17	6	0	6
Arizona	289	225	63	67	41	8	8
California	1,306	170	34	49	26	12	8
Colorado	180	202	39	34	58	..	17
Hawaii[c]	36	124	33	19	38	5	5
Idaho	50	182	41	73	23	0	5
Montana	35	272	56	83	47	0	10
Nevada	107	227	75	65	12	12	5
New Mexico	53	181	53	53	25	0	17
Oregon	116	217	82	61	29	2	5
Utah	35	116	35	23	6	0	0
Washington	130	175	61	36	25	9	5
Wyoming	12	142	33	48	14	15	0

Note: All mortality rates were calculated based on custody populations for June 30 in each year.
.. Data not reported due to State law prohibiting the release of named records related to AIDS-related deaths. For information on AIDS deaths in these States, see *HIV in Prisons, 2004*. <http://www.ojp.usdoj.gov/bjs/abstract/hivp04.htm>.

[a]Excludes influenza and pneumonia.

[b]Excludes nine total prisoner deaths reported by the District of Columbia in 2001. Two of these deaths were from heart disease; liver disease, AIDS, respiratory disease, and digestive disease each accounted for one death. The District of Columbia transferred all prisoner custody operations to the Federal Bureau of Prisons during 2001.

[c]Prisons and jails form one integrated system.

Appendix table 10. Average annual mortality rate from leading causes of illness deaths, per 100,000 State prison inmates, among the States, 2001-2004

	Average annual mortality rate, per 100,000 State prison inmates, 2001-04									
	All illnesses		Heart diseases		Cancer		Liver diseases		Respiratory diseases*	
Five highest										
Louisiana	388		West Virginia	189	Louisiana	103	Colorado	58	South Dakota	25
Tennessee	344		Kentucky	119	Kentucky	94	Tennessee	51	Tennessee	20
Pennsylvania	328		Louisiana	117	New Hampshire	92	Montana	47	Ohio	18
West Virginia	326		Tennessee	116	Montana	83	Louisiana	42	Colorado	17
Kentucky	323		Pennsylvania	115	West Virginia	82	South Dakota	42	New Mexico	17
Five lowest										
Vermont	108		New Hampshire	10	Vermont	0	Rhode Island	0	Seven Sates	0
Alaska	111		Delaware	29	Connecticut	15	Alaska	6	(Maine, Massachusetts,	
Iowa	111		Iowa	30	South Dakota	16	Utah	6	North Dakota, Rhode	
North Dakota	116		Hawaii	33	Alaska	17	West Virginia	7	Island, Utah, Vermont,	
Utah	116		Wyoming	33	Hawaii	19	Iowa	9	Wyoming)	

Note: AIDS death rates are not listed because all States did not report AIDS deaths. For information on AIDS deaths by State, see *HIV in Prisons, 2004*, <http://www.ojp.usdoj.gov/bjs/abstract/hivp04.htm>.
*Excludes influenza and pneumonia.

Appendix table 11. Average annual mortality rate, per 100,000 residents, of State prisoners and U.S. residents, by selected characteristics

	Average annual mortality rate, per 100,000 U.S. residents, age 15-64, 2001-03	Average annual mortality rate, per 100,000 State prisoners, 2001-04
All U.S. residents		
All causes	308	250
All, excluding transportation deaths	289	~
Gender		
Male	387	257
Female	231	149
Race/Hispanic origin		
White, non-Hispanic	312	343
Black, non-Hispanic	484	206
Hispanic	180	206
Age		
15-24	81	34
25-34	105	64
35-44	203	179
45-54	430	560
55-64	952	1,481

Note: During the period 2001-2004, inmates age 15 to 64 made up 99% of the State prison population. Mortality data on U.S. residents are from the National Center for Health Statistics at the Centers for Disease Control and Prevention. See "Deaths: Final Data for 2003," *National Vital Statistics Reports*, Volume 54, Number 13, April 19, 2006, <http://www.cdc.gov/nchs/data/nvsr/nvsr54/nvsr54_13.pdf>.
~ Not applicable.

Appendix table 12. Causes of death in State prisons, with International Classification of Disease, 10th revision (ICD-10) codes and average annual mortality rate per 100,000 inmates, 2001-2004

Cause of death (ICD-10 code range)	Number of deaths in State prisons 2001-04	Average annual mortality rate, per 100,000 inmates 2001-04
All causes	12,129	250
Heart diseases (I00-I09, I11, I13, I20, or I51)	3,314	68
Cancer (C00-C97)	2,820	58
Other liver diseases, excluding cirrhosis (K71-K72, K75-K77)	891	18
AIDS[a]	870	18
Suicide[a]	737	15
Cerebrovascular diseases (I60-I69)	394	8
Chronic liver disease (K70, K73-K74)	339	7
Other respiratory diseases (J00-J06, J30-J39, J67, J70-J98)	325	7
Illness — specific medical cause unknown (R00-R99)	269	6
Septicemia (A40-A41)	262	5
Influenza/pneumonia (J10-J18)	225	5
Nephritis, nephrosis, nephrotic syndrome (N00-N07, N17-N19, N25-N27)	193	4
Homicide[a]	188	4
Chronic lower respiratory diseases (J40-J47)	162	3
Alcohol/drug intoxication [a]	119	2
Accidental injury[a]	117	2
Unknown cause of death[b]	115	2
Other diseases of the digestive system (K90-K93)	112	2
Viral hepatitis, all types (B15-B19)	82	2
Aortic aneurysm (I71-I78)	78	2
Diabetes mellitus (E10-E14)	59	1
Illness — multiple medical causes, unresolved[c]	45	1
Other disorders of the nervous system (G90-G99)	34	1
Anemias (D50-D64)	26	1
Benign neoplasms, in-situ neoplasms (D00-D48)	26	1
Disorders of the gall bladder, biliary tract & pancreas (K80-K87)	25	1
Other diseases of the intestines (K55-K63)	25	1
Other causes/manners of death not listed[a]	23	<0.5
Diseases of the esophagus, stomach & duodenum (K20-K31)	22	<0.5
Atherosclerosis (I70)	17	<0.5
Mycoses (B35-B49)	17	<0.5
Diseases of the peritoneum (K65-K67)	17	<0.5
Metabolic disorders (E70-E90)	17	<0.5
Inflammatory diseases of the central nervous system (G00-G09)	17	<0.5
Episodic and paroxysmal disorders (G40-G47)	11	<0.5
Hypertension, hypertensive renal failure (I10-I12)	9	<0.5
Diseases of the veins, lymphatic vessels, lymph nodes (I80-I89)	9	<0.5
Lung diseases due to external agents (J60-J70)	8	<0.5
Systemic atrophies, primarily affecting the central nervous system (G10-G13)	8	<0.5
Congenital malformations, deformations (Q00-Q99)	8	<0.5
Systemic connective tissue disorders (M30-M36)	8	<0.5
Coagulation defects, purpura, other haemorrhagic conditions (D65-D69)	8	<0.5
Other/unspecified infectious diseases (B99)	7	<0.5
Tuberculosis (A16-A19)	6	<0.5
Noninfective enteritis and colitis (K50-K52)	5	<0.5
Protozoal diseases (B50-B64)	5	<0.5
Other bacterial diseases (A30-A39, A42-A49)	4	<0.5
Other disorders of the kidney and ureter (N28-N29)	4	<0.5
Alzheimer's disease (G30)	4	<0.5
Sequelae of infectious & parasitic diseases (B90-B94)	4	<0.5
Other diseases of the blood, blood-forming organs (D70-D77)	3	<0.5
Renal tubulo-interstitial diseases (N10-N16)	3	<0.5
Other disorders of the skin and subcutaneous tissue (L80-L99)	3	<0.5
Certain disorders involving the immune mechanism (D80-D89)	3	<0.5
Organic mental disorders (F00-F09)	3	<0.5
Hypotension & other/unspecified circulatory disorders (I95-I99)	3	<0.5
Obesity and other hyperalimentation (E65-E68)	2	<0.5
Demyelinating diseases of the central nervous system, multiple sclerosis (G35-G37)	2	<0.5
Other disorders of glucose regulation & pancreatic internal secretion (E15-E16)	2	<0.5
Mental & behavioral disorders due to psychoactive substance use (F10-F19)	2	<0.5

Appendix table 12. continued

Cause of death (ICD-10 code range)	Number of deaths in State prisons 2001-04	Average annual mortality rate, per 100,000 inmates 2001-04
All causes	12,129	250
Parkinson's disease (G20-G21)	2	<0.5
Unspecified mental disorders (F99)	2	<0.5
Infections of the skin and subcutaneous tissue (L00-L08)	1	<0.5
Osteopathies and chondropathies (M80-M94)	1	<0.5
Arthritis — inflammatory polyarthropathies (M05-M14)	1	<0.5
Viral infections of the central nervous system (A80-A89)	1	<0.5
Helminthiases (B65-B83)	1	<0.5
Other disorders of the endocrine glands (E20-E35)	1	<0.5
Diseases of the appendix (K35-K38)	1	<0.5
Polyneuropathies & other disorders of the peripheral nervous system (G60-G64)	1	<0.5
Muscle disorders (M60-M63)	1	<0.5

Note: For the entire 4-year period, 66% of the illness death records specified a single medical cause of death. The medical causes listed in these cases were ranked by frequency for both male and female inmates. The medical cause of death for the remaining illness deaths was selected by choosing the most common cause listed, within gender.

[a]ICD-10 codes were only used for deaths attributed to "illness/natural causes." AIDS was a separate category under "cause of death." Any "illness/natural causes" which listed AIDS or HIV among the causes of death were recoded to "AIDS-related" deaths

[b]Cases were checked "other causes of death" with a text description of events, but the information was insufficient to classify the case to any single cause.

[c]In all such cases, none of the causes of death matched the 63 medical causes of death cited in the single-cause cases of illness deaths.

EXHIBIT C

U.S. Department of Justice
Office of Justice Programs

Bureau of Justice Statistics

Washington, D.C. 20531

DEC 18 2007

S. Anne Johnson
Hanson, Bridgett, Marcus, Vlahos & Rudy LLP
425 Market Street, 26th Floor
San Francisco, CA 94105

Dear Ms. Johnson,

In November, you requested that Bureau of Justice Statistics (BJS) staff produce statistical tables of State prisoner death records that would allow for comparisons between California and other States. Attached you will find the data requested. These data are unpublished, but have been verified by BJS staff as accurate.

Attachment 1 presents illness mortality rates for State prisoners in each State for the years 2001 through 2005, as well as an average annual mortality rate for the five-year period. Data are presented for each State, as well as national and regional totals with California data excluded.

Attachment 2 presents comparative counts of deaths and mortality rates, by all causes of death, during the same five-year period. These data allow for comparisons between California State prisoners and those in all other States combined.

I hope these data are helpful. If you have any further requests, please contact Peter Brien, Attorney Advisor, Office of General Counsel in the Office of Justice Programs at (202) 305-0643, or by e-mail at peter.brien@usdoj.gov .

Sincerely,

Jeffrey L. Sedgwick, Ph. D.
Director

Enclosures: Attachment 1 – Illness mortality rates per 100,000 State prisoners, by State, 2001-2005
Attachment 2 – Comparative counts and rates of State prisoner deaths, for California and all other States, by cause of death, 2001-2005

Attachment 1: Illness mortality rate per 100,000 State prisoners, by State, 2001-2005

	Average annual illness mortality rate, per 100,000 State prisoners, 2001-2005	Illness mortality rate per 100,000 State prisoners				
		2001	2002	2003	2004	2005
All States						
All States	224	217	219	232	225	225
Excluding California	232	229	223	241	232	232
Northeast	240	230	234	252	233	249
Connecticut	147	139	125	166	133	173
Maine	186	298	330	102	201	0
Massachusetts	246	250	189	248	219	325
New Hampshire	188	88	383	81	124	285
New Jersey	205	237	191	186	190	220
New York	239	232	246	266	213	234
Pennsylvania	329	284	306	345	378	336
Rhode Island	97	90	165	113	114	0
Vermont	137	144	218	70	0	253
Midwest	201	196	200	201	214	196
Illinois	161	153	144	178	189	141
Indiana	211	227	200	227	224	180
Iowa	133	86	122	119	116	221
Kansas	246	222	228	310	272	199
Michigan	237	215	208	246	255	261
Minnesota	141	192	193	123	84	131
Missouri	206	177	208	198	246	200
Nebraska	152	155	200	121	148	139
North Dakota	108	298	87	0	82	74
Ohio	236	239	247	187	254	251
South Dakota	171	75	204	330	126	118
Wisconsin	165	186	205	174	145	105
South	250	252	234	268	248	246
Alabama	282	332	273	315	245	245
Arkansas	267	308	249	264	253	263
Delaware	192	168	132	251	162	246
Florida	254	243	220	272	260	273
Georgia	205	187	207	243	169	220
Kentucky	314	304	320	348	320	279
Louisiana	397	364	384	344	459	434
Maryland	237	243	215	237	291	198
Mississippi	285	235	208	321	328	334
North Carolina	198	186	157	200	256	191
Oklahoma	239	204	238	303	191	261
South Carolina	248	312	189	281	193	266
Tennessee	345	279	304	464	340	350
Texas	233	259	244	234	227	203
Virginia	240	221	216	273	248	242
West Virginia	311	461	225	366	251	252
West						
All Western States	184	182	196	179	186	198
Excluding California	201	193	209	191	191	220
Alaska	102	120	190	45	90	65
Arizona	220	210	241	243	205	203
California	172	141	187	170	182	181
Colorado	207	223	234	203	147	226
Hawaii	127	79	232	76	109	140
Idaho	184	304	108	179	136	196
Montana	293	189	171	280	449	376
Nevada	230	231	218	207	253	242
New Mexico	193	121	218	179	205	244
Oregon	225	207	238	177	245	258
Utah	113	121	73	136	132	105
Washington	193	183	159	179	188	266
Wyoming	185	197	191	63	115	356

Note: All mortality rates are calculated based on custody populations for June 30. Illness deaths include AIDS deaths.

Source: Deaths in Custody Reporting Program (DCRP), Bureau of Justice Statistics, U.S. Department of Justice. Unpublished analysis performed by BJS staff, November 7, 2007

Attachment 1 highlights:

1) For each year in this period (2001-2005), California prisoners had a lower rate of illness deaths than the total of all other Western States, ranging from 5% lower in 2004 (182 illness deaths per 100,000 inmates vs. 191 per 100,000 for all other Western States) to 27% lower in 2001. Over the entire 5 year period, California's average annual death rate from illness (172 per 100,000) was 14% lower than that of all other Western States (201 per 100,000).

2) For each year in this period, the California prisoner death rate from illness was lower than the total for all other States nationwide, ranging from 16% lower in 2002 (187 per 100,000 compared to 223 per 100,000) to 38% lower in 2001 (141 per 100,000 compared to 229 per 100,000). Over the entire 5 year period, California's average annual illness mortality rate (172 per 100,000) was 26% lower than that of all other States (232 per 100,000).

3) California's prisoner death rate from illness was lowest in 2001 (141 per 100,000), then peaked the following year in 2002 (187 per 100,000). In the most recent years for which data were available, the illness death rate in California prisons was virtually unchanged (182 per 100,000 in 2004; 181 per 100,000 in 2005).

Attachment 2: Comparative counts and rates of State prisoner deaths, for California and all other States by cause of death, 2001-2005.

Number of California prisoner deaths, by cause of death, 2001-2005

	Number of California prisoner deaths					
	2001-2005	2001	2002	2003	2004	2005
All causes	1,672	288	337	333	348	366
Illness	1,302	204	270	260	285	283
AIDS	89	24	26	13	12	14
Suicide	148	30	22	35	27	34
Homicide	63	12	9	15	10	17
Drug/alcohol intoxication	45	11	9	6	9	10
Accident	10	2	1	2	1	4
Other/Don't know	15	5	0	2	4	4

Number of State prisoner deaths (excluding California), by cause of death, 2001-2005

	Number of State prisoner deaths (excluding California)					
	2001-2005	2001	2002	2003	2004	2005
All causes	13,636	2,590	2,609	2,834	2,790	2,813
Illness	11,328	2,099	2,109	2,373	2,360	2,387
AIDS	934	246	219	197	133	139
Suicide	804	139	146	165	173	181
Homicide	181	27	39	35	41	39
Drug/alcohol intoxication	111	25	28	17	14	27
Accident	137	21	30	24	36	26
Other/Don't know	141	33	38	23	33	14

Mortality rate of California prisoners, by cause of death, 2001-2005

	Average annual mortality rate, per 100,000 California prisoners, 2001-2005	Mortality rate per 100,000 California prisoners				
		2001	2002	2003	2004	2005
All causes	207	178	213	207	213	223
Illness	161	126	171	162	174	172
AIDS	11	15	16	8	7	9
Suicide	18	19	14	22	17	21
Homicide	8	7	6	9	6	10
Drug/alcohol intoxication	6	7	6	4	6	6
Accident	1	1	1	1	1	2
Other/unknown	2	3	0	1	2	2

Note: All mortality rates are based on custody populations for June 30.

Mortality rate of State prisoners (excluding California), by cause of death, 2001-2005

	Average annual mortality rate, per 100,000 State prisoners, 2001-2005	Mortality rate per 100,000 State prisoners (excluding California)				
		2001	2002	2003	2004	2005
All causes	251	252	250	268	259	225
Illness	208	205	202	223	219	181
AIDS	17	24	21	19	12	11
Suicide	15	14	14	15	16	14
Homicide	3	3	4	3	4	3
Drug/alcohol intoxication	2	2	3	2	1	2
Accident	3	2	3	2	3	2
Other/unknown	3	3	4	2	3	1

Source: Deaths in Custody Reporting Program (DCRP), Bureau of Justice Statistics, U.S. Department of Justice.
Unpublished analysis performed by BJS staff, November 15, 2007.

Attachment 2 highlights:

1) The tables above provides a comparison of California and all other States for the data presented in Tables 1 & 3 of our online tables of State prisoner mortality data (see: http://www.ojp.usdoj.gov/bjs/dcrp/prisonindex.htm).

2) As these data show, the illness death rate in California prisons was below that of the rate for all other States in each year, averaging 23% lower for the entire 5 year period (161 illness deaths per 100,000 inmates vs. 208 illness deaths per 100,000 inmates).

3) The rate of death from AIDS in California prisons was lower than that of all other States combined in each year as well, averaging about one-third lower over the entire period (11 AIDS deaths per 100,000 inmates vs. 17 AIDS deaths per 100,000 inmates).

EXHIBIT D

Cases in which testimony was given at trial or by deposition for Arthur L. Reingold, MD PhD, 2004-2007

Name of case	Location	Year	Nature of Case
McCormick v. S & G Catering	Los Angeles, CA	2007	Foodborne Hepatitis A
Anslinger v. Coronet Foods, Inc.	Pittsburgh, PA	2007	Foodborne Salmonella
Roselle v. Pilgrim's Pride	Philadelphia, PA	2006	Foodborne Listeriosis
???	Texas	2006	Polio Vaccine and
Cancer	Defendant		
RHSCO v. Munoz Flour	Chicago, IL	2005	Food poisoning
? v. Orthoclinical Diagnostics	Colorado	2005	Autism and Rhogam
Exposure	Defendant		
Smith v. O'Charley's	Knoxville, TN	2005	Foodborne Hepatitis A
Fitch v. GMRI (Red Lobster)	Bowling Green, KY	2005	Foodborne Hepatitis A
Arrendondo v. European Touch	California	2005	Pedicure-related
Mycobacterial	Plaintiff		Infection

EXHIBIT E

Exhibit E to Reingold Report of August 27, 2008

The documents I have reviewed in making this report are the following:

Christopher Mumola, Bureau of Justice Statistics Data Brief: Medical Causes of Death in State Prisons, 2001-2004

Letter from Jeffrey L. Sedgwick to S. Anne Johnson, December 18, 2007, with attached data.

National Vital Statistics Reports, Volume 56, Number 10, April 24, 2008.

Deposition of Christopher J. Mumola, August 25, 2008 (Rough Draft).