RICK L. WILLIAMS

Summary of Professional Experience

Rick L. Williams has more than 35 years of experience as a statistician working in public health–related research. He is actively involved in the development and application of analysis methods for correlated data and for sample survey data. Dr. Williams is skilled in the design of clinical trials, population surveys and observational studies. He routinely leads the statistical activities of large studies and often serves as the overall project director. Dr. Williams has authored many research proposals, study reports, presentations, and refereed articles in publications such as *Biometrics, American Journal of Epidemiology*, and the *Journal of the American Medical Association*. He frequently conducts workshops and training classes on the use of statistical analysis methods for cluster-correlated, longitudinal, or repeated measures data such as generalized estimating equations (GEE) for marginal models, hierarchical linear and nonlinear mixed models, and multilevel models.

Education

PhD, Biostatistics (minor in Epidemiology), University of North Carolina at Chapel Hill, Chapel Hill, NC, 1988.
MS, Statistics, Iowa State University, Ames, IA, 1977.
BS, Mathematics, Arizona State University, Tempe, AZ, 1975. Graduated Magna Cum Laude.

Selected Project Experience

Chronic Effects of Neurotrauma Consortium (2013 to 2018)—*RTI Project Director, Associate Consortium Director, Consortium Co-Principal Investigator.* The primary goal of the consortium is to serve as the comprehensive research network for the U.S. Department of Defense and the U.S. Department of Veterans Affairs focused on the long-term effects of combat-related traumatic brain injury. RTI is serving as the data coordinating center, operating the Biostatistics, Data Management and Study Management Core in collaboration with overall consortium leadership from Virginia Commonwealth University. With total consortium funding of $62.2 million and collaborating institutions across the United States, RTI is coordinating the biostatistical, data management, and study management aspects of the consortium.

Clinical Trials Development Resource for Hematologic Disorders (2012 to 2017)—*Co-Investigator.* RTI is providing assistance to investigators supported by the National Heart, Lung, and Blood Institute to develop clinical trials to test new therapies for hematological disorders. Provides expert scientific and statistical advice, review of protocols and study materials, and training in areas relevant to the design or implementation of clinical trials in hematology.

Obstetrical Pharmacological Research Units Network–Data Coordinating and Analysis Center (2008 to 2010)—*Principal Investigator*. RTI is the data coordinating and analysis center for a network of clinical centers that are evaluating therapeutic drugs for use during pregnancy. Conducted data capture, data management, and statistical analysis for pharmacokinetic and pharmacodynamic models and provided and logistical support.

Mortality, Hospitalizations, and Medical Conditions in Children: Descriptive Epidemiology, Data Analysis, and Report (2005 to 2008)—*Lead Statistician*. This 4-year project supported the Eunice Kennedy Shriver National Institute for Child Health and Human Development (NICHD) with a Congressionally mandated requirement under the Best Pharmaceuticals for Children Act. The Act required NICHD to publish an annual priority list of medications used in the U.S. pediatric population that require further study and label modifications. Prepared tables of the prevalence of conditions treatable by medications and the associated mortality, hospitalization, and physician visit rates for these conditions using national surveys, national vital statistics, and state-level discharge data sets.

O*NET Data Collection Program (2003 to 2008)—*Statistical Task Leader*. This multiyear project collected and analyzed data for a major federal statistical program. Results were published by the U.S. Department of Labor on the knowledge, skills, experience, and training required by more than 800 occupations. The information was used by school and employment counselors to advise on education, training, and career choices. Data were collected via monthly waves of establishment samples from which workers in each occupation were sought and interviewed.

Non-Medical Use and Diversion of Prescription Psychostimulants (2005 to 2007)—*Lead Statistician and Analysis Task Leader*. In collaboration with Harris International, conducted an Internet panel survey of a national sample of individuals aged 18 to 49 years. Created the Internet study design as an alternative to telephone screening to locate diverters of prescription psychostimulants to nonmedical use. Used propensity score models to weight the Internet panel survey respondents to yield nationally representative results. Selected results were validated by comparison to the National Survey on Drug Use and Health. Was responsible for all statistical analyses.

Statistical Consulting for Toxicology Research (1992 to 2007)—*Statistical Consultant*. This project involved conducting safety assessments for a commercial client. Provided rapid turnaround statistical consulting as part of a retainer for an agricultural chemical company. Conducted special analyses for complex data situations (e.g., nonlinear growth curves fitted to repeated measures data to estimate the dose-related time to recovery of cholinesterase activity after exposure to a carbamate). Gained experience with subchronic, neurotoxicology, teratology, and carcinogenicity studies in animals.

Developmental Toxicity Testing and Research for the National Institute of Environmental Health Sciences/National Toxicology Program (1996 to 2003)—*Statistical Consultant.* This project involved the design and analysis of developmental toxicity studies of the dose-interaction of various HIV treatments. Specified experimental design. Helped to develop the definitions and interpretations of different types of dose interaction between two compounds used in HIV treatment for linear and logistic models. Reviewed all statistical methods used in reports to the National Toxicology Program.

Male Attitudes Regarding Sexual Health (2001 to 2002)—*Project Director*. This project was conducted for a pharmaceutical company and involved data collection, analysis, and reporting for a telephone survey of 2,700 men regarding sexual dysfunction. Data were used to establish prevalence of sexual dysfunction in older men and its linkage to risk factors. Used audio-computer assisted telephone interviewing to collect sensitive information. Selected a nationally representative probability sample, which was designed to include adequate numbers of minority respondents for analysis. Designed and completed analyzes for presentations and a final report.

Herpes Simplex Virus Prevalence Study (2002)—*Statistical Leader*. For GlaxoSmithKline (GSK), designed a survey to establish the prevalence of herpes simplex virus (HSV) among patients visiting primary care physicians in affluent suburban areas. Because HSV is a sensitive, sexually transmitted disease, physicians in such settings were reluctant to believe that their patients suffered from HSV; therefore, and many patients were going undetected. Thus, it was important to design a study that would definitively demonstrate the high prevalence of HSV in this setting. Worked with the marketing and

clinical research divisions of GSK to develop a study that met the expectations of both divisions. Working with physicians, epidemiologists, statisticians, clinical research experts, marketing experts, and regulatory staff at GSK, wrote major sections of the study protocol.

SUDAAN: Software for the Statistical Analysis of Correlated Data (1980 to 2000)—*Director* (1995 to 2000). SUDAAN is RTI's software package for the analysis of survey and cluster-correlated data. Specified and developed statistical analysis methods used in SUDAAN. Consulted with leading researchers to determine which methods to implement. Was particularly interested in the application of survey data analysis methods to other correlated data situations. Evaluated hardware and software for use with SUDAAN. Taught numerous 3-day training sessions for the Centers for Disease Control and Prevention (CDC), the National Center for Health Statistics, and the National Center for Education Statistics, as well as public enrollment classes. These classes demonstrated the SUDAAN software package for the analysis of complex sample surveys and cluster-correlated data using GEE. Topics discussed during the classes included descriptive statistics, linear and logistic regression, and proportional hazards models.

Adolescent Women, Infants, and Children Participants Study (1995 to 1999)—*Project Director*. This project involved a national needs assessment of adolescent participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), which was sponsored by the U.S. Department of Agriculture's (USDA's) Food and Consumer Service. Eight focus groups were conducted with WIC clinic staff and 16 focus groups with adolescent WIC participants. Based on the insight gained during the focus groups, two national computer-assisted surveys were planned. First, a national telephone survey of 300 WIC clinics quantified the aspects of clinic operations and the perceptions of clinic staff concerning adolescent needs. Second, a national sample of 3,000 adolescent WIC participants quantified the normative, expressed, and perceived needs of adolescents. The participant survey was conducted in 100 WIC clinics using RTI's audio computer–assisted interviewing system. While the participants were at the clinic for services, clinic staff selected individuals for the sample. Each selected participant then used the audio computer–assisted interviewing system to complete an interview without assistance from a field interviewer or clinic staff. Contacted health directors, WIC directors, attorneys general, and state institutional review boards in 40 states to obtain cooperation and clearance. Data were collected and analyzed on nutrition knowledge and practice, health behaviors, health status, access to services, and pregnancy and conception history.

Adolescent Pregnancy Prevention Protocol (1995 to 1999)—*Protocol Director*. Directed all RTI activities for this protocol. RTI was the data coordinating center for the National Institutes of Health–District of Columbia Initiative on Infant Mortality (NIH-DC Initiative). The NIH-DC Initiative was a cooperative agreement between NICHD and several research and local governmental organizations in the District of Columbia. RTI supported the development of several different research protocols. For the Adolescent Pregnancy Prevention Protocol, RTI worked with Howard University and Georgetown University to develop, implement, and evaluate a school- and clinic-based intervention to reduce the extremely high rate of adolescent pregnancies in the District of Columbia. The study compared three control schools to three intervention schools. Seventh graders in all schools completed a baseline and three follow-up surveys about reproductive knowledge, attitudes, and behavior. In the intervention schools, the seventh-grade students were given an abstinence-based intervention program between the baseline and follow-up surveys.

WIC Infant Feeding Practices Study (1993 to 1997)—*Project Director* (1993 to 1994, while at Battelle) and *Senior Scientist* (1995 to 1997, while at RTI). For USDA's Food and Consumer Service, conducted a longitudinal study on the feeding practices of infants participating in the Special Supplemental Nutrition Program for WIC. This study used computer assisted–telephone and personal interviews conducted once before an infant's birth and nine times during his or her first year of life to gain a complete picture of the

feeding patterns of WIC infants. Designed a national sampling plan that included both telephone and personal interviewing at 19 sites and only telephone interviewing at 23 sites. Worked with each state and local site to obtain cooperation and Institutional Review Board clearances. The interviewers were from all across the United States at the 19 telephone and personal interviewing sites, where WIC participants with and without telephones were interviewed. The same interviewers also conducted telephone interviews in the other 23 sites. The collected data were transferred in-house, and field assignments were updated each night using automated telecommunication methods. Approximately 1,000 participants were interviewed during each data collection round for a total of nearly 10,000 interviews. Used logistic and survival methods to analyze incidence and duration of events such as breastfeeding, use of infant formula, and introduction of solid foods. Led the overall design of the study, selected the samples of WIC clinics and participants, and directed the data analysis.

Minors' Access to Tobacco Products (1993 to 1994)—*Task Leader*. For CDC, developed design plans for an evaluation of the impact of the Synar amendment and possible tobacco tax increase on access and use of tobacco products by minors. Developed sampling and data collection plans for random, unannounced, attempted purchases of tobacco products by underage minors to estimate tobacco vendor compliance with minimum-age-of-sale laws. Conducted an evaluation of commercially available establishment lists as sampling frames.

An Evaluation of the Feasibility of an Injury Risk Factor Surveillance System (1993 to 1994)—*Statistical Task Leader*. For CDC, designed a national random-digit-dialing telephone survey of more than 5,000 households using the GENESYS system. Stratified telephone exchanges by the proportion of minority households in each telephone exchange. Then, telephone numbers in the high-minority exchanges were oversampled to increase the number of African and Hispanic Americans in the study.

Applied Survey Data Analysis Methods (1992 to 1993). Developed and conducted three 2-day training sessions (total of 350 participants) on survey data analysis methods using SUDAAN. Conducted two of the sessions in Washington, DC. These sessions were jointly sponsored by the Washington Statistical Society and the Section on Survey Research Methods of the American Statistical Association (ASA). The sessions focused on the theory, methods, and software for properly analyzing data collected under a complex (stratified, multistage, unequal probability) sample survey.

WIC Modeling and Analytic Projects (1990 to 1992)—*Project Director*. For USDA's Food and Nutrition Service, analyzed several different databases concerning the Special Supplemental Nutrition Program for WIC. The topics of interest included breastfeeding patterns, gestational age at certification, nutritional risk characteristics, and infant formula rebates. Additional topics of interest included income verification and documentation, projection of number of persons WIC eligible, WIC food package contents, and the impact of WIC on infant health expenditures.

Study of the 1988 Clinical Laboratory Improvement Amendments (1992)—*Task Leader*. Directed the Phase II activities of the 1988 Clinical Laboratory Improvement Amendments (CLIA '88) for CDC. The Developed implementation plans for a major national study of the accuracy of medical tests conducted in clinical laboratories. Designed the samples of physicians, clinical laboratories, hospitals, and other physician practice locations where medical tests are ordered. The sampling plan was extremely complex because of the diversity of medical facilities, medical providers, and clinical laboratories involved. Coordinated the CLIA '88 selection of data items, development of survey measurement protocols, and analysis planning.

Schistosomiasis Research Project (1992). For this U.S. Agency for International Development project, traveled to Cairo, Egypt, to consult with researchers studying the prevalence and incidence of schistosomiasis in the Egyptian population using a large-scale sample survey of 150,000 people. Reviewed the study design and developed methods for calculating sampling weights and adjustments for

nonresponse. Conducted training sessions on appropriate survey data analysis methods and the use of the SUDAAN software package.

Study of WIC Participant and Program Characteristics, 1988 (1987 to 1990)—*Sampling and Statistical Analysis Leader*. For USDA's Food and Nutrition Service, designed and selected the WIC Participant and Program Characteristics, 1988 (PC88) samples of WIC states, local agencies, clinics, and participants. Developed field sampling methods for selecting WIC participants to fit each clinic's needs. Use of these methods yielded the desired national sample sizes of WIC participants by the five major WIC participant categories. Conducted field test visits to several WIC clinics to observe their daily operations and record keeping systems and to test field sampling and data collection methods. Reviewed the PC88 study with several state and local WIC agencies to gain their cooperation and support. Directed the collection of participant interview data from approximately 6,600 WIC participants at nearly 200 WIC local agencies and 370 clinics. Directed data analysis and served as lead author of the PC88 Final Report, which was well-received by USDA's Food and Nutrition Service and submitted to Congress. Conducted a 2-day workshop for Food and Nutrition Service staff on the use of the PC88 database. Presented PC88 findings to Food and Nutrition Service staff and to the National Association of WIC Directors.

National Household Survey on Drug Abuse (1989)—*Project Director*. Directed work on the 1988 Population Estimates Report for the National Institute on Drug Abuse. This work involved the development of automated estimation and report generation programs and asymmetric confidence intervals for proportions using a logit transformation. Directed work on the 1988 Sampling Error Report, including the development of generalized variance models based upon log-linear models for the design effect.

Quality of Care Survey of the Evaluation of Medicaid Competition Demonstrations (1986 to 1988)—*Statistical Leader*. For this Health Care Financing Administration study, designed and selected samples of medical care providers and patients from Medicaid provider and claims records and conducted statistical analysis of the data. The survey was designed to compare the quality of medical care received by infants, children, and women under a capitated Medicaid payment system versus traditional fee-for-service payments.

Statistical Survey Institute (1985)—*Fellow*. Fellowship was jointly sponsored by ASA and USDA. Selection was by an ASA peer-review committee. Developed optimal sample design options for longitudinal panel surveys using a double-sampling design with a regression estimator. Used cost-variance optimization methods to determine the most cost-efficient sample design, which simultaneously met multiple precision requirements. Estimated the cost and variance components for each phase of the design. Conducted a presentation of results for USDA staff and members of the Washington Statistical Society. Studied the large sample properties of finite population sample U-statistics.

Evaluation of the Effects of the Omnibus Reconciliation Act of 1981 on Recipients of Aid to Families with Dependent Children (1983 to 1984)—*Statistical Analyst*. For the Social Security Administration's Office of Family Assistance, developed life table methods to study the length of time between client removal from Aid to Families with Dependent Children (AFDC) rolls due to the Omnibus Reconciliation Act of 1981 (OBRA) and re-enrollment in AFDC. The analysis was used to determine if people modified their employment and income (over time) to obtain AFDC benefits after losing those benefits due to the OBRA changes in eligibility requirements. The life table methods were innovative because they fully accounted for the correlated and unequally weighted data, which resulted from the multistage, clustered sample design used to collect the data.

Analysis of Data from the National Medical Care Utilization and Expenditure Survey (1982 to 1984)—*Statistical Task Leader*. For the Health Care Financing Administration, a series of 30 major analytical reports was produced from National Medical Care Utilization and Expenditure Survey data by the Health

Care Financing Administration. For each report, helped design the statistical analyses in consultation with various health analysts, and then supervised a team of statisticians and programmers to complete the analyses.

National Assessment of Educational Progress (1983)—*Statistical Task Leader*. Directed a sample design study for the National Commission of the States. Used cost-variance optimization methods to determine the most cost-effective sample design that simultaneously met multiple precision requirements. Estimated cost and variance models from National Assessment of Educational Progress data.

National Institute of Education Grant (1983)—*Principal Investigator*. Developed and led a methodological study of the effects of a complex sample design on chi-square tests in categorical models. Demonstrated results using data from the National Assessment of Educational Progress.

Hospital Infection Surveillance System (1979 to 1980)—*Statistical Analyst*. For CDC, developed sampling plans for a hospital-based reporting system to monitor nosocomial infections. Analyzed data from the Study on the Efficacy of Nosocomial Infection Control and the National Nosocomial Infections Surveillance to determine effective hospital stratification variables. Studied longitudinal hospital panel changes by linking several years of the American Hospital Association's Annual Survey of Hospitals. Developed survey cost and variance models and determined optimal sample designs that minimized the cost of the survey while meeting necessary precision requirements.

National Longitudinal Study of the High School Class of 1972 (1977 to 1980)—*Sampling Leader*. Conducted this project for the National Center for Education Statistics. For the third and fourth follow-up portions of this study, developed generalized variance models based upon log-linear models for the design effect. Designed and selected a subsample of participants who were administered an ability retest during the fourth follow-up portion of this study.

National Medical Care Utilization and Expenditure Survey: Methods and Analysis (1980)—*Statistical Analyst*. For the National Center for Health Statistics, analyzed data from the National Medical Care Expenditure Survey to develop cost and variance models. Developed optimal sample design recommendations for a national multistage area household survey on medical care utilizations and expenditures, including a provider record check of household report medical events.

National Medical Care Expenditure Survey (1977)—*Statistical Analyst*. Studied optimal sample designs for a household medical care utilization study for the Agency for Health Care Policy Research with a medical provider record check subsample. Directed the imputation of medical expenditures to household survey respondents not selected for medical provider record checking.

Safe Schools Survey (1977)—*Statistical Analyst*. Analyzed data for a national survey of primary and secondary schools concerning violence and safety.

Professional Experience

1995 to date — RTI International, Research Triangle Park, NC.

Principal Scientist (2003 to date). Directs the design and analysis of population surveys, observational studies, and randomized trials. Develops new statistical methods or unique applications of advanced statistical methods. Manages large statistical research efforts.

Global Head for Statistics, Surveys, and Data Management, RTI-Health Solutions (RTI-HS) (2000 to 2003); Senior Director for Research Operations, RTI-HS (2002 to 2003). RTI-HS is RTI's commercial business unit working in health outcomes and epidemiology for the pharmaceutical industry. Was a member of a six-person team that developed the business plan and the founding member of the new business unit. As the Global Head, was responsible for all aspects of statistical analysis, data collection, and data management. As Senior Director, oversaw the research activities of all RTI-HS staff, including approximately 75 researchers from such disciplines as epidemiology, health economics, psychometrics, statistics, survey methodology, and data management.

Senior Program Director (1995 to 2000). Designed, conducted, and analyzed complex statistical research studies. Shared responsibility for management of the 100-member statistical division with prime responsibility for commercial clients in the pharmaceutical and chemical industries. Actively involved in the development and application of analysis methods for correlated data including linear and logistic regression, survival methods, and proportional hazards methods.

1993 to 1994 — Battelle Centers for Public Health Research and Evaluation, Durham, NC, and Battelle Memorial Institute, Columbus, OH.

Program Manager, Centers for Public Health Research and Evaluation. Established and led the statistical division of this new research unit at Battelle. Developed and led public health research projects with CDC, USDA's Food and Nutrition Service, and university-based investigators.

1986 to 1992 — Research Triangle Institute (currently RTI International), Research Triangle Park, NC.

Manager for Analytic Design and Statistical Computing (1988 to 1992); Senior Research Statistician 2 (1986 to 1987).

1985 — Statistical Survey Institute, Washington, DC.

Fellow (jointly sponsored by ASA and USDA). Appointed by a peer-review selection committee for a 1-year fellowship with USDA. Conducted research on double-sampling designs for estimating crop yield.

1977 to 1984 — Research Triangle Institute (currently RTI International), Research Triangle Park, NC.

Senior Research Statistician 1 (1983 to 1984); Research Statistician 2 (1981 to 1983); Research Statistician 1 (1979 to 1981); Statistician 2 (1977 to 1979).

Honors and Awards

Circle of Champions Award, Research Triangle Institute, 1995
Professional Development Award, Research Triangle Institute, 1992
Professional Development Award, Research Triangle Institute, 1987
Fellowship from the Statistical Survey Institute, 1985

Mu Sigma Rho (Statistics Honorary Society)
Pi Mu Epsilon (Mathematics Honorary Society)
Phi Kappa Phi (Academic Honorary Society)

Professional Associations

American Statistical Association, Fellow
International Biometric Society

Professional Service

Reviewer for the *Journal of the American Statistical Association;* the *Journal of Official Statistics;* the *Journal of the Royal Statistical Society, Series A; Lifetime Data Analysis; Statistics in Medicine; and Survey Methodology*
Proposal reviewer, National Institute on Alcohol Abuse and Alcoholism
Session Chair or Discussant at several Joint Statistical Meetings

Books, Book Chapters, and Monographs

Williams, R. L. (2013). Survey sampling and weighting. In *Encyclopedia of Health Economics.* Amsterdam, The Netherlands: Elsevier. In press.

Williams, R. L. (2008). Effective sample size. In P. J. Lavrakas (Ed.), *Encyclopedia of survey research methods*. Newbury Park, CA: Sage.

Williams, R. L. (2008). Taylor series linearization. In P. J. Lavrakas (Ed.), *Encyclopedia of survey research methods*. Newbury Park, CA: Sage.

Tobia, A., Pontal, P. G., McCahon, P., Carmichael, N. G., Rieth, J. P., & Williams, R. L. (2001). Aldicarb: Current science-based approaches in risk assessment. In R. Krieger (Ed.), *Handbook of pesticide toxicology,* 2nd Ed. Academic Press.

Folsom, R. E., LaVange, L. M., & Williams, R. L. (1989). A probability sampling perspective on panel data analysis. Invited paper presented at the 1987 international symposium on panel surveys. In D. Kasprzyk, G. Duncan, G. Kalton, & M. P. Singh (Eds.), *Panel surveys*. New York: John Wiley & Sons, pp. 108–138.

Williams, R. L., Folsom, R. E., & LaVange, L. M. (1983). The implications of sample design on survey data analysis. In T. Wright (Ed.), *Statistical methods and the improvement of data quality*. Orlando, FL: Academic Press, Inc., pp. 267–295.

Peer-Reviewed Journal Articles

Phelps, D. L., Ward, R. M., Williams, R. L., Watterberg, K. L., Laptook, A. R., Wrage, L. A., et al. (2013). Pharmacokinetics and safety of a single intravenous dose of myo-inositol in preterm infants of 23–29 wk. *Pediatric Research, 74*(6), 721–729.

Bieler, G., Brown, G., Williams, R., & Brogan, D. (2010). Estimating model-adjusted risks, risk differences, and risk ratios from complex survey data. *American Journal of Epidemiology, 171*(5), 618–623.

Berzofsky, M. E., Williams, R. L., & Biemer, P. P. (2009). Combining probability and non-probability sampling methods: Model-aided sampling and the O*NET data collection program. *Survey Practice, August*.

McCann, M. F., Baydar, N., & Williams, R. L. (2008). Consumption of soft drinks and other sweet drinks by WIC infants. *American Journal of Public Health, 98*(10), 1735.

Williams, R. L., Mihlan, G. J., & Tobia, A. J. (2008). Modeling cholinesterase activity for human dietary risk assessment of carbamate insecticides. *Risk Analysis: An International Journal, 28*(4), 1069–1079.

McCann, M. F., Baydar, N., & Williams, R. L. (2007). Breastfeeding attitudes and reported problems in a national sample of WIC participants. *Journal of Human Lactation, 23*(4), 314–324.

Novak, S., Kroutil, L. A., Williams, R. L., & Van Brunt, D. L. (2007). The nonmedical use of prescription ADHD medications: Results from a national Internet panel. *Substance Abuse Treatment, Prevention, and Policy, 2*, 32.

Price, C. J., George, J. D., Marr, M., Myers, C., Bieler, G., Williams, R., & Jahnke, G. D. (2006). Prenatal developmental toxicity evaluation of 2',3'-dideoxyinosine (ddi) and 2',3'-didehydro-3'-deoxythymidine (d4t) co-administered to Swiss albino (CD-1) mice. Birth Defects Research, Part B: Developmental and Reproductive Toxicology, 77(3), 207–215.

Schlenger, W. E., Williams, R. L., & Blitstein, J. L. (2005). Letter to the editor. *Journal of the American Medical Association, 294*(20), 2578–2579.

Clayton, C. A., Starr, T. B., Sielken, R. L., Williams, R. L., Pontal, P.-G., & Tobia, A. J. (2003). Using a non-linear mixed effects model to characterize cholinesterase activity in rats exposed to aldicarb. *Journal of Agriculture, Biological, and Environmental Statistics, 8*(4), 420–437.

Cook, S. F., Visscher, W. A., Hobbs, C. L., & Williams, R. L. (2002). Project IMPACT: Results from a pilot study of a new observational database. *Critical Care Medicine, 30*(12), 2765–2770.

Aarons, S. J., Jenkins, R. R., Raine, T. R., El-Khorazaty, M. N., Woodward, K. M., Williams, R. L., Clark, M. C., & Wingrove, B. K. (2000). Postponing sexual intercourse among urban junior high school students—a randomized controlled evaluation. *Journal of Adolescent Health, 27*, 236–247.

Williams, R. L. (2000). A note on robust variance estimation for cluster-correlated data. *Biometrics, 56*, 218–219.

Cook, S. F., Visscher, W. A., Hobbs, C. L., & Williams, R. L. (1999). Project impact: Preliminary results from a pilot validity study of a new observational database. *Critical Care Medicine, 27*(1), A36.

Phillips, C. D., Sloane, P. D., Hawes, C., Koch, G., Han, J., Spry, K., Dunteman, G., & Williams, R. L. (1997). Effects of residence in Alzheimer disease special care units on functional outcomes. *Journal of the American Medical Association, 278*(16), 1340–1344.

Williams, R. L. (1995). Product-limit survival functions with correlated survival times. *Lifetime Data Analysis, 1*, 171–186.

Bieler, G. S., & Williams, R. L. (1995). Cluster sampling techniques in quantal response teratology and developmental toxicity studies. *Biometrics, 51*, 764–776.

Bieler, G. S., & Williams, R. L. (1993). Ratio estimates, the delta method and quantal response tests for increased carcinogenicity. *Biometrics, 49*, 793–801.

Other Papers

Williams, R. L. (1989). Large sample theory for U-statistics in unequal probability samples. Ph.D. Dissertation, Department of Biostatistics, University of North Carolina at Chapel Hill. Institute of Statistics Mimeo Series No. 1860T.

Presentations and Proceedings

Shook-Sa, B. E., Heller, D. C., Williams, R. L., Couzens, G. L., & Berzofsky, M. E. (2014). Comparing generalized variance functions to direct variance estimation for the National Crime Victimization Survey. In *Federal Committee on Statistical Methodology Proceedings*, pp. 1–14.

Bieler, G., Brown, G. G., & Williams, R. L. (2008, August). *Estimating model-adjusted risk and prevalence ratios from survey data in SUDAAN Release 10.0*. Presented at Joint Statistical Meetings, Denver, CO.

Berzofsky, M., Welch, B., Williams, R., & Biemer, P. (2006). Using a model-assisted sampling paradigm instead of a traditional sampling paradigm in a nationally representative establishment survey. *Proceedings of the American Statistical Association, Section on Survey Research Methods*, pp. 2763–2770.

Williams, R. L., & Pitts, A. D. (2006). *The median test for cluster correlated data.* Presented at the 2006 Joint Statistical Meetings, Seattle, WA.

Gordek, H., Williams, R. L., & Dai, L. (2006). *Weighting an Internet panel survey on drug use and abuse.* Presented at the 2006 Joint Statistical Meetings, Seattle, WA.

Lantz, J. L., Mihlan, G. M., Young, B. M., Kelly, I. V., & Williams, R. L. (2005). *Carbamate dietary exposure assessment incorporating cholinesterase recovery into CARES-compatible module.* Annual International Society of Exposure Analysis Conference, Tucson, AZ. (Abstract W1E-4).

Price, C. J., George, J. D., Marr, M. C., Myers, C. B., Bieler, G. S., Williams, R. L. (2005). *Developmental toxicity evaluation of 2',3'-dideoxyinosine (ddi) and 2',3'-didehydro-3'-deoxythymidine (d4t) co-administered by gavage to Swiss albino (CD-1®) mice during embryo/fetal development.* Presented at the Teratology Society's 45th annual meeting, St. Pete Beach, FL. *Birth Defects, Part A, Clinical and Molecular Teratology*, 73(5), p. 361. (Abstract No. P42).

Price, C., Marr, M., Myers, C., Bieler, G., Williams, R., & Jahnke, G. (2004). *Developmental toxicity evaluation of 3'-azido-3'-deoxythymidine (AZT) and (-) 2', 3'-dideoxy-3'-thiacytidine (3TC) co-administered by gavage to Swiss albino (CD-1) mice on gestational days (gd) 6 through 16.* Presented at the Teratology Society's 44th annual meeting, Vancouver, BC, Canada. *Birth Defects Research, Part A*, 70(5), p. 316. (Abstract No. P66).

Price, C. J., Marr, M. C., Myers, C. B., Bieler, G. S., Williams, R. L., Rao, G., & Jahnke, G. D. (2002). *Developmental toxicity of 3'-azido-3'-deoxythymidine (AZT) and 2', 3'-dideoxycytidine (ddc) co-administered to CD-1® mice on gestational days (gd) 6 through 15*. Presented at the Teratology Society's 42nd annual meeting, Scottsdale, AZ. *Teratology*, 65(6), p. 340. (Abstract P44).

Williams, R. L., Rieth, J., & Tobia, A. (2001). *Nonlinear mixed-effects models for acetylcholinesterase activity in humans exposed to aldicarb.* Presented at the Society of Toxicology's 47th annual meeting, San Francisco, CA.

Clayton, C. A., Starr, T. B., Sielken, R. L., Williams, R. L., P-G. Pontal, & Tobia, A. J. (2001). *Using a non-linear mixed effects model to characterize cholinesterase activity in rats exposed to aldicarb.* Presented at the Society of Toxicology's 47th annual meeting, San Francisco, CA.

Williams, R. L. (1999). *Nonlinear mixed effects models for acetylcholinesterase activity.* Presented at the meetings of the International Biometric Society Eastern North American Region, Atlanta, GA.

Williams, R. L. (1999). *New features for gee and survey data analysis in SUDAAN*. Presented at the 1999 Joint Statistical Meetings, Baltimore, MD.

Bieler, G. S., & Williams, R. L. (1997). Analyzing repeated measures and cluster-correlated data using SUDAAN. Presented at GlaxoWellcome, Inc., Research Triangle Park, NC.

Bieler, G. S., & Williams, R. L. (1997). Analyzing repeated measures and cluster-correlated data using SUDAAN. Presented at the 1997 Joint Statistical Meetings, Anaheim, CA.

Bieler, G. S., & Williams, R. L. (1997). Analyzing survey data using SUDAAN. Presented at the 1997 Joint Statistical Meetings, Anaheim, CA.

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