



Quantitative Risk Analysis in Animal Health and Food Safety

Workshop history

[EpiX Analytics](#) (formerly called Vose Consulting) is one of the leading institutions providing training in quantitative risk analysis in animal health and food safety. We have taught the **Quantitative Risk Analysis in Animal Health and Food Safety** course in the last three ISVEE conferences, with an approximate number of 16 attendees per workshop. This class is an introductory version of our popular Animal Agriculture Food Safety Risk Analysis course which we have continuously delivered for almost a decade. Dr. Zagmutt, the instructor for this course, has personally taught risk analysis methods to over 370 professionals in every continent, accounting for a total of over 1,100 hours of training during his 6-year tenure at EpiX.

General information and objectives

This 3-day hands-on workshop will cover the key principles of **quantitative risk analysis** in epidemiology and food safety, and the most important risk modeling methods available. The participants will learn to use different risk analysis modeling environments (primarily @RISK with Excel and some examples with the statistical software R, but the lessons apply equally well to other modeling environments). The workshop will focus on how to conduct accurate and effective quantitative risk analyses, including best risk modeling practices, selecting appropriate distributions, using data and expert opinion, and avoiding common modeling mistakes. The course will also cover essential probability and statistics theory and various stochastic processes to provide participants with a solid understanding of the foundations of quantitative risk analysis.

Number of attendees - minimum 8, maximum 20

Target audience/background skills

Anyone that needs to conduct, present or critique quantitative risk analyses in animal health, veterinary epidemiology, and/or food safety. This course is also well suited for professionals providing input to risk analyses.

Participants should be reasonably proficient in Excel, but no prior experience with @RISK or performing risk analysis is required. Participants very proficient in the R statistical language can develop the exercises using this platform. The instructor will help them solve their problems, but the solutions to group problems will be shown in Excel and @RISK to maximize the time devoted to risk modeling concepts.

Training material

Lecture notes both in hardcopy and CD will be provided. The CD will also contain all model files produced for the course and many extra example models and material for participants to train during and after the course. Additional models developed during the course will be posted in a webpage especially created for the course. Also, free copies of ModelAssist[®], EpiX Analytics' reference software in risk analysis, will be provided to the participants.

Course program

Day	Content
Day 1	<ul style="list-style-type: none">• Introduction to animal health risk analysis<ul style="list-style-type: none">○ Background of risk analysis in animal health: History, OIE code, Codex• How epidemiology relates to risk assessment• Introduction to probability theory and statistical descriptors<ul style="list-style-type: none">○ Moments, percentiles and more○ The use of distributions: uncertainty, variability and inter-individual variability○ Probability concepts○ Graphical representations of risk events○ Introduction to some commonly used probability distributions• Introduction to risk modeling<ul style="list-style-type: none">○ Monte Carlo simulation, @RISK and Excel, the R statistical environment○ Calculation vs. simulation - the pros and cons of Monte Carlo○ Typical risk analysis results, their presentation and interpretation○ Practical problems to solve
Day 2	<ul style="list-style-type: none">• Some stochastic processes - the basis of risk analysis<ul style="list-style-type: none">○ Binomial Process<ul style="list-style-type: none">▪ Binomial, beta, negative binomial and geometric distributions▪ Population and individual state with imperfect test○ Poisson Process<ul style="list-style-type: none">▪ Poisson, gamma, exponential, Erlang, Polya, and Delaporte distributions▪ Modeling outbreak incidence, seasonal Poisson○ Hypergeometric process<ul style="list-style-type: none">▪ Hypergeometric and inverse Hypergeometric distributions▪ Herd state estimate with imperfect diagnostic test○ Aggregate modeling<ul style="list-style-type: none">▪ Calculating indemnification costs and summing large number of random variables
Day 3	<ul style="list-style-type: none">• Introduction to analyzing and using data for risk analysis:<ul style="list-style-type: none">○ Statistical techniques○ Epidemiological techniques○ Creating uncertainty distributions<ul style="list-style-type: none">▪ Classical statistical tests▪ The bootstrap▪ Applied Bayesian modeling<ul style="list-style-type: none">▪ True prevalence estimation with uncertainty• Example risk analyses based on epidemiological data• Wrap up and review of course material

Logistics

Participants will be required to bring their own laptops with @RISK, Microsoft Excel, a PDF reader, and with a functional CD drive. Trial versions of @RISK can be found from Palisade's website [here](#). As the trial license of @RISK lasts 15 days, participants should install it only a few days before the course.

Registration fee

€1,150 per participant (see following information on **registration discounts and free registration awards**). A 10% discount will be available to any full fee paying participant applying and paying by May 1st, 2012 (deadline for ISVEE workshops registration is June 1st, 2012). A discount will also be available to multiple bookings (group rate). In an effort to encourage participation from students with limited budget, **two free registration awards** will be offered to post-graduate (master or PhD) students currently working on risk analysis projects as part of their thesis. The awardees will be selected by EpiX Analytics based on the relevance of the projects and the applicant's need for economic support. Participants interested in group discounts, and graduate students interested in applying for the registration award should contact Ms. Barbara O'Neill (BOneill@epixanalytics.com) for further details.

Sample quotes from previous workshop participants

EpiX Analytics consultants are outstanding professionals in the field of quantitative risk assessment. They provided training that our staff will find valuable as we develop quantitative risk assessment to guide food safety decisions in the U.S.

Janell R. Kause, Director Risk Assessment Division
Office of Public Health Science - Food Safety and Inspections Service
United States Department of Agriculture
Participant to private risk analysis training for USDA-FSIS, July 2009

Dr. Francisco Zagmutt's four-day course on Introduction to Animal Health Risk Modeling was extremely worthwhile. His methods of reviewing the vast amount of information on which the field is based and seamless introduction of brand new concepts are expert, and it is obvious that he is extremely knowledgeable and genuinely interested in the subject matter. Francisco always had the right anecdote or bit of history to put the issues at hand into context, and in so doing, made for a richer, more memorable experience than just introduction of formulae and application to a specific dataset. He also had an affable and approachable attitude that generated a friendly atmosphere amongst a diverse group of students and promoted a camaraderie that outlasted the few short days of the course. My only regret is that we didn't have longer to soak up more knowledge about this fascinating subject!

Kristen Reyher, DVM, MRCVS, PhD
Centre for Veterinary Epidemiological Research
Atlantic Veterinary College
Epi on the Island course participant, August 2010

Biography of workshop organizer: Dr. Francisco J. Zagmutt

Dr. Zagmutt is a managing partner at EpiX Analytics. As part of his consulting and research work, Francisco has performed and supervised numerous animal health and food safety quantitative risk assessment projects composed of multidisciplinary and multinational teams. Through this work, Francisco has supported decision makers in the development of governmental and private policies in the United States and abroad. Francisco also has experience providing expert witness support on trade litigations and participating on international expert working groups.

Francisco has developed a well-known reputation in the epidemiology and food safety community for his teaching abilities and for his clarity when communicating complex risk assessment principles to a broad audience. As such, Francisco has ample experience teaching courses, workshops and seminars on risk analysis, epidemiology and simulation modeling for public and private institutions worldwide. He is the main instructor of EpiX Analytics' epidemiology and animal health courses, including the internationally renowned Animal Agriculture and Food Safety Risk Analysis course, and the Quantitative Risk Analysis and Disease Modeling in Epidemiology course which Francisco developed based on his working experience modeling the risk of introduction and spread of diseases in populations. Francisco has also been an epidemiology and risk analysis instructor for the prestigious Foreign Animal Disease courses organized by the USDA in Plum Island, NY, and for the Epi on the Island course series in PEI, Canada.

Francisco has presented his work at international conferences, published articles in a number of scientific journals, and is the author of two risk analysis book chapters. He is a reviewer for several scientific journals such as the *Risk Analysis* Journal and has also acted as an independent reviewer in scientific panels.