Abbreviated abstracts/descriptions of some of the journals and articles, grouped by journal (ordered by the impact factor) for the last several years (2005-2014) of research output.

Almost all of my articles were published in collaboration with a group of medical researchers at the University of South Florida. I am always the only mathematician (sometimes we have a statistician) in the team. Therefore, I am the one that usually develops the theoretical mathematical background for the model and the analytical, statistical, simulation, or programming tools we need to understand the problem. The medical researchers usually introduce a variety of model variables and specific concepts and topics/goals to investigate. Whenever you look at any of the papers we published and see a graph, a tree diagram, a mathematical formula or a result of a mathematical simulation – I was heavily involved in producing that part of the project.


The same issue of JAMA also contained an editorial addressing our article titled “The Case for Randomized Trials in Cancer Treatment. New Is Not Always Better” by A. Grann and V. Grann.

Abstract The superiority of innovative over standard treatments is not known. To describe accurately the outcomes of innovations that are tested in randomized controlled trials (RCTs) 3 factors have to be considered: publication rate, quality of trials, and the choice of the adequate comparator intervention. We determined the success rate of innovative treatments by assessing preferences between experimental and standard treatments according to original investigators’ conclusions, determining the proportion of RCTs that achieved primary outcomes’ statistical significance, and performing meta-analysis to examine if the summary point estimate favored innovative vs standard treatments. We found that the results in individual trials cannot be predicted in advance indicating that the system and rationale for RCTs is well preserved and that successful interventions can only be identified after an RCT is completed.


Abstract Peer-reviewed opinion piece arguing that "The drug development process could be substantially improved if rigorous randomized trials become the first rather than the last step in the process of discovery of new, effective drugs and if randomization permeates testing at all stages."


Abstract: To provide the totality of research evidence related to the effects of PBSCT versus BMT, we conducted an individual-patient data meta-analysis using data from nine randomized trials enrolling 1,111 adult patients. I developed the individual-patient meta-analysis algorithms from scratch in statistical software STATA.


The same issue of British Medical Journal also contained an editorial addressing our article titled: “In praise of uncertainty” by F. Godlee.

1 The impact factor is a measure of citation rate per article, and is calculated by dividing one years’ worth of citations to a journal's articles published in the previous two years by the number of major articles [e.g., research papers, reviews] published by that journal in those two years. For most of the journals – the last year the impact factor was calculated is 2012.
2 All citations counts were found on Google Scholar. If the number of citations is 0 (zero), the phrase “Number of Citations” was omitted.
3 I am a member of this group.
4 according to JCO’s archives – couldn’t find it on Google Scholar.
Abstract: To assess how often new treatments for childhood cancer assessed in phase III randomized trials are superior or inferior to standard treatments and whether the pattern of successes and failures in new treatments is consistent with uncertainty being the ethical basis for enrolling patients in such trials. 126 trials were included, involving 152 comparisons and 36 567 patients. The results indicated that new treatments are as likely to be inferior as they are to be superior to standard treatments. This result was not affected by publication bias, methodological quality, treatment type, disease, or comparator.

Abstract: We combined our two previously published models to calculate the probability above which research findings may become acceptable. A new model indicates that the probability above which research results should be accepted depends on the expected payback from the research (the benefits) and the inadvertent consequences (the harms). This probability may dramatically change depending on our willingness to tolerate error in accepting false research findings. Our acceptance of research findings changes as a function of what we call “acceptable regret,” i.e., our tolerance of making a wrong decision in accepting the research hypothesis.

Abstract: The evaluation of research output, such as estimation of the proportion of treatment successes, is of ethical, scientific, and public importance but has rarely been evaluated systematically. We assessed how often experimental cancer treatments that undergo testing in randomized clinical trials (RCTs) result in discovery of successful new interventions. Data from 624 trials (781 randomized comparisons) involving 216 451 patients were analyzed. In all, 30% of trials had statistically significant results, of which new interventions were superior to established treatments in 80% of trials. Approximately 25% to 50% of new cancer treatments that reach the stage of assessment in RCTs will prove successful.

Abstract: The treatment success in cancer is a controversial topic. The current approach for evaluating the risk of random error in meta-analysis (TSA) can accommodate binary and continuous data but not time-to-event data. We developed a new method and applied our method in MA for treatments of multiple myeloma and compared our results with published “standard analyses”. We concluded that our new method demonstrates the possibility of incorporating time-to-event outcomes into TSA and reveals that some already published MAs have potentially inconclusive results.

Content: This was a short letter explaining how to use benefits/harms data in the national discussion on policy of administering screening mammography tests to all women of a certain age.

Content: This is a short (referred) letter to the editor commenting on a published article and adding another dimension to their argument and several other trials for a meta-analytical publication.

Abstract: We assessed the impact of optimism bias on a proportion of trials that did not answer their research question successfully, and explored whether poor accrual or optimism bias is responsible for inconclusive results using a systematic review of 359 trials (374 comparisons) enrolling 150,232 patients. We concluded that formal statistical inference is sufficient to answer the research question in 75% of RCTs. The answers to the other 25% depend mostly on subjective judgments, which at times are in conflict with statistical inference. Optimism bias significantly contributes to inconclusive results.

Abstract: The current approach for evaluating the risk of random error in meta-analyses (MAs) using trial sequential analysis (TSA) can accommodate binary and continuous data but not time-to-event data. We developed a new method and applied our method in MAs for treatments of multiple myeloma and compared our results with published “standard analyses”. We concluded that our new method demonstrates the possibility of incorporating time-to-event outcomes into TSA and reveals that some already published MAs have potentially inconclusive results.
Abstract: To model how to select the optimal pair of type I and II errors that maximize study value when there are constraints on the available study sample size. Correct inferences (true positives, true negatives) increase and wrong inferences (false positives, false negatives) decrease the value of a study. We model the composite value of a study based on these 4 inferences, their relative importance, and relative frequency using variable multiplicative and additive models.

Abstract: Utilizing Early Breast Cancer Trialists’ Collaborative Group (EBCTCG) data, a Markov model was generated to model 15-year survival showing that reliable early survival data may be used to generate models that accurately estimate 15-year survival in ER-positive ESBC.

Abstract: Direct head-to-head comparison of Melphalan, Prednisone plus Bortezomib (MPB) versus Melphalan, Prednisone plus Thalidomide (MPT) is lacking. We developed methods, software and performed an indirect meta-analysis to assess the treatment effects of MPB versus MPT indirectly, using six randomized controlled trials (RCTs) enrolling 2,798 patients.

Abstract: We use social network analysis to study the impact of interactions between RCTs on treatment success. Our dataset consists of 280 phase III RCTs conducted by the NCI from 1955 to 2006. The RCT networks are formed through trial interactions formed i) at random, ii) based on common characteristics, or iii) based on treatment success. We analyze treatment success in terms of survival hazard ratio as a function of the network structures. We conclude that the chances of discovering life-saving treatments are directly related to the richness of social interactions between researchers.

Abstract: We undertook a systematic review of all consecutive, published and unpublished phase III cancer randomized controlled trials (RCTs) conducted by GlaxoSmithKline (GSK) and the NCIC Clinical Trials Group (CTG). While overall industry sponsorship is associated with higher success rates than publicly-sponsored trials, the differences seems to have disappeared over time.

Abstract: We tested the hypothesis that genetic variants in four Peptidoglycan recognition proteins (PGLYRP) genes associate with Crohn’s disease (CD) and/or ulcerative colitis (UC) and with gender and/or age of onset of disease in the patient population. We identified 16 polymorphisms in the four PGLYRP genes that significantly associated with CD, UC, and/or subgroups of patient populations. Of the 16, 5 significantly associated with both CD and UC, 6 with CD, and 5 with UC. Our data demonstrate that genetic variants in PGLYRP genes associate with CD and UC and may provide a novel insight into the mechanism of pathogenesis of IBD.


I did the simulations, Stela developed the statistical formulas (and she never lets me forget that!)

Abstract: We use the cognitive emotion of regret to serve as a link between intuition (system 1), and analytical, deliberative process (system 2) and to reformulate Decision curve analysis (DCA). Based on the concept of acceptable regret we identified the circumstances under which a decision maker tolerates a potentially wrong decision and expressed it in terms of probability of disease. We present a novel method for eliciting decision maker's preferences and an alternative derivation of DCA based on regret theory.

28. Athanasios Tsalatsanis, Laura E Barnes, Iztok Hozo and Benjamin Djulbegovic, "Extensions to Regret-based Decision Curve Analysis: An application to hospice referral for terminal patients", BMC Medical Informatics and Decision Making 2011, 11:77 Number of Citations: 3

Abstract: We present a novel theoretical framework that is based on well-established methodologies of prognostication and decision analysis to assist with the hospice referral process for terminally ill patients. We present a theoretical framework to facilitate the hospice referral process.


Abstract: Dual processing theory of human cognition postulates that reasoning and decision-making can be described as a function of both an intuitive, experiential, affective system (system I) and/or an analytical, deliberative (system II) processing system. To date no formal descriptive model of medical decision-making based on dual processing theory has been developed. Here we postulate such a model and apply it to a common clinical situation: whether treatment should be administered to the patient who may or may not have a disease. We developed a mathematical model in which we linked a recently proposed descriptive psychological model of cognition with the threshold model of medical decision-making and show how this approach can be used to better understand decision-making at the bedside and explain the widespread variation in treatments observed in clinical practice.

Contemporary Clinical Trials

Contemporary Clinical Trials is an international peer reviewed journal that publishes manuscripts pertaining to all aspects of clinical trials, including, but not limited to, design, conduct, analysis, regulation and ethics. Manuscripts submitted should appeal to a readership drawn from disciplines including medicine, biostatistics, epidemiology, computer science, management science, behavioral science, pharmaceutical science, and bioethics. Impact Factor: 1.597

30. Miladinovic B, Kumar A, Hozo I, Djulbegovic B. “Trial sequential analysis may be insufficient to draw firm conclusions regarding statistically significant treatment differences using observed intervention effects: A case study of meta-analyses of multiple myeloma trials.” Contemporary Clinical Trials 34 (2013) 257–261 Number of Citations: 2

Abstract: Trial sequential analysis (TSA) has been proposed as a method to assess the risk of random error in cumulative meta-analysis (MA), which increases due to repeated significance testing. We present empirical evidence from a recent systematic review to demonstrate that the use of TSA may lead to a premature declaration of statistically significant treatment difference, when further accumulated evidence suggested otherwise.

THE STATA JOURNAL

The Stata Journal is a quarterly publication containing articles about statistics, data analysis, teaching methods, and effective use of Stata's language. The Journal publishes reviewed papers together with shorter notes and comments, regular columns, book reviews, and other material of interest to researchers applying statistics in a variety of disciplines. Impact Factor: 1.31


Abstract: This is a technical article explaining our method and its implementation in the statistical package STATA.


Content: This is a book chapter in which we provide an overview and analysis of the uncertainty in medicine and the theories that have been put forward to understand it. We describe a variety of theories, means of measurement, and areas of empirical work about this topic, and in each case, one or more medical cases which illustrate how the uncertainty can be or has been applied to medical reasoning or medical problems. Finally, we consider some of the implications of this discussion for how uncertainties need to be managed, how they need to be communicated to patients, and what sort of training is appropriate for health care professionals who will be dealing with these phenomena of uncertainty.