



International Chinese Statistical Association

泛華統計協會

Bulletin

會刊

ICSA 2022 Official Election Results Announcement

COVID Coping and The Law of Most People

A Dispute in Science – and a Goodbye

Upcoming Events

Call for Nominations for 2023 ICSA Officers

Call for Nominations for 2022 ICSA Awards



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From the Editor

Ming Wang

Dear ICSA Members:

Welcome to our first issue of the 2022 ICSA Bulletin! Happy New Tiger Year!

It is hard to believe we have been in the pandemic for more than two years. As we turn the page on 2021 and embark on a new journey for 2022, it is that time to reflect and think about the things that bring our ICSA community the news, gratitude and hope. As the editor-in-chief of the ICSA Bulletin, I am truly grateful for the dedication and support of our leadership team and community, in particular the guidance of the 2021 President Dr. Colin Wu, the 2022 President Dr. Zhezhen Jin and Executive Director Dr. Mengling Liu, and also the contribution provided by our ICSA committee and every one of you. In the new year, we continue to work together to make our association larger and stronger as a cohesive and collaborative whole.

In this issue of the ICSA Bulletin, there are one ICSA 2021 panel article and two column articles. The panel recap article is provided by Dr. Kelly H. Zou. In the 2021 International Chinese Statistical Association (ICSA) Applied Statistics Symposium, Dr. Zou organized and mediated a panel that includes six experts from either academia, industry or consulting, and the panelists covered the key elements to form and sustain successful collaborations and partnerships, along with challenges and barriers. These discussions were recapped in two articles published in *Amstat News* (<https://magazine.amstat.org>; January and February issues, 2022). Here, we merge these two articles and reprint them with permission for our ICSA community. Appreciate Dr. Zou's effort and contributions to our ICSA activities, and hope these suggestions are beneficial for our members at different levels and with various interests and backgrounds!

In the column "XL-Files," Professor Xiao-Li Meng shared his opinions on how to deal with uncertainty and risk as statisticians or probabilists. In particular, Prof. Meng focused on and answered two questions: First, in our daily lives, are we coping with uncertainty and risk better, on average, than are people in other professions? Second, how can we use our knowledge and expertise to help others during these unprecedentedly unsettling times? From this article, we are encouraged to take advantage of our strength and expertise to help others better understand their risk and reduce uncertainty and

fear. This is a reprint from the author's column "COVID Coping and The Law of Most People" in the *IMS Bulletin*, April/May 2020. In the column "Hints from Hans," Professor Hans Rudolf Künsch talked about a dispute in science. In this article, Prof. Künsch discussed how science can unfold the history of the earth which involves time scales and processes beyond ordinary human conception, and later showed some examples related to statistics as well as existing and relevant disputes and controversies. Thanks for Prof. Künsch's thoughts that shed some light on these questions to be solved in the near future! It is with mixed emotions that this is the farewell article from Prof. Künsch. As many of you know, Prof. Künsch has been a dedicated and loyal advocate of our bulletin, and has been writing the column article for a couple of years. We are thankful Prof. Künsch has been actively sharing his thoughts with our ICSA members in particular junior investigators with a different cultural background. We wish Prof. Künsch all the best and spend time with family with joy and relax!

In addition, thanks to the founding editor-in-chief of Prof. Meng of Harvard Data Sciences Review (HDSR), an open access resource for leading and advanced content in data science, we reprint one HDSR article entitled "COVID-19: A Massive Stress Test With Many Unexpected Opportunities (for Data Science)" that may be of interest to our members. In this article, Prof. Meng shared his thoughts on COVID-related challenges and also opportunities for data science, and highlighted several critical topics for our community. In the end, we really appreciate Prof. Meng's generosity and strong support on our ICSA and the Bulletin!

Regarding to ICSA business, this issue of the Bulletin includes a message from the 2022 ICSA President, Dr. Zhezhen Jin, and also the 2021 ICSA President, Dr. Colin Wu; the announcement of ICSA 2021 official election results; the call for Nominations of Candidates for 2023 ICSA Officers; the call for Nominations of the 2022 ICSA Awards; new elected Fellows and ICSA members awards; report for the 2022 ICSA Applied Statistics Symposium; report from the ICSA Springer Book Series in Statistics and ICSA sponsored and co-sponsored journals. This issue also contains the 2021 ICSA Financial Report, and the coming ICSA sponsored or co-sponsored meetings and conferences announced in the end.

Finally, I would like to thank all the contribu-

tors, ICSA executives and committee members for their support on our bulletin work. I want to thank Dr. Chixiang Chen to serve my assistant and helping me on sending follow-up emails and file generation. Their help, support and enthusiasm are critical to ensure this issue come out on time.

I wish each of you and your loved ones find peace, happiness and good health in the New Year. Let's keep going by supporting each other and contribut-

ing ourselves to our ICSA community.



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From the 2022 President, ICSA

Zhezhen Jin



Dear ICSA Members,

ICSA was established at the 1987 joint statistical meetings in San Francisco, and it enters 35th birthday this year. ICSA has been promoting statistics research, applications and education and providing service to our members

and statistical community. I take on the great honor of serving ICSA President this year.

Although the year 2021 was a challenging year because of pandemic, ICSA continued to have a productive year with the dedicated service from many members who have contributed their time and energy supporting and participating ICSA activities. I would like to thank our outgoing officers as without them we would not have had this success. Thank you to Dr . Jianguo (Tony) Sun for your hard work last three years as ICSA President-Elect, President, Past-President. Thank you to Dr. Rochelle Fu for your three years as the ICSA treasurer and the Chair of Financial Committee. Thank you to Dr. Yinglei Lai, Dr. Lei Shen, Dr. Yifei Sun, Dr. Xin Tian and Dr. Kelly Zou for your service over three years as Board of Directors. I also would like to thank the past Awards Committee Chair Judy Wang, past Nominating and Election Committee Chair Ming Tan, Special Lecture Committee Chair Gang Li, past Publication Committee Chair Ming-Hui Chen, past Membership Committee Chair Bo Fu and Co-Chair Liuquan Sun, past Archive Committee Chair Xin Tian, and past Financial Advisory Committee Chair Rui Feng for their dedicated service. Special

thanks to Dr. Guoqing Diao and his team for organizing another successful applied statistical symposium from September 12 to September 15, 2021. Although the symposium was held virtually, the Organizing Committee developed a comprehensive scientific program with a theme of “Leading with Statistics and Innovation”. It covered a broad spectrum of topics across multiple disciplines, including Statistics, Data Science, Computer Science, Biomedical Research, and other related fields with 3 keynote lecture, 6 short courses, 109 scientific sessions and a poster session. Due to the continuation of COVID-19 pandemic, 2021 ICSA China conference was postponed in spite that it was prepared well by the organization committee led by Dr. Yingying Fan and Dr. Chunjie Wang. We hope to have the meeting to be held from July 1 to July 4, 2022.

Looking forward to 2022, although we still faces challenges and difficulties due to the uncertainty caused by COVID-19 pandemic, we will continue to advance ICSA mission to promote statistical theory and application, to broaden applications of statistical techniques, to foster cooperative efforts among different fields through various activities. We plan to have full of ICSA meetings and conferences in person. The 2022 ICSA Applied Symposium will be held from Sunday June 19 to Wednesday June 22, 2022 at University of Florida, Gainesville, FL. Thanks to Dr. Peihua Qiu and Dr. Samuel Wu and their team for organizing the symposium. The 2022 ICSA China conference which was postponed from last year is scheduled to be held at Xi’an University of Finance and Economics from July 1 to July 4, 2022, Xi’an, China. The 12th ICSA International Conference will be held from December 18 to December 20, 2022 at the Chinese University of Hong

Kong, Hong Kong. Thanks to Dr. Xin-Yuan Song, Dr. Tony Jianguo Sun and Dr. Xingqiu Zhao for their tremendous time and effort in organizing this triennial conference. The fifth symposium of ICSA-Canada Chapter will take place from Friday, July 8 to Monday, July 10, 2022. I would like to thank Dr. Dehan Kong for leading the organizing committee.

In a new era of data science, artificial intelligence, data engineering and data analytics, it is increasingly important that our association could provide better platforms and opportunities to our members for their professional growth. I will work closely with ICSA executives, board of directors, members of various committees to enhance existing activities and to identify new activities in this regard. In particular, we will continue our close collaboration with other statistical societies and seek collaboration with other quantitative professional societies.

As emphasized previous ICSA leaders and executives, the continuous growth of our association depends on our membership recruitment and retention. The Membership Committee chaired by Dr. Zhigen Zhao is currently compiling and targeting potential members. I hope that our members can participate in the membership drive by either asking friends to join if they are not ICSA members or letting the membership committee members know the name and contact information of the potential members. It is essential to have members from different regions and different disciplines. Potential growth will largely come from current and future graduate students. Continuing education and training in leadership skills are essential for the ICSA members in their career development, I encourage our members to actively participate in organizing ICSA activities which can provide an environment by working through people to create and contributing community practice. It is also essential to nurture future ICSA leaders who are passionate and skillful to run many ICSA activities. I will work closely with the Special Lecture Committee chaired by Dr. Hongzhe Li to provide possible leadership training activities.

The publication of scientific journals is critical for ICSA. Since its inception in 1991, *Statistica Sinica* has established as a prestigious leading journal in our field. The success is impossible without

outstanding and tremendous service of the editors and editorial board over the years. I would like to thank current co-editors Dr. Rong Chen, Dr. Xiaotong Shen and Dr. Su-Yun Huang for their dedicated service. *Statistics in Biosciences (SIBS)* is relatively new and is on way of arising. Dr. Hongzhe Li just completed his co-editorship at the end of 2021 and Hongkai Ji serves as a co-editor at the beginning of 2022. I would like to thank the outgoing co-editor Hongzhe Li, current co-editors Joan Hu and Hongkai Ji for their time and effort making SIBS thrive. I encourage our members to submit their papers to our journals. Thanks to Dr. Din Chen for his dedicated time and effort, ICSA has been successfully publishing ICSA Springer Book series. I also would like to thank Dr. Ming Wang, Editor of ICSA Bulletin, Dr. Grace Li, Editor of ICSA monthly newsletter, for their dedicated service. I encourage our members to share their opinions and creative ideas through our Bulletin and newsletters. The elected officers including president and board of directors are the virtual governing body of ICSA. About one third of the directors are newly elected each year. I encourage our members to run for the position. It would be a great opportunity to serve and engage in management of the development of ICSA. For more information on nomination and election, please contact any members of the 2022 Nominating and Election Committee chaired by Dr. Wenqing He. With great sadness, we recently lost two dedicated members: Dr. Hoi Ying Linda Yau and Dr. Guanghan Frank Liu. Dr. Yau served as ICSA treasurer in 2013-2015 and a member of Finance Committee in 2016-2018. Dr. Guanghan Frank Liu served as a member of executive organizing committee for 2008 ICSA Applied Symposium and recently just started as the Chair of 2022 Lingzhi Lu Award Committee.

I look forward to working with you. Please let me know if you have any suggestions to improve ICSA. Wishing a safe and rewarding 2022 to all.

Zhezhen Jin, Ph.D.
2022 President,
Professor,
Department of Biostatistics,
Mailman School of Public Health,
Columbia University.

From the 2021 President, ICSA

Colin Wu



Dear ICSA members and friends,

It has been a great honor for me to serve as the president of ICSA in the past year. Although we endured the continuous impact of COVID-19 pandemic in 2021, I have witnessed great resilience and enthusiasm from our members. This experience has enabled me to better appreciate the value of ICSA and reminded me how the activities of ICSA have helped the career developments of our members. Despite the disruption caused by the pandemic, I am happy to report that we held many successful activities, although virtually, in 2021. These activities continued our time honored tradition of being an intellectual home for the ICSA members. As I have moved to the new role of Past-President, I am thankful to my predecessor, Dr. Jianguo (Tony) Sun, who laid the groundwork for many of the activities we had in 2021. I am sure that, under the new leadership led by President, Dr. Zhezhen Jin, and President-Elect, Dr. Gang Li, we will resume our much anticipated in-person meetings and activities. With the gradual easing of travel and gathering restrictions within the United States and elsewhere, I am expecting a much more enjoyable and productive year in 2022.

To highlight a few activities in the past year, we had a successful Applied Statistics Symposium, which was held virtually on September 12-15, 2021. Dr. Guoqing Diao and the Program Committee worked tirelessly arranging the online meeting platform, organizing the scientific sessions, and raising funds. Their dedicated service was crucial for the success of this symposium, which was greatly appreciated by the symposium participants. A noteworthy program of the symposium was the two virtual panel discussions on pressing issues facing Asian American statisticians and data scientists. Panel 1 was on “Leadership and Communications for Statisticians and Data Scientists” moderated by Dr. Jiayang Sun (George Mason University). Panel 2 was on “Statistics and Data Science Partnerships and Collaborations across Sections” moderated by Dr. Kelly H. Zou (Viatrix). I had the privilege to join my fellow panelists, Dr. Hulin Wu (University of Texas Health Science Center at Houston, UTHealth), Dr.

Xihong Lin (Harvard University), Dr. Sylva Colins (FDA), Dr. Ruixiao Lu (Dahshu) and Dr. Catherine Truxillo (SAS), on Panel 1 to discuss my experience of serving ICSA for the past year. I learned a lot from these distinguished panelists as well as the session participants, and, at the end of the session, I had better appreciation of Paul J. Meyer’s famous saying “Communication –the human connection – is the key to personal and career success.” I also enjoyed very much the discussion of Panel 2 and would like to thank the panelists, Dr. Victoria Gamerman (Boehringer-Ingelheim), Dr. John E. Kolassa (Rutgers University), Dr. Jim Z. Li (Viatrix), Dr. Fanni Natanegara (Eli Lilly and Company), Dr. Kimberly Sellers (Georgetown University), Dr. Aniketh Talwai (Mediadata, Dassault Systemes Company) and Dr. Kelly H. Zou, for sharing their insightful comments and professional advises.

Given that Asian American statisticians are still facing significant challenges to reach senior leadership roles in major institutions, the issue of improving leadership and communication skills for Asian American statisticians needs a timely discussion and has also been seriously advocated by the International Indian Statistical Association (IISA) and the Korean International Statistical Society (KISS). The three sister societies, ICSA, IISA and KISS, have been planning for joint activities since early 2020. A notable strength of ICSA is that we have many outstanding senior and junior members who can provide a wider range of insightful views and experience that can benefit all of us. In addition to the outstanding scientific presentations, the ICSA conference series is a perfect platform to discuss this type of pressing issues facing many of our members. It is unfortunate that, due to the COVID-19 pandemic, we were not able to hold the ICSA international meetings for the last two years. I am hopeful that we will resume our normal international meetings in the near future.

Many of our ICSA members had received various awards in 2021 in recognition of their outstanding achievements. I would like to congratulate the ICSA recipients Dr. Cun-Hui Zhang (Rutgers University) for the Distinguished Achievement Award, Dr. Heping Zhang (Yale University) for the Outstanding Service Award, Dr. Anru Zhang (Duke University) and Dr. Yifei Sun (Columbia University) for the Outstanding Young Research Award, Dr. Ji Zhu (University of Michigan) for the Pao-Lu Hsu Award, Dr. Yi Tsong (FDA) for the Pres-

ident Citation, Drs. Huling Wu (UTHealth), Momi Xiong (UTHealth), Jianhua Huang (Texas A&M University), Xi Luo (UTHealth), Yunxin Fu (UTHealth), Ashraf Yassen (UTHealth), Hongyu Miao (UTHealth) and Dejian Lai (UTHealth) for the Significant Contribution Awards. I am especially happy that thirteen new generation of statisticians were winners of the ICSA 2021 Applied Statistics Symposium Student Awards: Bing Li (Brown University) for the Jiann-Ping Hsu Award; Yujia Deng (University of Illinois Urbana Champaign), Subhankar Bhadra (North Carolina State University), Ying Zhou (University of Toronto), Rui Miao (George Washington University) and Ziyang Yin (Temple University) for the Student Paper Award; Yang Ou, Yu Xia, Shunyan Luo, Juntao Su, Lanqiu Yao, Joshua Loyal, and Nan Miles Xi for the Poster Award. Congratulations to all! Your contribution makes ICSA strong and our society better. In addition to the ICSA award, Dr. Anru Zhang was also the recipient of the ASA Gottfried E. Noether Junior Award (2021), Bernoulli society New Researcher Award (2021) and IMS Tweedie Award (2022). Big congratulations, Anru, way to go!

Since the operation of ICSA depends on the ded-

icated volunteer service of our members, I would like to express my sincere appreciation to all the members of the ICSA Board of Directors and committees as well as the editors and associate editors of the ICSA journals, *Statistica Sinica* and *Statistics in Biosciences*, and ICSA Co-Sponsored Journal, *Statistics and Its Interface*, who served during 2021. I am particularly grateful to the Executive Director, Dr. Mengling Liu, whose outstanding management skills have kept all the activities well organized and smoothly executed, and the Financial Committee Chair, Dr. Rochelle Fu, whose financial knowledge and attention to details have kept ICSA on a solid financial footing. I am looking forward to seeing many of you at the upcoming 2022 ICSA Applied Statistics Symposium in Gainesville, Florida, as well as the 2022 Joint Statistical Meetings in Washington DC.

Colin Wu Ph.D.

2022 Past President, ICSA

Mathematical Statistician, National Heart, Lung and Blood Institute, National Institutes of Health.

From the 2022 President-Elect, ICSA

Gang Li



Dear ICSA Members,

I am honored and humbled to be elected as the 2022 ICSA President-Elect. It is a privilege to join the current ICSA leaders and an amazing team of dedicated volunteers to serve the ICSA community.

I would like to take this opportunity to thank the past and current ICSA leaders and volunteers for their extraordinary leadership and service. I would also like to thank all ICSA members and friends whose magnificent work and support have made positive impact in so many ways on our ICSA community, our profession, and beyond. Volunteerism is

among the core values of ICSA. It is the inspiration and contribution of every one of you that have made ICSA such a premium and rewarding organization today. As we navigate our life through the ongoing pandemic, your participation has become more important than ever. I am looking forward to working with all of you to promote the missions of ICSA, tackle rising challenges, seize new opportunities, and continue the shared success of ICSA. May 2022 bring us all renewed inspiration, happiness, hope, and success!

Gang Li, Ph.D.

2022 President-elect,

Professor of Biostatistics and Computational Medicine, University of California at Los Angeles.

From the Executive Director 2020-2022

Mengling Liu



Dear ICSA members,
Happy New Year!

As 2022 opens with a huge hurdle created by Omicron, I think we will all agree that the pandemic has been draining and challenging, to say the least. As difficult as these times are, they are also filled with opportunities and hopes. We learn to adapt to uncertain situations and continue to serve as a strong community at ICSA. In the past year, our annual ICSA Applied Statistics Symposium was held virtually and all organizational activities were conducted remotely. I'm deeply grateful to work with many dedicated members who devoted countless hours from their

busy schedule to ICSA.

Look forward this year, it's hopeful that we will be able to come back together in person at the 2022 ICSA Applied Statistics Symposium and enjoy direct communications. The thought is already exciting. We would like to invite all to attend and thank you in advance for your continued support and commitment to ICSA.

Wish you all a happy, healthy, and successful 2022!

Mengling Liu, Ph.D.

ICSA Executive Director (2020-2022)

Professor of Biostatistics,

Department of Population Health,

Department of Environmental Medicine,

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AD HOC COMMITTEES:

- 2022 ICSA China Conference: Yingying Fan (Chair, fanyingy@usc.edu)
- 2022 Applied Statistics Symposium: Samuel Wu (Chair, samwu@biostat.ufl.edu)
- CHAPTERS
 - ICSA-Canada Chapter: Yingwei (Paul) Peng (Chair, pengp@queensu.ca)
 - ICSA-Midwest Chapter: Li Wang (Chair, li.wang1@abbvie.com)
 - ICSA-Taiwan Chapter: Chao A. Hsiung (Chair, hschung@nhri.org.tw)

Call for Nominations for 2023 ICSA Officers

Deadline: April 1, 2022

The ICSA 2022 Nomination and Election Committee is seeking for nominations of candidates for ICSA 2023 officers: ICSA President-Elect 2023 and ICSA Board of Directors (2023-2025). The committee plans to identify two candidates for the ICSA President-Elect 2023 and twelve candidates for ICSA Board of Directors for general election. Candidates for all positions need to be active ICSA members in 2022 and have strong interests in serving ICSA. According to the ICSA Bylaws, President-Elect should be from academia, non-academia, or

no restriction, on a three-year rotational basis –one year from academia, another from non-academia, and the third year open. There is category restriction for the candidates this year (2023 is the year for non-academic, so the candidates should be from either industry or government). We hope that the candidates for Board of Directors are balanced with respect to gender, region, and area of employment (academia, industry/business, or government). Please file your nomination through the google form at <https://forms.gle/VqzSaTizLn4P6gLZA> by April 1, 2022. You may contact Professor Wenqing He at whe@stats.uwo.ca if you have any questions.

ICSA Financial Report

July 1, 2021 through December 31, 2021.

International Chinese Statistical Association Profit and Loss

July 1, 2021 through December 31, 2021

Beginning Cash Balance (Bank/Paypal accounts)	7/1/2021	\$	582,302.98
Income:			
		\$	19,110.53
Membership from Paypal Account		\$	11,800.00
Membership from Institute of Mathematical Statistics		\$	540.00
From JP Hsu Account		\$	100.00
Job Posting		\$	582.00
Interest		\$	88.53
Springer Science		\$	6,000.00
Total Income		\$	19,110.53
Expense:			
		\$	(14,715.74)
IT Cost		\$	(10,227.58)
ICSA Office Cost		\$	(710.00)
Award Plaque and Package		\$	(362.62)
Postage		\$	(108.28)
Tax Filing Fee		\$	(1,769.00)
Flower Spray		\$	(191.55)
SIBS Best Paper Award		\$	(1,000.00)
Paypal Fee		\$	(346.71)
Total Expense		\$	(14,715.74)
Net Total Income		\$	4,394.79
Transfer			
To 2022 Applied Symposium Account		\$	(5,000.00)
To Vanguard Investment Account		\$	(333,000.00)
Ending Cash Balance (Bank/Paypal accounts)	6/30/2021		\$248,697.77
ASSETS			
Main Checking/Savings/PayPal		\$	248,697.77
Vanguard Investment Balance		\$	935,986.18
TOTAL ASSETS		\$	1,184,683.95
LIABILITIES & EQUITY			
Equity			
Main Accounts Opening Balance July 1, 2021		\$	582,302.98
July 1 to December 31, 2021 Net Income(+)/Expense(-)		\$	4,394.79
Transfer to 2022 Symposium Account		\$	(5,000.00)
Transfer to Vanguard Investment Account		\$	(333,000.00)
Symposium Bank Accounts (2018, 2021, 2022) Opening Balance July 1, 2021		\$	17,978.40
July 1 to December 31, 2021 Net Income(+)/Expense(-)		\$	28,412.58
Vanguard investment account opening balance on July 1, 2021		\$	577,057.21
Transfer from Main Bank account		\$	333,000.00
July 1 to December 31, 2021 Investment Profit(+)/Loss(-)		\$	\$25,928.97
Total Equity		\$	1,231,074.93
TOTAL LIABILITIES & EQUITY		\$	1,231,074.93



Rongwei (Rochelle) Fu, PhD,
Treasurer (2019-2021), ICOSA
Professor,
OHSU-PSU School of Public Health.

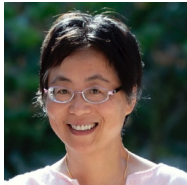
ICSA 2022 Official Election Results Announcement

ICSA 2022 President Elect:



Dr. Gang Li
University of California at Los Angeles

ICSA Board of Directors (2022-2024):



Annie Qu
University of California Irvine



Hao (Helen) Zhang
University of Arizona



Xingqiu Zhao
The Hong Kong Polytechnic University



Lan Wang
University of Miami



Gang Li
Eisai, Inc.

New Elected 2021 Fellow of AERA

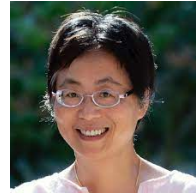
Congratulations to our ICSA member: Dr. Zhiliang Ying, Department of Statistics at Columbia University, on being named Fellow by the American Educational Research Association (AERA). AERA Fellow is nominated by peers, selected by the Fellows Committee and approved by the AERA Council. Election as a Fellow members have demonstrated distinguished and sustained research achievements.



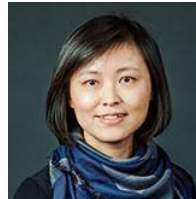
*Zhiliang Ying, PhD
Professor and Director
Department of Statistics,
Columbia University.*

New Elected 2021 Fellows of AAAS

Congratulations to two ICSA members: Dr. Mingyao Li, University of Pennsylvania, and Dr. Annie Qu, University of California, Irvine on being elected as a Fellow of American Association for the Advancement of Science (AAAS). Election as a Fellow honors members whose efforts on behalf of the advancement of science or its applications in service to society have distinguished them among their peers and colleagues.



*Annie Qu, PhD
Professor
Department of Statistics, University of California, Irvine.*



*Mingyao Li, PhD
Professor
Department of Biostatistics and Epidemiology, University of Pennsylvania.*

COPSS Leadership Academy

Congratulations to our ICSA member: Dr. Xi Chen, New York University, on being elected to COPSS Leadership Academy. Members of the Leadership Academy will be selected based on outstanding contributions to the field of statistical science in one or more of the following areas: education, training, and mentoring; original research and software development; impactful and ethical practice; and service to

the profession and to society.



*Xi Chen, PhD
Associate Professor
Department of Technology, Operations, and Statistics, New York University.*

Call for Nominations for 2022 ICSA Awards

Distinguished Achievement Award

In recognition of the distinguished achievement in statistical research and unselfish support of the association. The nominator is responsible for preparing a complete package for the nominee that should at minimum contain the following: 1) nominee’s most recent curriculum vitae; 2) cover letter from the nominator summarizing the nominee’s achievement in statistical research and unselfish support

of the association. Besides items 1) and 2), additional nomination material such as recommendation letters is encouraged but not required. Please submit the nomination materials via the online Google Form at <https://forms.gle/gbTMEkBuTJjcfKkZ6>. Nomination items can be uploaded as pdf, ps or plain text attachments. For questions, please contact the Award Committee Chair, Professor Chunming Zhang (awards@icsa.org).

The deadline for nomination is April 1, 2022.

Most recent winner: Cun-Hui Zhang, Ph.D., Rutgers University.

Outstanding Young Researcher Award

In recognition of the outstanding research in statistical theory, methodology, and/or applications. The nominator is responsible for preparing a complete package for the nominee that should contain the following: 1) nominee's most recent curriculum vitae; and 2) cover letter from the nominator summarizing the nominee's achievement in statistical research and/or applications. Additional nomination materials such as recommendation letters are encouraged but not required. Please submit the nomination materials via the online Google Form at <https://forms.gle/gbTMEkBuTJjcfKkZ6>. Nomination items can be uploaded as pdf, ps or plain text attachments. For questions, please contact the Award Committee Chair, Professor Chunming Zhang (awards@icsa.org).

The deadline for nomination is April 1, 2022.

Most recent winners:

- Anru Zhang, Ph.D., University of Wisconsin-Madison.
- Yifei Sun, Ph.D., Columbia University.

Lingzi Lu Memorial Award

In 2013, the American Statistical Association in partnership with the International Chinese Statistical Association (ICSA) created the Lingzi Lu Memorial Award in remembrance of Lingzi Lu. The first-year student in the statistics master's program at Boston University lost her life in the bombing at the Boston Marathon in April of that year. She was an ambitious, talented, and vibrant student, who looked forward to a career as a master's-level statistician. Through this award, the ASA and ICSA support the studies of similarly dedicated people who are in master's programs in statistics or who have recently earned their master's degree in statistics. The award provides up to \$1,300 for registration and travel support to the ASA Conference on Statistical Practice, which takes place every February.

Applications are due by October 15 and more details could be found at

<https://www.amstat.org/ASA/Your-Career/Awards/Lingzi-Lu-Memorial-Award.aspx>

Most recent winner: Shan Wu, University of Pittsburgh

Report from Statistica Sinica Co-Editors

Rong Chen, Su-Yun Huang, and Xiaotong Shen

In the past 12 months, from August 1, 2020, to July 31, 2020, *Statistica Sinica* receives 451 submissions, including nine to a special issue and 442 original articles; The total number of submissions remains relatively stable in the recent years. Of the 442 original papers, we have accepted 61 and rejected 278, with other 109 under various revision stage. Because we decided not to use the 'rejection with revision allowed' option, our number of revisions is higher than before. Overall, we expect that our eventual acceptance rate for this group of papers will be higher than that in the past. Although it is very possible that we have received better papers this year, we

may need to consider raising our acceptance standard slightly higher, as we have a strict limit on the number of pages to publish each year.

During the first year of our tenure, we have modified the editorial policies to expedite the review process. As a result of the effort of the editorial team, the median, the third quartile and the 95 percentile review times are shortened significantly comparing to the earlier years around the same censor time. We deeply appreciate the extraordinary effort by our associate editors to make such an improvement possible. This would certainly make the journal more attractive to authors and will attract more and better papers.

Table 1. Manuscript received from August 2020 to July 2021

Manuscript Type	Number of Manuscripts	Percentage
Original Article	438	97.9%
Special Issue Paper – In Honor of Professor Tze Leung Lai	9	2%
Total	447	

Table 2. Submissions and acceptances for the past 6 years.

	Aug 2015 – Jul 2016	Aug 2016 – Jul 2017	Aug 2017 – Jul 2018	Aug 2018 – Jul 2019	Aug 2019 – Jul 2020	Aug 2020 – Jul 2021
Acceptance	104	150	146	76	82	123
Submission	567	531	486	448	460	447

Table 3. Review status for the past 3 years.

	Aug 2018–Jul 2019		Aug 2019–Jul 2020		Aug 2020–Jul 2021	
Rejected w/o external review	218	48.6%	170	36.9%	187	41.8%
Rejected with external review	108	24.1%	141	30.6%	97	21.7%
Rejected with revision allowed	3	0.6%	5	1%	6	1.3%
Major/Minor revision	2	0.4%	2	0.4%	14	3.1%
First submission under review	0	0%	0	0.0%	1	0.2%
Revision under review	0	0%	0	0.0%	15	3.3%
Withdrawn	0	0%	2	0.4%	0	0.0%
Accepted	76	16.9%	82	17.8%	123	27.5%
Total	407		402		443	

Table 4. Top ten countries with the highest submissions for the past 3 years.

Rank	Aug 2018 - Jul 2019		Aug 2019 - Jul 2020		Aug 2020 - Jul 2021	
1	USA	141 (41.1%)	USA	127 (29.8%)	USA	148 (32.8%)
2	China	108 (31.5%)	China	121 (28.4%)	China	117 (25.9%)
3	Canada	19 (5.5%)	H.K.	17 (4.0%)	Canada	21 (4.7%)
4	Italy	12 (3.5%)	Canada	15 (3.5%)	H.K.	17 (3.8%)
5	India	12 (3.5%)	UK	14 (3.3%)	Italy	14 (3.1%)
6	Iran	11 (3.2%)	Iran	12 (2.8%)	Taiwan	12 (2.7%)
7	Taiwan	10 (2.9%)	Singapore	10 (2.3%)	Brazil	11 (2.4%)
8	Spain	10 (2.9%)	Taiwan	9 (2.1%)	India/ Pakistan	9 (2.0%)
9	H.K.	10 (2.9%)	Australia/ Japan	8 (1.9%)	Iran/Japan/ UK	8 (1.8%)
10	Germany	10 (2.9%)	Saudi Arabia	7 (1.6%)	Saudi Arabia	7 (1.6%)

Currently we have an 18-month backlog for accepted papers to be published formally, though we post all accepted papers online immediately after acceptance. In order to shorten the backlog without

reducing the number of accepted papers, we plan to publish additional online-only special issues that are not restricted to the publication page limit.

The journal’s impact factor in 2020 reaches al-

Table 5. Percentiles of review time in days for the past 3 years.

Period	5th	25th	50th	75th	95th	Sample Size
Aug 2018 – Jul 2019	3	10	29	100	171	450
Aug 2019 – Jul 2020	5	13	37	105	185	467
Aug 2020 – Jul 2021	3	8	24	78	124	412*

*Additional 39 manuscripts awaiting an initial decision

Table 6. Comparison of review time in days for the past 3 years (data censored on different dates).

Period	5th	25th	50th	75th	95th	Sample Size	Data Censored time	Awaiting initial decisions manuscripts
Aug 2018 – Jul 2019	2	9	20	85	154	364	Jul. 2, 2019	73
Aug 2019 – Jul 2020	5	13	31	99	171	441	Oct. 19, 2020	27
Aug 2020 – Jul 2021	3	8	24	78	124	412	Aug. 18, 2021	39

Table 7. JCR rankings for the recent 9 years.

Year	Number of Journals	Ranking (2-Year Impact Factor)	Ranking (5-Year Impact Factor)
2020	125	76	(1.261)
2019	124	72	(0.968)
2018	123	71	(0.947)
2017	123	71	(0.886)
2016	124	70	(0.899)
2015	123	66	(0.838)
2014	122	44	(1.158)
2013	119	37	(1.226)
2012	117	25	(1.440)

Table 8. SCImago journal rankings for recent 9 years.

Year	Total Number of Journal	Journal Rank	Quartile
2020	257	50	Q1
2019	246	41	Q1
2018	219	41	Q1
2017	196	23	Q1
2016	183	26	Q1
2015	179	20	Q1
2014	179	14	Q1
2013	179	12	Q1
2012	176	19	Q1

most all-time high (1.26 for two-year IF and 1.64 for five-year IF), thanks to the efforts of the former editors, associate editors and contributing authors. On the other hand, the ranking of the journal does not reflect the achievement, partially due to the expansion of the competing journal pool used in the ranking. Various efforts are being made to enhance

our impact factor, including organizing more special issues on emerging topics.

1. Submissions and Acceptance Statistics

Table 1 shows the composition of the manuscripts received in the past 12 months. Table 2 shows a

comparison of the number of submissions and the number of papers accepted during the year. Note that the accepted papers may have been submitted in the years before. Table 3 shows the current status of the papers, grouped by the years the papers were submitted. Table 4 shows the number of submissions by country in the past three years.

2. Manuscript Processing Time Table 5 shows the turnaround statistics of initial decisions for the past three years, with the decision times censored on August 18, 2021. About 75% of the editorial decisions during 2020-2021 take less than 78 days, but 5% take over 124 days.

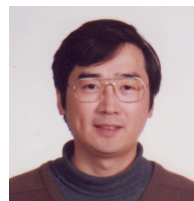
The comparison with the earlier years in Table 5 is biased as we still have 39 papers to be processed and those tend to be landed on the right side of the distribution when completed. In Table 6 we report a more fair comparison, with roughly the same censored time (based on the previous annual reports.) Our processing time is indeed significantly shorter than the previous years.

3. Backlog for Publication In the past year, we have published four issues containing 91 articles. There remain 180 accepted manuscripts waiting to be published. Among them, 24 will appear in the general issue in Oct 2021 and 9 will appear in an online special issue in Oct 2021. The backlog is about 18 months from acceptance to publication.

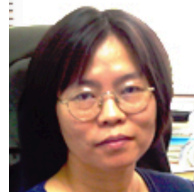
4. Rankings and Impact Factors Table 7 shows the ranks of Statistica Sinica based on the 2-Year Impact Factor and the 5-Year Impact Factor

provided by the Journal Citation Reports (JCR) in the area of Statistics and Probability from 2012 to 2020. Table 8 shows the ranks of Statistica Sinica in Scimago Journal Rankings among all journals of Statistics and Probability in the Scopus database from 2012-2020. The ranking is performed using the algorithm Google PageRank.

5. Special Issue We organized one special issue “In Honor of Professor Tze Leung Lai with Yi-Ching Yao (yao@stat.sinica.edu.tw) and Zhiliang Ying (zying@stat.columbia.edu) as the guest editors. This special issue will be published in Volume 31, Number 5 as an online-only issue.



*Rong Chen , PhD,
Distinguished Professor of Statistics,
Rutgers University.*



*Su-Yun Huang, PhD,
Researcher,
Academia Sinica, Taipei.*



*Xiaotong T. Shen, PhD,
Distinguished Professor,
College of Liberal Arts,
University of Minnesota.*

Report from Statistics in Biosciences

Hongzhe Li and Joan Hu

Statistics in Biosciences (SIBS) is one of the two official journals established by ICSA. The journal is published three times a year in both print and electronic forms. ICSA members can find more information from the website: <https://www.springer.com/journal/12561>

SIBS publishes regular articles and topic-oriented papers in Special Issues. In 2021 the journal has published two regular issues and one special issue on “Statistics in Microbiome and Metage-

nomics” guest-edited by Dr. Huilin Li at New York University Langone Health.

Two special issues are now in preparation for publications. One special issue is on “Machine Learning Algorithms in Genomics and Genetics” guest-edited by Dr. Yingying Wei at the Chinese University of Hong Kong. Another issue is guest-edited by Dr. Lanju Zhang at Vertex and Dr. Naitee Ting at Boehringer Ingelheim on “Leveraging External Data to Improve Trial Efficiency” . The two issues include excellent papers on a wide range of topics in genomics and clinical trial design and anal-

ysis. Please feel free to contact the editors-in-chief if you have interests in proposing new special issues for SIBS.

SIBS initiated the annual Best Paper Awards this year. One or two awards are given each year to the best papers published in SIBS in the previous year. The awards will be presented in the SIBS invited session at the ICSA Applied Statistics Symposium of the year. The winner of the 2021 Statistics in Biosciences Best Paper Award was “Generating Survival Times Using Cox Proportional Hazards Models with Cyclic and Piecewise Time-Varying Covariates” by Yunda Huang, Yuanyuan Zhang, Zong Zhang and Peter B. Gilbert. The 2021 Statistics in Biosciences Best Review Paper Award was awarded to “Assessing Treatment Benefit in Immuno-oncology” by Marc Buyse, Everardo D. Saad, Tomasz Burzykowski and Julien Peron. Congratulations to the winners on their excellent contributions to Statistics in Biosciences!

Professor Hongzhe Li at University of Pennsyl-

vania will finish his term as the Editor-in-Chief at the end of 2021. We are very excited that Professor Hongkai Ji from The Johns Hopkins Bloomberg School of Public Health has been selected as the co-Editor-in-Chief. Professor Ji will start his term on January 1st, 2022.



*Hongzhe Li, PhD,
Professor,
Department of Biostatistics and
Epidemiology, University of
Pennsylvania,
Philadelphia, PA 19104, USA.*



*Joan Hu, PhD,
Professor of Statistics,
Department of Statistics and Ac-
tuarial Science,
Simon Fraser University,
Burnaby, BC V5A1S6, Canada.*

Report for the 2022 ICSA Applied Statistics Symposium

Executive Organizing Committee

The 2022 ICSA Applied Statistics Symposium will be held in person in Gainesville, Florida from Sunday, June 19th to Wednesday, June 22th, 2022 (<https://symposium2022.icsa.org/>). This will be the 31st annual symposium for ICSA. The theme of this year’s conference is Statistical Innovations in the Era of Artificial Intelligence and Data Science. Three plenary speakers, Dr. Jianqing Fan of Princeton University, Dr. Susan Murphy of Harvard University, and Dr. David O. Siegmund of Stanford University, will give keynote presentations, entitled “Measuring housing activeness from multi-source big data and machine learning”, “Inference for longitudinal data after adaptive sampling”, and “Change detection, estimation, and segmentation”, respectively. Dr. Xihong Lin of Harvard University and Dr. Nilanjan Chatterjee of Johns Hopkins University will deliver special invited presentations, entitled “Regression models for understanding COVID-19 epidemic dynamics with integrated data” and “Predictive model building through integration of information across disparate data sources and summary-statistics”, respectively. There will be over 70 invited sessions. In addition, there will be 3 half day and 3 full day short courses, covering topics on analysis of correlated binary data, Bayesian computational tools, causal inference, clinical trials, infection disease modeling, and spatial analysis. Over 500 domestic and international statisticians and data scientists working in academia, government, and industry are expected to attend.

ICSA will offer Student Paper Awards and Travel Grants for outstanding student papers. For any questions, the Student Paper Competition Committee Chair, Dr. Zhigang Li, can be contacted (zhigang.li@ufl.edu). ICSA is also pleased to invite submissions for poster presentations and Poster Award Competitions. The Poster Session Committee Chair, Dr. Guogen Shan, can be contacted for details in the Poster Awards (gshan@ufl.edu).

Executive Committee

- Peihua Qiu (Chair, University of Florida)
- Somnath Datta (University of Florida)
- Zhezhen Jin (Columbia University)
- Ji-Hyun Lee (University of Florida)
- Mengling Liu (NYU Langone Health)
- Tony Sun (University of Missouri)
- Samuel Wu (University of Florida)

Scientific Program Committee

- Samuel Wu (Co-Chair, University of Florida)
- Somnath Datta (Co-Chair, University of Florida)
- Dipankar Bandyopadhyay (Virginia Commonwealth University)
- Jie Chen (Augusta University)
- Xinpeng Cui (UC Riverside)
- Somnath Datta (University of Florida)
- Susmita Datta (University of Florida)
- Adam Ding (Northeastern University)
- Joan Hu (Simon Frazer University)
- Jianhua Huang (CUHK)
- Victor Hugo Lachos Davila (University of Connecticut)
- Hongzhe Lee (University of Pennsylvania)
- Gang Li (UCLA)
- Tapabrata Maiti (Michigan State University)
- Rajeshwari Sundaram (NIH/NICHHD)
- Ming Wang (Pennsylvania State University)
- Samuel Wu (University of Florida)
- Wei Wu (Florida State University)
- Dong Xi (Novartis)
- Gongjun Xu (University of Michigan)
- Hongyu Zhao (Yale University)
- Jun Zhao (Astellas)
- Yichuan Zhao (Georgia State University)
- Kelly Zou (Viatris)

Local Committee

- Ji-Hyun Lee (Chair, University of Florida)
- Kristen Cason (University of Florida)
- Melissa Layne (University of Florida)

Student Paper Competition Committee

- Zhigang Li (Chair, University of Florida)

Short Course Committee

- Susmita Datta (Chair, University of Florida)

Poster Committee

- Guogen Shan (Chair, University of Florida)
- Qing Lu (University of Florida)

Funding Raising Committee

- Jane Zhang (Chair, AbbVie)
- Jessica Cai (Regeneron)
- Pranab Mitra (Takeda)
- Furong Sun (Regeneron)
- Daisy Yuan (AbbVie)
- Alan Wu (Beigene)

Financial/Business Committee

- Guogen Shan (Chair, University of Florida)
- Renee Douglass (University of Florida)
- Rochelle Fu (ICSA Treasurer)
- Deana Nance (University of Florida)

Program Book and Website Committee

- Xiangyang Lou (Co-Chair, University of Florida)
- Qinglin Pei (Co-Chair, University of Florida)
- Yunfeng Dai (University of Florida)
- Hanzhi Gao (University of Florida)
- Chengsheng Jiang (ICSA IT)
- Guanhong Miao (University of Florida)

Student Travel Awards and Jiann-Ping Hsu Pharmaceutical and Regulatory Sciences Student Paper Award

To encourage student members of ICSA to participate and to share their research at the annual ICSA applied Symposium, ICSA offers Student Travel Awards and one Jiann-Ping Hsu Pharmaceutical and Regulatory Sciences Student Paper Award for outstanding student papers.

Eligibility: The applicant must be an ICSA member at the time of manuscript submission, a doctoral degree candidate in any term during the academic year of the symposium at an accredited institute, and be able to register and present the research work at the symposium. The paper must not be published or accepted for publication at the time of submission.

Available Awards: In normal situations, up to six student award winners (five Student Travel Awards, one Jiann-Ping Hsu Pharmaceutical and Regulatory Sciences Student Paper Award) will be selected. Each winner will receive a plaque, an award for travel and registration reimbursement up to \$1000 or a cash award of \$550, whichever is bigger, as well as a free registration for a short course.

Deadlines will be announced by the ICSA and more details could be found at <https://www.icsa.org/awards/icsa-awards-and-honors/>

A Recap of an ICSA 2021 Panel

Victoria Gamerman, Boehringer Ingelheim; John E. Kolassa, Rutgers, The State University of New Jersey; Jim Z. Li, Viatrix Inc.; Fanni Natanegara, Eli Lilly and Company; Kimberly F. Sellers, Georgetown University; Aniketh Talwai, Medidata: a Dassault Systèmes company; Kelly H. Zou, Viatrix Inc.

Editorial: This article is being published with permissions in both *Amstat News* (<https://magazine.amstat.org>; January and February issues, 2022) and *ICSA Bulletin* (<https://www.icsa.org/icsa-bulletin>; January and July issues, 2022). The authors are employees of their respective employers. The views expressed are the authors' own and do not necessarily represent those of the employers.

Collaborations and partnerships can come in all shapes and forms. Martin Luther King, Jr.'s words may resonate: "We may have all come on different ships, but we're in the same boat now." Frequently, sharing of ideas between stakeholders from different organizations leads to exchange visits, support for graduate students, consulting jobs, grant support, and continuing education opportunities for statisticians or data scientists outside of academe. For statistics and data science to be impactful within a broader project, organization or with a specific customer, sharing of ideas and knowledge for the desired outcome is key. The themes discussed here apply broadly with deep implications to the impact and perception of the field. Through this intellectual exchange, statistical and data science problems from

outside academia become use case studies and form key components of the partnerships.

During the 2021 International Chinese Statistical Association (ICSA) Applied Statistics Symposium, several panelists discussed the key elements to form and sustain successful collaborations and partnerships, along with challenges and barriers. The panel had a wide appeal, given the increasing focus on inter-disciplinary research and the emergence of complex and high dimensional data. In particular, such challenges are common in health care research. Three aspects below, i.e., definitions, technical skills and soft skills, can all be valuable to statisticians and data scientists in diverse areas and sectors.

How would you define "partnership" since it may be of many shapes and forms?

According to Fanni, Partnership is an association between two or more individuals to pull together their resources and skills to achieve a common goal. The partnerships that she has seen in her role as a pharmaceutical statistician and as an ASA Statistical Partnerships Among Academe, Industry and Government (SPAIG) Committee member can take many different forms—both formal and informal. Formal partnerships can involve contract signing such as a "master service agreement" (MSA), where academicians partner with industry statisticians to solve a research problem which could end up in method and tool developments, manuscripts, presentations and dissertation topics. This type of partnerships could also involve monetary transactions. Informal partnerships may not necessarily



include monetary exchange and can still produce manuscripts and presentations.

Is “collaboration” the same as “partnership” or not? Why?

John expanded on Fanni’s above comment and sees “collaboration” and “partnership” as separate concepts, and as parts of a spectrum of collaboration intensity. At one end of this spectrum is partnership when the statistician’s name is on every publication, and the statistician contributes to the grant application by planning the analysis and details of data collection, and is involved all the way through the final publications. At another end of the spectrum, a colleague describes a type of data and solicits his opinion on data analysis, experimental pitfalls, and other aspects in order to provide valid scientific reports. Thus, it may be considered as “collaboration”, which is less intense. It is important to keep in mind that many lab science collaborators treat their studies with a more proprietary spirit, and a recognition of this spirit helps to avoid conflict.

What are some benefits of collaborations and partnerships in statistics/data science?

Victoria noted that data science is a varied field, which requires multi-faceted roles. For successful collaborations and partnerships, there are several types of roles to consider and balance, depending on the desired outcome of the relationships: specialists and generalists. The specialization concept is key to finding which collaborator or partner has subject matter expertise on which topic or topics. This expertise strength from one partner should then be paired with another that has a strength in a different and complementary area.

These partnerships and collaborations also allow us to look outside of our own area of expertise and way of thinking to bring together diverse perspectives of how to solve a problem (are we even solving the root cause of the problem we are tackling?) and focusing on the outcome in the short term, with the perspectives of how to scale it either as part of the relationship or further beyond it. This ability to move from use case or single problem solution to generating sustainable solutions that are scalable within one of the partner organizations is where the

benefit of these coming together moments will be seen and valued by all parties involved.

Through this approach of finding complementary expertise, bringing diverse approaches, and valuing short- and long-term outcomes, the pressure of finding a single candidate who is a magical unicorn capable of “doing it all” is not necessary. Instead, organizations can identify external experts related to its needs, work with these specialists through the partner organization, and achieve the desired end goals with broader benefit.

What are some requirements for fruitful collaborations or partnerships?

Victoria emphasized that a key element for the parties involved in the collaboration or partnership is to understand each other’s drivers. For example, one organization may have a greater emphasis on getting regulatory-grade evidence to support a molecule through development while the other organization in the collaboration may have an emphasis on external scientific publications related to the disease area in which the molecule works. Those different motivators and drivers have their place and their merit; and both need to be taken into consideration when defining what a successful collaboration or partnership looks like to see it come to fruition. Having an aligned understanding of what is important to the other parties will allow for an early and proactive assessment of potential challenges that the collaboration partners may face (e.g., which priorities to pursue) and define an approach on how to handle them (e.g., a governance or steering committee).

In Aniketh’s view, below are suggested mechanisms or structures: (1) Establishing formal stakeholder management mechanisms (e.g., governance committees, go vs. no-go, and gating sessions, project charters and contractors) ahead of launch. (2) Adhering to them over the course of the effort provides transparency and lends clarity to scope, contributions, permissions and resourcing. Such an action works to prevent misunderstandings and helps resolve issues before they escalate into conflicts. (3) Adopting a modular, stepwise approach to project delivery, taking quick wins up front and having proof-of-success at each step, as opposed to

trying to solve all the hardest challenges or complete everything perfectly in one go, not only provides for the learning curve needed for all new collaborations but also helps guard against disillusionment leading to premature abandonment of the effort. (4) Having the collective periodically step back and consider the interests of all stakeholders, not just those of the immediate partners, and proactively involve them helps to bring in a diversity of viewpoints and forestall potential constraints.

What are good practices for setting expectations and making plans before embarking on a collaborative relationship?

Kimberly Sellers advised that one of the best practices throughout a collaborative relationship is to offer clear communication and transparency. This includes open discussion about expectations at the beginning of the project and regular follow-up (both verbally and in writing) to ensure all parties are on the same page with regard to project status, issues or concerns, etc. John Kolassa elaborated, saying that in reference to ‘challenges,’ we may find unexpected barriers arise during joint projects and we sometimes pay a price for having projects not live up to our initial expectations. We need to be flexible and willing to overlook each other’s failings if we are to make human relationships, including research relationships, work. It’s also important to understand and predict how much flexibility is in our schedules and to not over-promise. To collaborate, Jim Li suggested beginning with the end in mind after discussing what to do (e.g., a research project) and resource needs (e.g., personnel and budget). The collaborators need to discuss how to carry out the collaboration, including the following:

- What are the deliverables (e.g., reports and publications)?
- How to share the resources (e.g., budget), fruit (e.g., authorship)?
- What governance structure (e.g., steering committee, technical review committee, multiple workgroups) and standards/processes (e.g., guidelines, standard operation procedures, forms, templates) to use?
- How to make decisions, and who makes them, during the planning, implementation, and assessment of the collaboration?

How to navigate through challenges and barriers (e.g., the role, effort, and urgency of

statisticians) via multidisciplinary collaborations?

Fanni Natanegara offered best practices for navigating through challenges and barriers in multidisciplinary collaborations. For the partnership to be successful, each member needs to understand their role and contribution and be accountable for delivering their tasks. Secondly, it is important to build the right infrastructure and process for the collaboration to sustain over time. This could include understanding and agreeing to the what and why by setting up mission and vision statements, a charter document, or simply an objective statement saying the collaborators will work toward a common goal. The how includes laying out the steps the team will follow. This could include setting up regular meetings and conference calls, agreeing on a metric to measure success, and making incremental progress toward the common goal. Finally, Natanegara said she could not overemphasize the importance of communication so everyone is updated on the progress of the project and aware of any new information or ideas that may affect the work. All these points are important to get the project work done efficiently and seamlessly. Kolassa reflected on cross-institutional collaborations. To him, some of the barriers are process-related but compliance-necessary (e.g., human subjects’ approval; multiple institutions often imply multiple human subjects review committees). Bureaucratic steps that arise from the involvement of multiple sectors appear to be a nuisance, but he said comprehensive checks protect us against important ethical dangers. Li referred to project management tools and tasks. He has come to appreciate the contribution of a dedicated person for project oversight, because it is critical that someone takes responsibility for keeping the project on schedule.

How to ensure voices and opinions from a diverse community are heard during collaborative relationships?

When considering the possible contributions different collaborators can make, Victoria Gamerman stressed the importance of discussing beyond the qualifications and desired outcomes, though this is a good foundation and a must. It is also important to share the journey along the way so collaborators can actively learn from each other and leverage the strengths of their partners. Some may bring a new data source, a different analytic approach, or a stakeholder perspective, all of which should add value to the overarching goals of the collaboration. Further, it is important to identify sponsors who can be echo chambers and advocates for the collab-

oration and individuals within it doing the everyday work to make it successful. Sharing successes and pitfalls throughout the collaborative process is an important step for statisticians and data scientists, so those with a different background can take part in data wrangling and insight generation. To an untrained eye, what statisticians and data scientists do may be simple but we, within this community, know what is under the hood better than others. This gives us the important opportunity and responsibility to contribute to the education of our partners or collaborators by sharing the steps along the way (perhaps summarized), using the data to tell a story of both the end result and intermediate processes. Sellers suggested collaborators seek out representation from diverse communities and invite those with differing backgrounds and perspectives into the collaborative relationship. It is easy to gather people with similar mindsets and backgrounds because one may perceive this would lend itself to a smooth experience. Such an approach, however, can be problematic because even the most innocent operations can produce adverse effects or have unforeseen/unintended consequences. Thus, it is helpful to gain heterogeneous feedback and insight throughout the collaboration. Furthermore, Natanegara stressed the importance of finding an ally to make sure your voice is heard in meetings in which key decisions are made. An ally will be able to support your voice or bring you and your ideas to the discussion table. To build an alliance, you could set up one-to-one meetings with key stakeholders to share ideas prior to the team meeting. Based on these one-off meetings, you can refine your ideas and be prepared to bring them to the meeting. The reverse is true if you are in a senior or leadership position. Be that ally to your

junior or newer colleagues. If you see someone struggling to get their opinion heard in a meeting, then be the voice for that person and confirm what they are trying to convey so the rest of the group can hear and understand.

What are the top one or two skills you would suggest for making collaborations and partnerships fruitful?

Aniketh Talwai has found it helpful to think of partners/collaborators as the participating people, not just their respective organizations (e.g., universities, companies, etc.), Identify and proactively enlist the support of your counterparts in partner organizations who have both the ability to and interest in championing and driving the project internally. Second, while good communication skills help drive the success of nearly every project, those who are managing partnerships and collaborations will likely benefit from being particularly diligent in tailoring communication styles to different audiences. Kolassa commented that it is interesting to explore the role of ‘service’ in the sciences. Many of us might see ourselves as providing a service but, in many ways, people performing experiments and providing project leadership are also providing a service. It’s also important to primarily engage in projects we see as valuable; it’s particularly important for junior faculty to have the flexibility to avoid taking projects only to fill a support quota. Finally, Li reemphasized that communication skills are crucial for a collaboration or partnership to be successful. Overall, both technical and soft skills are important to being effective collaborators in a fruitful data science or statistical partnership.

COVID Coping and The Law of Most People

Xiao-Li Meng

Editorial: This is a reprint from an article published in the *IMS* <https://imstat.org/2020/03/31/xl-files-covid-coping-and-the-law-of-most-people/>) with IMS’ permission.

The arrival of COVID-19 has ignited global anx-

ity about how we deal with uncertainty and risk. Uncertainty blurs our collective vision, and risk takes our breath away—alas, sometimes literally. Since we statisticians and probabilists have always been proud of being at the forefront of studying uncertainty and risk, two questions naturally arise. First, in our daily lives, are we coping with uncertainty and risk better, on average, than are people

in other professions? Second, how can we use our knowledge and expertise to help others during these unprecedentedly unsettling times?

Regarding the first question, I am unaware of any study. But being a statistician, I can offer my $n=1$. You can then add yours, so we will have a chance to claim replicability. I suffered from aviophobia for a while. Any turbulence or unexpected noise during a flight would immediately wet my palms (thank God, only my palms). I am now cured (almost surely) thanks to (A) a psychologist's suggestion to listen to music, (B) some poorly written theses, and (C) my statistical sanity. I gather (A) requires no elaboration, other than that its essence is to distract my fearful mind; (B) then comes in handy, especially for very long flights. I still recall how I wished desperately for a 14-hour flight to China not to land while I was still "red-inking" the final chapter. The ultimate cure, however, came from (C), when I finally internalized the fact that flying is far safer than any other means of transportation that I take, yet none of the others had triggered any fear. Therefore, it would be insane for me as a (reputable) statistician to fail to reason myself out of aviophobia.

Each of us lives in fear during some periods of our lives—fear of losing a loved one, of a terrible diagnosis, of major financial or reputational loss, not to mention the fear of rejection in its various guises. Humans seem to be biologically wired to give irrationally high weighting to extreme outcomes when we contemplate decisions under uncertainties, whether those outcomes are desirable (winning lotteries) or disastrous (plane crash). In the current crisis, fear of the worst outcome may motivate some of us to wash our hands and practice social distancing with more seriousness. But it can also put excessive strain on others, depriving them of their sleep and weakening their immune systems. A healthy mental state is always about moderation and balance: be prudent but not frightened.

Since I overcame my aviophobia by drawing upon the resource of statistical sanity, reflecting upon "The Law of Most People" has been therapeutic whenever I fear my fear is going to consume me. This law stipulates that the worst fears (or best dreams) of most people cannot be realized. This simply restates that extreme tails of a distribution have far less mass than the middle portion. (When tails have more masses than the middle portion, then the phrase "extreme" loses its meaning.) The thought that I am most likely to be one of the "most

people" provides the firewall I need to keep my anxiety at bay, permitting me to live without excessive fear. Please help to spread this free self-help pep talk faster than any virus can, as you, my fellow uncertainty experts, know far better than others that it will apply to most of the people you talk to (except you won't know to which ones). And that suggests a partial answer to the second question.

The other part of the answer comes from a mix-up that may have already irritated you: I have mixed population frequency with personal probability. But this is an unavoidable mix. All numbers reported about COVID-19 are for measuring population risks, from infection percentages to the risk of death. But as individuals, we tend to focus on individual risks. What's the chance that I will get infected? What's the chance that a loved one will die from COVID-19? Whereas population percentages and risks are easy to define—but not easy to estimate, especially given all kinds of dark data [see the previous XL-Files]—individual risks are a much more nuanced concept. What does it mean that my chance of infection is 5%? Does it mean that I will get it if I shake hands with 20 virus carriers? Or by taking 20 flights?

We, the uncertainty experts, can help others understand the concept of their individual risk, and that this can be quite different from what they read online, depending on which sub-population they judge themselves as belonging to. Careful consideration of individual risk can control extreme thoughts that may lead to reckless behavior or excessive fear. Dealing with uncertainty and fear is never easy, but having an informed and rational internal dialogue can tame our ill-considered impulses or catastrophizing tendencies. We can all help others to conduct such internal dialogs. The process of helping others is also therapeutic in and of itself. The more our minds are engaged in helping others, the more easily we will get through this most stressful time of our lives. May our community of statisticians and probabilists draw strength from the inherent sanity of our discipline, and energy from the opportunities we have to help others.



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COVID-19: A Massive Stress Test With Many Unexpected Opportunities (for Data Science)

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When I conceived my first editorial title this year, “2020: A Very Busy Year for Data Science (and Scientists),” COVID-19 was an unknown term to me. Had I been given any hint of its potential for tormenting the human society, I might have at least contemplated the possibility of ‘an unexpected year for data science.’ Indeed, not just the challenges but also the opportunities fall into the category of the unexpected.

All COVID-19-related challenges are virtually the same in nature: a massive stress test on a global scale. The pandemic pushes essentially every system to its extreme, exposing the good, the bad, and the ugly of its inner workings. It tests each system’s resilience (or lack thereof) as a well-functioning integrant of the human ecosystem. We have seen this stress test being conducted in public health and medical systems; in social and economic systems; in political and administrative systems; in law enforcement and regulatory systems; in educational systems; in production and supply chains; and in tourism and service industries, just to name a few of the most obvious ones. I am sure that each of you have your own extensive list, which may vary a great deal depending on your locality, in the physical, cultural, and social senses of the word.

Thinking more positively, the mantra ‘never waste a crisis’ exhorts us to make the best out of the unprecedented global experiments foisted upon us by COVID-19. Consider the study of environmental impacts of human activities. Imagine a global A/B test that imposes home confinement on the vast majority of human beings for a month and then measures the reduction of the carbon footprint compared to that from the preceding month. Prior to COVID, would anyone in their right minds have actually proposed such a research plan to an Institution Review Board (IRB), much less a government or funding agency? And yet, we have now been liv-

ing out exactly this scenario for more than a month. How could we possibly waste such an otherwise unthinkable opportunity, especially when it comes at the incalculable cost of the many lives and livelihoods destroyed? Is there not a better way to try to make all this suffering count?

This opportunity to study environmental impact is merely one of the many extreme social experiments in progress that would have otherwise been deemed inconceivable, unfeasible or even unethical. Again, just to list a few obvious global scale studies that have presently become possible: the effectiveness of working from home (and the impacts of this on work-life balance); the utility of virtual education or home-schooling versus that of classroom-based learning; the impact of social isolation on mental health and personal relationships; the consequences of establishing societal control regimes and human monitoring versus protecting individual autonomy (and privacy); a global comparison of public health and medical (insurance) systems, as well as political, regulatory, legal, and economic systems. Even for experiments that would otherwise be possible, the pandemic may still provide the best window of opportunities to implement them. The article by Alexander Podkul, Liberty Vittert, Scott Tranter and Alex Alduncin on learning about public understanding of exponential growth is an excellent example. As the authors rightly conclude, “One often laments that the general population does not have the time or resources to understand the data science behind social scientific concepts—this is a rare scenario in which most now have both.”

Whether meeting challenges or leveraging opportunities, data scientists have both the expertise and professional obligation to play vital roles. This call to action is highlighted and well summarized by the two panel discussions featured in this special issue. The first features eminent biostatisticians and epidemiologists, and the second, leading economists, sociologists and operation researchers. As summarized by the second panel, “Data science will be useful in estimating prevalence and in analyzing the ongoing natural experiment on pandemic response, in which different counties, states and countries are taking different approaches and implementing these

at different stages of community penetrance. “

Data scientists are vital for a very simple reason. None of the aforementioned investigations can be meaningfully carried out without quantitative investigations, whether in the forms of risk and uncertainty assessments, data collection, processing, and analysis for reaching experimental conclusions, or effective data visualization and communication to maximize impact. Executing these tasks, however, becomes extremely daunting in the context of a global public health crisis. They require swift, unprecedented, and concerted efforts from the data science community, as I have already witnessed and experienced from organizing this special issue. We find ourselves in a perfect storm.

Perfect Storm

Carrying out a serious data science project is never easy; any data scientist who has gotten their hands dirty could prattle on for hours, if not days, about their knotty experiences. The typical sources of frustration and difficulty come from the so-called ‘Five Vs of Big Data’ : Variability, Variety, Veracity, Velocity, and Volume. It’s fortuitous that ‘Variability’ comes first in their alphabetical ordering (and perhaps even more so considering that, as a ‘meta-variability’ reminder, the lists of ‘Vs’ one can find online have a large variability, from 3Vs to 42Vs!). As I discussed in my previous editorial, broadly speaking, data science is about discerning which parts of the variation, or variability, are signal and which are noise. In the context of understanding the COVID-19 pandemic, the grand challenge is to be able to make such distinctions from a large variety of extremely low quality data, and we must make the call now. That is, the first four Vs are interacting in the most challenging way imaginable: dissecting variations in a large variety of data is a daunting task even when they are completely trustworthy and time constraints are not an issue. (Ironically, the fifth V, Volume, a popular indication of ‘Big Data,’ is scarcely an issue for COVID-19.) But COVID-19 data are anything but trustworthy for the purposes of societal and population-level planning. We also must race against the spread of the virus—waiting for an encompassing plan next week may result in more lives lost than adopting a reasonable partial solution today.

COVID-19 thus is also a massive stress test on data scientists, because it creates a perfect storm for data science. We are given extremely dark data, bafflingly complex problems, very little time, an enormous number of affected stakeholders, and life-or-death consequences. The phrase ‘unprecedented

challenges’ is often used with this or that theatrical intention, but in the current case it does not even capture the trying tasks we data scientists have taken upon ourselves. In my three-decade involvement in editorial work, from serving as a reviewer to Editor-in-Chief, this is the first time I have received messages from the authors such as, “This has been an intense effort (one that almost brought me down, actually, though alas I prevailed),” or “students and I met at 8 p.m. every evening for two hours in the past 10 days!” or “The speed of things is scary and I am worried about the stress this mad rush is putting us through.”

The mad rush contrasts with the “intellectual’s otherwise punctilious rhythms,” in the words of an author featured in this special issue. The ‘punctilious rhythms’ of scholarly work are typically the result of the time that serious researchers and scholars take to contemplate, compare, contrast, confirm, etc., even or especially when they apparently have achieved their goals. Such rhythms are particularly crucial for data scientists, because it is too easy to ‘get a result’ in the data science space. With so much at stake for the current pandemic, and with so many stakeholders anxiously waiting for almost any kind of information, the potential dangers posed by such ‘results’ simply cannot be overstated.

Extremely Dark Data

The vast majority of COVID-19-related studies published or posted up to now have been conducted far more thoughtfully than mere exercises of software-driven number crunching. Yet even thoughtful work can be dangerous when investigators do not take into account the extremely low quality of most of the available COVID-19 data. Building elaborated epidemiological or mathematical models without taking into account the weaknesses of the data generating mechanism is still statistically unprincipled, because data quality fundamentally trumps everything else. A vivid demonstration of this was provided by Walter Dempsey, in a tweet he posted on April 5, 2020 (@walthdempsey), using an identity I published in 2018 in *Annals of Applied Statistics*. (I generally avoid citing references in my editorials other than the ones being featured in HDSR, but the source of the identity is needed here because the mathematical proof it contains compels us to accept the seemingly impossible fact below.)

Assuming merely a half-percent data-selection correlation (between testing positive and being tested), Dempsey shows that selectively testing 10,000 people for SARS-CoV-2 in New York State

is statistically equivalent to testing about 20 individuals randomly for the purpose of estimating the positive rate in New York State. This is a 99.8% loss of sample size, a quantification and qualification of the term ‘extremely low quality’ or ‘extremely dark’ data, since we have very little reliable data to carry out the usual statistical procedures that would otherwise rely on the input data forming a representative sample of our target population. Indeed, as Dempsey emphasizes, the half-percent data-selection correlation is likely an underestimate for COVID-19 testing because the selective testing is not induced by individual behaviors but explicitly imposed by government and health organizations due to the shortages of available tests.

Selective testing is necessary for medical purposes and for saving lives when there are not enough tests available. But studies that use reported positive cases from such samples without adjustment for estimated population infection rates would be seriously misleading in general, and the more selective testing we do, the more liable we are to mislead ourselves. This would lead to a host of problems, for example, extremely narrow confidence intervals, almost certainly missing the target. That is, we would be trapped by the ‘Big Data Paradox’ — the more data, the surer we fool ourselves, as discussed in the aforementioned 2018 article.

To make matters far worse, selective testing is just one of many data quality problems for analyzing COVID-19 data, and it is the easiest or, at least, the most visible one to deal with. For anyone who wishes to gain an overall picture of the troubled COVID-19 data landscape, the article on identifying biases in estimating COVID-19 case fatality rate (CFR) by Anastasios Nikolas Angelopoulos, Reese Pathak, Rohit Varma, and Michael I. Jordan in this special issue is an essential read. Their graphical model, with over a dozen nodes, depicts vividly the nature of the many-headed beast of COVID-19 data complications. They categorize these complications approximately into five sources of bias: under-ascertainment of mild cases, time lags, interventions, group characteristics, and imperfect reporting and attribution. They also provide an extensive (but by no means exhaustive) discussion of the magnitude and direction of the biases caused by these sources. They rightly emphasize that the total error of any estimator, however perfect for addressing some of these biases, cannot be determined without seriously improving the data quality (e.g., via random testing) because these biases may go in opposite directions, leading to partial cancellations.

As an example of the change of direction in the

bias, we may note that before the symptoms and risks of COVID-19 were widely understood and well-popularized, deaths due to COVID-19 were likely to be misclassified, and postmortem tests were rarely performed or even possible. But by now, if someone tested positive for COVID-19 and then died, it is much more likely that the death would be counted toward COVID-19 mortality, even though that person could have died in the same period from causes other than those related to the infection. This is especially the case for members of vulnerable populations. Whereas death attribution in the presence of competing risks is never a trivial matter, the task of properly assessing the excessive mortality rate due to COVID-19 is of great importance for local and national planning. For example, it is essential for figuring out when and how to end the lock-down—a situation which can, in itself, have devastating consequences (e.g., for those who need timely medical attention for non-COVID-19-related conditions). Unfortunately, modeling COVID-19 dynamics with competing risks has not been “at the forefront of what the epidemiological modelers are considering,” as pointed out in the aforementioned first panel conversation. This conversation touches upon a wide range of testing-related issues (such as PCR versus serologic tests) as well as other topics like vaccines and treatments. The panelists also broach other research-based challenges, emphasizing, for instance, the importance of collecting better data and using more comprehensive models for assessing the impact of COVID-19 on health care and social and economic systems.

The issue of economic and social impact is the focus of the second panel conversation, which explores some long-term, even potentially permanent, implications (e.g., on telemedicine, or increased working from home). The second panel also echoes the first panel in calling for better estimates for epidemiological modeling: “for this we need disease and antibody testing on representative samples of the population.” This sentiment was further stressed by another article in the special issue. Ray et al. document the heroic efforts of a data science team to help the government of India to decide on the duration of the country’s lockdown period. These authors emphasize the “pivotal role of increased testing, reliable and transparent data, proper uncertainty quantification, accurate interpretation of forecasting models, reproducible data science methods, and tools that can enable data-driven policymaking during a pandemic.”

Timely Impact and Time-Honored Rigor

All the challenges discussed above condense into a sort of meta-challenge for (data) scientists: how best to maintain scientific rigor under extreme time constraints? What I have observed during the process of organizing this special issue is beyond heart-warming, and it gives me great hope that collectively we can have a timely impact while preserving time-honored intellectual rigor. Authors, editors, and reviewers all put in the kind of efforts that, during normal times, would be considered unachievable or even unimaginable. Specifically, given the time-sensitivity of the issue at hand, HDSR invited reviewers to complete their reviews within one week, regardless of how technical a submission was. While one week might be considered as normal pace for some fields, for data science journals it is virtually unheard-of. Considering the constraints on everyone, especially the experts we needed, the board members and I initially sent review requests to more people than needed in anticipation of declination. To our pleasant surprise, nearly everyone invited responded right away, and almost all of them provided reports within a week. Many reports were of great depth and posed challenging questions, from quality of data to choices of investigative approaches or models, and from effective communication of findings to careful considerations of policy implications.

This, in turn, puts extraordinary pressures on the authors, with some articles receiving a half dozen detailed reports in one week. Whereas some authors characterized the collection of the reports as being ‘excessive’—and it is by any normal standard both in terms of the quantities and asks—authors put in even more extraordinary effort in addressing all comments, and they did so within 1-2 weeks. Frankly, I was not expecting that all the authors would be in a position to address all the comments, given their ‘excess’ and the time constraints. I was therefore prepared to serve as a ‘mediator’ between some authors and reviewers, since if there was ever a particular time to stress the aphorism ‘let not the perfect be the enemy of good,’ this would be it. To my great surprise (and relief), my mediation skills (such as they are) were not needed at all. The authors did such a thorough job that the reviewers were deeply impressed, and some of them apparently were as pleasantly surprised as I was.

For example, David Leslie’s article on tackling COVID-19 through responsible AI innovation tripled its content and now has over 200 references. One reviewer reacted to this expansion: “It is much more grounded in evidence, has a solid thread of argument—improved by orders of magnitude.” An-

other remarked, “I am not sure if I have ever seen such a big difference between two paper drafts.” This is by far the longest article in HDSR so far, and while length is not a good measure for substance, Leslie’s article is truly a treasure for anyone cares about ethical issues in AI and data science. It even comes with a fascinating appendix on ‘The Normative Dimension of Modern Scientific Advancement,’ depicting the normative-historical perspective the author took in explaining “how the successful development of a particular set of inclusive and consensus-based social practices of rational problem-solving carried out in the face of insuperable contingency has relied upon a corresponding release of the moral-practical potentials for cognitive humility, mutual responsibility, egalitarian reciprocity, individual autonomy, and unbounded social solidarity.”

The article by Angelopoulos, Pathak, Varma, and Jordan on estimating case fatality rate (CFR) went from addressing only the issue of time lag to providing a much more comprehensive roadmap for identifying all kinds of biases in the COVID-19 data and their likely magnitudes and directions, earning the praise that, “it’s a *significant* improvement from the previous version” (emphasis is original). Ray et. al’s article received six anonymous review reports, and the authors provided a 33-page point-by-point response, the most substantial one I have ever seen, as echoed by another reviewer: “The effort the authors put in to the review was herculean. One of the most comprehensive response to reviewers I have ever seen.” With the permission of the authors and reviewers, we will post the 33-page response online, together with some other great comments and responses, demonstrating, at least partially, the tremendous efforts made by authors, reviewers, and editorial members. More importantly, these comments and responses should help readers, especially future data scientists, to understand better the intense, under-the-hood processes of producing and publishing rigorous data science through dialogue-driven scholarly exchange, critical evaluation, revision and expansion. In particular, they illustrate how experts push each other vigorously to seek bigger pictures, deeper contemplation, broader impact, clearer acknowledgment of limitations—all integrated components of scholarly work and, more broadly, of intellectual pursuits of the highest caliber.

But There is No Free Lunch

No matter how hard we work and how desperately we desire a particular outcome, we must also understand and accept the fact that there will always be

limits that we cannot surmount. Understanding limitations and boundaries is a key telltale marker of the difference between experts and novices. For example, there is a mad dash around the globe right now to create vaccines for COVID-19 by people and entities with various motivations, capabilities and resources. Yet the vast majority of experts, including those participants on the first panel, are telling us that we are at least 18 months away from seeing vaccines available for general public. There are at least three broad lessons we can draw from this reality, especially for the data science community, most broadly conceived.

The most obvious (yet often sidelined) lesson is that scientific processes and products must be approached with a due respect for their own internal rules of development and maturation. Admittedly, forces such as willpower, passion, and fear all have their critical equatorial roles in the human ecosystem. For example, when we want or avoid something badly, our will power will drive us to put in maximal effort and prioritize measures of attainment or avoidance to the extreme—the current global lock down is a perfect illustration. Yet there will be boundaries that we simply need to respect, regardless how omnipotent we may believe ourselves to be. In vaccine development, a key limitation is our theoretical understanding of how a vaccine will actually work in the wild when released into the general population, and hence we must conduct the time-consuming and diligent clinical trials, a point I shall discuss more shortly.

For the data science community, the limitation of the data is one fundamental boundary we must respect. Anything beyond the boundary requires a potentially hazardous leap of faith. There is simply no free-lunch. Any time that we think we are enjoying a free lunch, we deceive ourselves either because we didn't realize that we actually have paid for it (e.g., in the form of uncheckable model assumptions) or that someone else has paid for it (e.g., using prior information built on a previous study). The aforementioned article by Ray et al. illustrates vividly how one can use model assumptions and previous studies (e.g., on earlier SARS outbreaks) to circumvent the limitation of the COVID-19 data. Explicitly recognizing assumptions made and information borrowed is essential for assessing the reliability and validity of our results, because they depend critically on how reasonable our assumptions are, and how relevant the borrowed information is.

The second lesson is the critical importance of theory, or at least theoretical guidelines, especially when we need answers under stringent time con-

straints. As mentioned above, a key component of the lengthy waiting period for vaccines is the clinical trial. Clinical trials are very expensive and time-consuming, and the success rates for vaccines are among the highest when compared to trials in other disease areas such as cancer, as demonstrated by Andrew W. Lo, Kien Wei Siah and Chi Heem Wong in their timely article on estimating probabilities of success of vaccines and other anti-infective medications. Nevertheless, they are still typically below 40% even for the most resourceful vaccine developers. Clinical trials are currently the gold standard for establishing the effectiveness of preventative and therapeutic medications. But this very fact reflects the fundamental limitation of our theoretical understanding of how a medication will work in a general population, despite the tremendous progress we have made in biomedical, life, and behavioral sciences. Though this is a major bottleneck in our quest for the speedy development of any vaccine, it is also—to mix metaphors—an essential backstop that prevents an overstretching of the limits of research capabilities and human understanding. We must test vaccines out empirically and with established and reliable clinical methods. There is simply no short cut in this process, if we want to conduct our trials scientifically, statistically, and ethically.

For the data science community, these kinds of bottlenecks perhaps are best understood by comparing how an expert versus a novice approaches modelling. Equipped with good background knowledge and theoretical understanding, experts would not need to waste time on trying out inferior models or methods; but novices, who have to rely on trial and error to discover what works, have no such recourse to experienced judgment. No statistician would (knowingly) fit an ordinary linear regression to a binary outcome, but a novice might or even might try to defend such a choice (as happened in a local data science seminar several months ago).

A less trivial example is the potential use of black-box algorithms to discover patterns that relate to the etiology of a disease like COVID-19. Using opaque algorithmic techniques may be necessary in areas we know very little about, but that's exactly because we don't yet have sufficient theoretical understanding of these areas. Pattern-learning empirically in complex situations requires a lot of data to do well, but in the case of a pandemic, we hope to have as few 'training samples' as possible. With lives and livelihoods at stake, we neither have the time nor the desire to try and err with unreliable quick-fixes where the problem itself calls for the sensible pursuit of skilled data science. Sound theoretic-

cal understanding and insight is essential for timely, quality decision and actions. Hence we should push for more theoretical knowledge in everything we do, especially in areas where solely empirical investigations have been prevalent.

Indeed, many of the studies on assessing the current pandemic were put together quickly, thanks partially to the theoretical epidemiological framework of the SEIR model and its various extensions; see the aforementioned articles by Ray et al., or the article by Shomesh Chaudhuri, Andrew W. Lo, Danying Xiao, and Qingyang Xu on Bayesian adaptive clinical trials for anti-infective therapeutics during epidemic outbreaks. These trials have the potential to speed up the drug approval processes but with the theoretically understood and controlled trade-offs between false positive and false negative errors. At the same time, the popular theory for the SEIR model is a deterministic one, which fails to capture all the uncertainties in our data (especially because of their extremely low quality) or in our modeling configurations (e.g., the basic reproduction number). This in turn forces us to conduct sensitivity studies to check how robust our results are given these uncertainties and configurations. All these endeavors take time and resources (but these labor-intensive commitments should not be prohibitive), hence the more well-developed theory we have, the faster we can make progresses.

I also want to emphasize that by ‘theory,’ I do not mean merely mathematical or scientific theory. David Leslie’s article, mentioned previously, demonstrates the crucial role that philosophical, ethical and social theories can play in guiding responsible AI innovation for tackling COVID-19. An interdisciplinary and holistic approach that integrates many different streams of theoretical understanding can only enrich the insights of the data science community and bolster its contributions to confronting the complex set of clinical, epidemiological, and socio-economic problems that surround the pandemic. In a broader sense, as data scientists, we can greatly sharpen, expand, and strengthen the many valuable perspectives that already comprise the cross-disciplinary character of data science by reflectively integrating them with even more from the humanities and the social sciences. This is a considerable challenge but also an exciting opportunity that still lies ahead of us.

The third lesson is the importance of having well-defined metrics for assessing and evaluating success and failure. All clinical trials have or should have clearly pre-specified end-points. Whereas the nature of these endpoints may vary, they must be

predetermined to prevent cherry-picking, or over-fitting, to use a data science term. A recent conversation with a leading physician fighting the COVID-19 pandemic reminded me how important such pre-specifications are to medical experts. An almost last-minute switch of the end-point of a recent COVID-19 treatment trial from preventing fatality to shortening recovering time for the survivors made this physician and his colleagues highly skeptical about the treatment’s efficacy. They should, of course, have trepidation. When so much is at stake, there are all sorts of motivations and incentives that seduce us to make premature or otherwise misguided declarations of success. But regardless of whether our motivations are noble (e.g., saving those in desperate need) or evil (e.g., making a quick profit irrespective the risks of harming human life), how a treatment actually works is not at the command of our wishes. Whatever time it takes to understand a treatment and to ensure it works will simply have to be taken. Any attempt to push for faster ‘success’ via manipulation of processes or products—other than efforts to improve the trial object (treatment, vaccine, method, etc) itself—is both unethical and dangerous.

The fact that the medical community is taking time to develop COVID-19 vaccines by following well-established scientific protocols should give us more confidence in their ultimate effectiveness, despite the painful waiting period. On a smaller and more minor scale, the same can be said about the greatly revised articles in this special issue. Whereas the revision process may have been painful or even brutal for some authors, the end products that we see in this special issue are likely among the most trustworthy and informative data science work on COVID-19 available now and in the near future.

I’d like to conclude this special editorial by offering my heartfelt thanks to all the people who have made this special issue possible, and my best wishes to everyone for maintaining the most sound mind (and sleep) during this globally stressful time. I also want to invite everyone to check out this special issue on a weekly basis, as we roll out more COVID-19-pertaining articles, for as long as it takes. But let’s also hope (and pray) that it will not take too long! Until then, stay connected, albeit not physically.



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A dispute in science – and a goodbye

Hans Rudolf Künsch

As traveling abroad was complicated last summer, I went hiking for a week in a mountain area very close to Zurich where I live. During that trip I visited the Unesco natural world heritage site Sardinia area where phenomena associated with the formation of mountain ranges and plate tectonics are visible also for lay persons. The most striking phenomenon there is the so-called "Glarus thrust", sharp straight lines separating two different types of rock over several kilometers. More than 200 years ago the attention of scientists was first drawn to these rock lines when they realised that the rock above the line is about 200 million years older than the one below. This contradicted the then current theory that younger rock layers are always above older ones. To explain this finding two theories were developed: The "thrust" theory postulated that the older rock was pushed from below over the younger rock. However, forces which could achieve such a gigantic move were unknown and the geologist who had come up with this postulate concluded "Nobody would believe me, they would take me for a fool". So the "folding" theory postulating two rock folds which tilted and enclosed a layer of younger rock became dominant. Albert Heim, a leading geologist in the second half of the 19th century strongly publicized the "folding" theory, ridiculing scientists who criticized it. But after two decades Heim acknowledged in 1903 that he had been mistaken and that the "thrust" theory was correct. The force causing this thrust is the collision between the African and European plate. I don't know how established the idea of such a collision was at the beginning of the last century: Alfred Wegener published his theory of continental drift in 1912 and it was not fully accepted until the 1960s.

There are several reasons why I tell this story in my column. First I find it fascinating how science can unfold the history of the earth which involves time scales and processes beyond ordinary human conception. Although it does not seem that statistics has played a role in this dispute, there are many connections between statistics and earth science. Let me mention only two: Harold Jeffreys (1891 - 1981), known for Jeffreys' prior, was not only a Bayesian statistician, but in the first place a geophysicist. Geoffrey Watson (1921-1998), known for the Durbin-Watson statistic and the Nadaraya-Watson kernel estimator, did fundamental work on

directional statistics which he applied among other things to support Wegener's theory of continental drift. Second, I think the story is a nice illustration how errors in science arise and how long it can take until they are corrected. Disputes among scientists unfortunately are not always carried out in a fair and objective manner. Apparently, Albert Heim had a dominant personality which must have made it difficult for him to acknowledge that he was wrong. But to his credit he did it fully and without excuses, supporting afterwards the correct explanation wholeheartedly. In statistics, there are also disputes and controversies which cannot be resolved by simply checking a mathematical proof. Among them I consider currently: Which concepts should be used to complement or replace p-values ?, What methods are best suited for causal inference and what are their limits ?, or What is the best explanation of the apparent success of deep neural networks ?. I hope some light will be shed on these questions in the coming years and people will be willing to reconsider their convictions when this happens.

With this piece I say goodbye to the readers of the ICSA Bulletin. I have written twelve times on various topics myself and my former student Marcel Wolber wrote once on applied statistics. I often gave historical information because I like history since I was a child (I even considered studying archeology instead of mathematics) and because I believe that history can give a human touch to our abstract subject. My first column was a fictitious story ("Lemma 1 was false") about a mistake in a PhD thesis overlooked by the supervisor and the other examiners. So my last column complements the first one, pointing out that not only PhD students make mistakes, but also full professors with a big reputation. Moreover, there is an indirect connection of the story here with my earlier piece on gender ("Careers and personal relationships"): Albert Heim's wife, Marie Heim-Vögtlin, was the first woman in Switzerland to become a medical doctor. She had to fight to be admitted to university and to be allowed to practice medicine in Zurich. At that time, as a married woman she needed by law also the permission from her husband to work. Fortunately he granted it.

The title of this column was "Hints from Hans". I hope this title or my writings didn't give you the impression that I am a wise old man who knows everything and whose views and opinions are always correct. I would be happy if you enjoyed some of my stories and if I could nudge you to think about some

issue you didn't pay close attention to before. I wish you a successful and fulfilling career in statistics.

References for more information about the topic of this column:

1. <https://unesco-sardona.ch/en/homepage> (Sardona world heritage)
2. <http://www.economics.soton.ac.uk/staff/aldrich/jeffreysweb.htm> (Harold Jeffreys work in statistics)
3. R. J. Beran, N. I. Fisher (1998), A conversation with Geoff Watson. *Statist. Sci.* 13(1),

75-93.



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Upcoming Events

Please find below a list of upcoming ICSA meetings and co-sponsored meetings. This list also appears on the ICSA website. If you have any questions, please contact Dr. Mengling Liu, the ICSA Executive Director (executive.director@icsa.org).

ICSA Sponsored Meetings:

ICSA 2022 Applied Statistical Symposium

June 19 - 22, 2022

The ICSA 2022 Applied Statistics Symposium will be held at University of Florida, Gainesville, FL on June 19 - 22, 2022. Detailed information is available at <https://symposium2022.icsa.org/>.

To encourage student members of ICSA to participate and to share their research at the annual ICSA applied Symposium, ICSA offers **Student Travel Awards and one Jiann-Ping Hsu Pharmaceutical and Regulatory Sciences Student Paper Award** for outstanding student papers.

Eligibility: The applicant must be an ICSA member at the time of manuscript submission, a doctoral degree candidate in any term during the academic year of the symposium at an accredited institute, and be able to register and present the research work at the symposium. The paper must not be published or accepted for publication at the time of submission.

Available Awards: In normal situations, up to six student award winners (five Student Travel Awards, one Jiann-Ping Hsu Pharmaceutical and Regulatory Sciences Student Paper Award) will be selected. Each winner will receive a plaque, an award for travel and registration reimbursement up to \$1000

or a cash award of \$550, whichever is bigger, as well as a free registration for a short course.

Deadlines will be announced by the ICSA and more details could be found at <https://www.icsa.org/awards/icsa-awards-and-honors/>

ICSA 2022 China Conference

July 1 - 4, 2022

The ICSA 2022 China Conference will be held at Xi'an University of Finance and Economics, Xi'an, China, July 1-4, 2022. For information, please contact Scientific Program Committee Co-Chairs Professor Yingying Fan at fanyingy@marshall.usc.edu and Professor Chunjie Wang at wangchunjie@ccut.edu.cn.

ICSA 2023 China Conference

Date/Time is pending

The ICSA 2023 China Conference will be held at Chengdu, co-sponsored by Southwest Jiaotong University (SWJTU).

12th ICSA International Conference

December 18 - 20, 2022

The 12th ICSA International Conference will be held at the Chinese University of Hong Kong, Hong Kong, from December 18 to December 20, 2022. For information, please contact Scientific Program Committee Chair Professor (Tony) Jianguo Sun at sunj@missouri.edu or Co-Chair Professor Xingqiu Zhao at Xingqiu.Zhao@polyu.edu.hk.

ICSA Co-sponsored Meetings:

If you have any questions, please contact Dr. Mengling Liu, the ICSA Executive Director (executive.director@icsa.org).

The 8th Workshop on Biostatistics and Bioinformatics

Postponed to Spring, 2022

Atlanta, GA.

Biostatistics and Bioinformatics have been playing key and important roles in statistics and other scientific research fields in recent years. The goal of the 8th workshop is to stimulate research and to foster the interaction of researchers in Biostatistics & Bioinformatics research areas. The workshop will provide the opportunity for faculty and graduate students to meet the top researchers, identify important directions for future research, facilitate research collaborations. The workshop will be held at Atlanta, GA.

A keynote speaker is Dr. Nilanjan Chatterjee, Bloomberg Distinguished Professor of Biostatistics and Medicine at the Johns Hopkins University.

For detailed information including registration, please refer to <https://math.gsu.edu/yichuan/2020Workshop/>.

IMS Asia Pacific Rim Meeting

Postponed to January, 2023

The sixth meeting of the Institute of Mathematical Statistics Asia Pacific Rim Meeting (IMS-APRM) will provide an excellent worldwide forum for scientific communications and collaborations for researchers in Asia and the Pacific Rim, and promote collaborations between researchers in this area and other parts of the world. The meeting will be held in Melbourne, Australia and please see <http://ims-aprm2021.com/> for details.

Online Training and Seminars:

ICSA Online Training

Online training serves as a viable alternative to traditional continuing education options, e.g., two short courses offered at biostatistical conferences. Over the past year, the ASA Biopharmaceutical Section has been working on creating an online training program aimed at clinical trial statisticians and set up a pilot program, which includes half-day and

full-day courses on key topics in biopharmaceutical statistics:

- Analysis of Longitudinal and Incomplete Data
- Multiplicity Issues in Clinical Trials
- Analysis of Surrogate Endpoints in Clinical Trials
- The section has received much positive feedback from industry and academic statisticians. Clinical trial statisticians who took advantage of the online training program emphasized that this program is convenient, inexpensive and quite flexible.

A similar online training program has been set up for ICSA members. As a member of the ICSA, you will receive a 50% discount when you sign up for any course included in the program. The online training courses are based on professionally recorded videos using a format similar to that used in YouTube videos. The videos can be accessed 24/7 on a computer or even on a smartphone. The cost of online training is low compared to traditional training, and it can be further reduced by using a group-training format. Up to 25 people can view an online training course with a single registration, which lowers the cost of online training to about \$20-25 per person for full-day courses and \$10-15 per person for half-day courses.

For more information about the online training program and to sign up for the individual online courses, please visit this web page: <http://sprm.com/icsa/>.

Healthcare Innovation Technology: The Pod of Asclepius

Looking to stay up to date on developments in health care technology around the world? The American Statistical Association is sponsoring “The Pod of Asclepius”, a new podcast where data scientists, statisticians, engineers, and regulatory experts discuss the technical challenges in their healthcare domain.

We have over 20 episodes published and available on YouTube, Podbean, iTunes, Stitcher, Podchaser, Tune In Radio, and Google Play. Looking for a good place to start? Check out the following episode links:

- Risks and Opportunities of AI in Clinical Drug Development with David Madigan and Demissie Alemayehu

- Kidney Injury - Biomarkers for Prediction and Prognosis with Allison Meisner
- NHS Digital Health Initiatives with Emma Hughes
- Data Platforms to Monitor Animal Health with Shane Burns
- Bayesian Approaches in Medical Devices: Part 1, Part 2, Part 3 with Martin Ho and Greg Maislin

You can catch up on all episodes on our YouTube playlists for Season 0 and Season 1. The easiest way to catch new episodes is to subscribe via our channels:

- Youtube: <https://www.youtube.com/channel/UCkEz2tDR5K6Aj1Kw-JrV57w>
- Podbean: <https://podofasclepius.podbean.com>
- You can see our full schedule on the website: www.podofasclepius.com

For detailed information, please visit: <https://www.podofasclepius.com/philosophy-of-data-science>.



78th Annual Deming Conference on Applied Statistics

December 5-9, 2022; Philadelphia, PA

<https://demingconference.org>

The 78th Annual Deming Conference on Applied Statistics will be held from Monday, December 5 to Wednesday, December 7, 2022, followed by two parallel 2-day short courses on Thursday, December 8, and Friday, December 9, 2022, at the state-of-art Sonesta Philadelphia, Rittenhouse Square (1800 Market Street Philadelphia, PA 19103). Conference facility and hotel information can be found at <https://www.sonesta.com/us/pennsylvania/philadelphia/sonesta-philadelphia-rittenhouse-square>.

The purpose of the 3-day Deming Conference on Applied Statistics is to provide a learning experience on recent developments in statistical methodologies in biopharmaceutical applications. The conference is composed of twelve three-hour tutorials on current topics in applied biopharmaceutical statistics and FDA regulations, three one-hour distinguished keynotes on Monday, Tuesday, and Wednesday. The books, on which these sessions are based, are available for sale at an approximately 40% discount. Attendees will receive program proceedings of the presentations.

There will be poster sessions. Early registrants who submit a poster presentation will receive a \$150 discount. For poster submission, please contact “Deming Poster Chair”: Dr. Pinggao Zhang at email: pinggao.zhang@takeda.com.

There will be student scholar presentation. For student scholar application, please contact “Deming Scholar Chair”: Dr. Sofia Paul at email: sofia.x.paul@gsk.com.

The conference is sponsored by the American Statistical Association Biopharmaceutical Section and the International Chinese Statistical Association. Walter Young has chaired this conference for 53 consecutive years. The program committee includes Alfred Balch, Joseph Borden, Ivan Chan, Ding-Geng Chen, Kalyan Ghosh, Satish Laroia, Sofia Paul, Naitee Ting, Bill Wang, Wenjin Wang, Yibin Wang, Li-an Xu, Walter Young, Pinggao Zhang.

For more information about the conference, please email Dr. Din Chen at din@demingconference.org or visit <https://demingconference.org/>.