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## The World of Statistics E-Newsletter Returns in August

The next scheduled issue of this e-newsletter would have come during the 2014 Joint Statistical Meetings in Boston, an event that requires our full, undivided attention. As a result, we are canceling that scheduled issue. We will resume publication of the *News From The World of Statistics* in August and will return to its regular publishing schedule at that time.

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### FUTURE OF STATISTICAL SCIENCE HEALTHY WITH A MIX OF CHALLENGES, OPPORTUNITIES

By Ronald L. Wasserstein

Statistical science is as healthy as it ever has been, with robust growth in student enrollment, abundant new sources of data, challenging problems to solve and related opportunities to grasp over the next century, summarizes a just-released report on the future of the field.

[Statistics and Science: A Report of the London Workshop on the Future of the Statistical Sciences](http://bit.ly/londonreport)

(<http://bit.ly/londonreport>) is the product of a high-level meeting in London last November attended by 100 prominent statisticians from around the world. This invitation-only summit was the capstone event of the International Year of Statistics, a year-long celebration during 2013 that drew as participants more than 2,300 organizations from 128 countries.

The report is written in an accessible style so people who are not experts in statistics can understand its messages and the field's impact on society. It can be used as a resource by students interested in studying statistics at university, by policymakers who want to better understand the value statistics provides society and by the general public to learn more about the misunderstood field of statistical science.



Organizations participating in The World of Statistics are encouraged to make the workshop report broadly available and accessible in their country by doing the following:

- Share the link to the report with your statistical and professional colleagues
- Share the report with government agencies and private entities that provide research funding in your country
- Share the report with the national statistical organization and other appropriate agencies in your country's government
- Post a short note about the report with its link to your website
- Share the report and link with your membership or employees by including a story about it in a future issue of your organization's official publication—magazine or newsletter—or via blast email
- Send a copy of the report or its link to the media in your country along with a brief explanation
- Send a copy to the statistics departments at universities in your country
- Share the report with statistics-related organizations in your country that are not participating in The World of Statistics
- Spread word about the report via social media using your accounts and those of your employer

Among the greatest challenges and opportunities noted in the report is the rise of Big Data, which are databases that dwarf in size any databases statisticians previously encountered. It is a challenge for

several reasons: problems of scale, different kinds of data, the “look-everywhere” effect, privacy and confidentiality concerns and reinventing the “statistical” wheel by collectors of Big Data.

The advent of Big Data also has forced the statistical field to confront a question of its own identity. “The companies that work with Big Data are hiring people they call ‘data scientists.’ The exact meaning of this term is a matter of some debate; it seems like a hybrid of a computer scientist and a statistician,” notes the report.

This new job category brings both opportunity and risk to the statistics community. The value statisticians can bring to the enterprise is their ability to ask and answer such questions as these: Are the data representative? What is the nature of the uncertainty? It may be an uphill battle even to convince the owners of Big Data that their data *are* subject to uncertainty and, more importantly, bias.

On the other hand, it is imperative for statisticians not to be such purists that they miss the important scientific developments of the 21st century. “‘Data science’ will undoubtedly be somewhat different from the discipline to which statisticians are accustomed. Perhaps statisticians will have to embrace a new identity. Alternatively, they might have to accept the idea of a more fragmented discipline in which standard practices and core knowledge differ from one branch to another,” continues the report.

Section 2 of the report—titled *Current Trends and Future Challenges in Statistics: Big Data*—presents an in-depth report on Big Data, the most-discussed trend at the London workshop, and offers this advice to current and future statisticians: “Big Data should not be viewed only as a challenge or a nuisance. It is also an opportunity for statisticians to re-evaluate their assumptions and bring new ideas to the forefront.”

Other challenges and opportunities presented in the workshop report include reproducibility of scientific research, updating the randomized controlled trial, statistics of climate change, statistics in new venues, communication and visualization, education and professional rewards. These are covered in detail in Section 3.

Section 1 presents seven case studies that show how statistics is used throughout our world for the betterment of society. These include the development of randomized controlled trial methodology and methods for evaluating such trials, and the discovery through statistical methods of biomarkers—genes that confer an increased or decreased risk of certain kinds of cancer.

In its introduction, the report defines the job of statisticians using plain English as follows: “The mission of the statistician is to work with the scientists to ensure that the data will be collected using the optimal method (free from bias and confounding). Then the statistician extracts meaning from the data, so that the scientists can understand the results of their experiments and the CEOs and public servants can make well-informed decisions.”

The report concludes with a quote about the societal impact of statistical science by Nilrey Cornites, a recent statistics graduate from the Philippines: “I am still amazed by the power of statistics.... Because of

statistics, we are able to have a glimpse of the future, to understand...the significant effect of a new product or medicine, and to understand the weather. Statistics saves lives, lowers the costs, helps ensure success and improves things and processes.”

The Workshop on the Future of the Statistical Sciences and the resulting report was organized by a committee comprised of members of the American Statistical Association, Royal Statistical Society, Bernoulli Society, Institute of Mathematical Statistics, International Biometric Society, and International Statistical Institute. These same groups were the lead organizers of the International Year of Statistics. Workshop lectures are available for free at [www.statisticsviews.com](http://www.statisticsviews.com) (registration required).

*Wasserstein is a member of The World of Statistics Steering Committee and executive director of the American Statistical Association.*

## SHARE YOUR NEWS & EVENTS THROUGH THE WORLD OF STATISTICS

Tell your colleagues in the worldwide statistical community and the public about your organization’s events through The World of Statistics 2014 Activities Calendar. [Using this brief webform](#), it’s easy to submit information about your event so it is added to the activities calendar for all to see.

After your event is over, you can send us a story about it for this e-newsletter. We have developed [this easy-to-use webform](#) you can use to submit your event stories and other news about your organization’s activities to promote and advance the statistical science profession. These event stories and news items will be featured in an upcoming issue of this e-newsletter.

Send us your calendar and news items now!

## THE WORLD OF STATISTICS 2014 ACTIVITIES CALENDAR FOR JULY & AUGUST

Following are The World of Statistics participating organization-sponsored events and activities around the world for the remainder of this month and August. To see the complete list of activities for 2014, [click here](#).

- **July 13-18, 2014** — [ICOTS 9: Sustainability in Statistics Education](#), International Association for Statistical Education, Flagstaff, Arizona, USA
- **July 24, 2014** — [Nonparametric Statistical Inference for Receiver Operating Characteristic Curves in Measurement Error Models](#), State University of New York at Buffalo Department of Biostatistics, Buffalo, New York, USA
- **July 28-August 1, 2014** — [37th Conference on Stochastic Processes and Their Applications](#) (SPA) 2014, Bernoulli Society, Buenos Aires, Argentina
- **August 2-7, 2014** — [2014 Joint Statistical Meetings](#); American Statistical Association, International Biometric Society (ENAR and WNAR), Institute of Mathematical Statistics, International, Chinese Statistical Association, International Indian Statistical Association, International Society for Bayesian Analysis, Korean International Statistical Society, Royal Statistical Society, and Statistical Society of Canada; Boston, Massachusetts, USA
- **August 13-15, 2014** — [III International Conference of Probability and Statistics \(III JIPE\)](#), Pontifical Catholic University of Perú, Lima, Perú

- **August 19-22, 2014** — [COMPSTAT 2014](#), International Association for Statistical Computing, Geneva, Switzerland
- **August 25-30, 2014** — [Istanbul Quantitative Lectures \(ISTQL\) 2014 Summer School](#), Istanbul University, Istanbul, Turkey

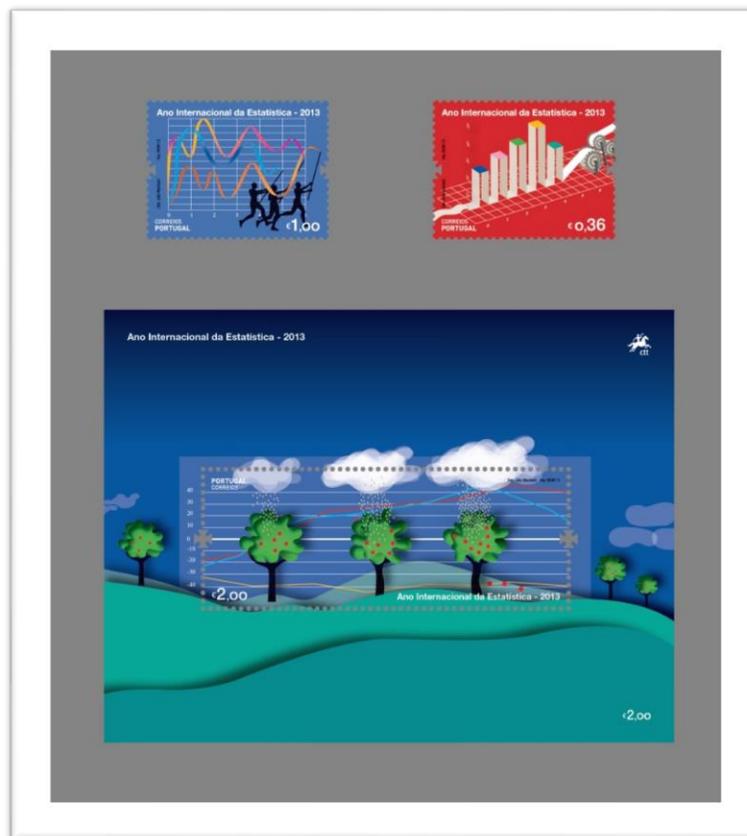
[Click here to submit your organization’s activities to The World of Statistics 2014 Activities Calendar.](#)

## PARTICIPATING ORGANIZATION NEWS & EVENTS

Following is the latest news and information from statistical organizations participating in The World of Statistics:

**Portugal—** Vicenza, Italy is the site of the annual Asiago Philatelic Fine Art Awards. It is one of the oldest and most important philatelic design awards in the world, held under the patronage of the president of the Italian Republic. Sometimes people refer to these awards as the “Philatelic Oscars.” This year, the ceremony was held July 6 and gave recognition to the artistic achievement of stamps issued in 2013.

Awards are presented in three categories: Best stamp promoting ecology, best tourism stamp and best stamp in the world. In addition, there is a special prize presented by the Olympic Academy of Vicenza for the stamp best promoting cultural awareness.



*CTT Correios de Portugal stamps commemorating the International Year of Statistics win a major prize.*

At the award ceremony, International Year of Statistics-themed stamps issued in Portugal were presented the Asiago Prize in the tourism category. The author of the stamp design is Professor João Machado, a well-known Portuguese designer.

The International Year of Statistics commemorative stamps represent three axes—nature, man and development and industry—through a visual language based on pure statistical elements. The stamps are still being offered by CTT Correios de Portugal—the Portuguese postal operator. Orders for the stamps can be made by emailing a request to [filatelia@ctt.pt](mailto:filatelia@ctt.pt) or ordering online at [www.ctt.pt](http://www.ctt.pt).

**United States**—The American Statistical Association (ASA) has released three white papers detailing how statisticians and statistical science are vital to advancing three U.S. government scientific research priorities: the Big Data Research and Development Initiative, BRAIN Initiative and climate change.

“The ASA white papers detail how statisticians are vital partners in advancing science with their expertise in experimental design, inference and uncertainty quantification,” said ASA Science Policy Director Steve Pierson. “Each also clearly articulates the essential expertise statisticians can provide to help tackle our nation’s critical research priorities.”

Three groups comprised of a dozen ASA members with expertise in the given scientific area authored the authoritative reports. The common themes of the white papers are three-fold:

1. Statistics/statisticians can help make important advances on federal research priorities
2. The most productive approach will involve multidisciplinary teams of statisticians, domain scientists and others (e.g., computer scientists)
3. There is a need to attract, train and retain the next generation of statisticians so as to contribute to all interdisciplinary research challenges

Following are summaries of each white paper:

- [Discovery with Data: Leveraging Statistics with Computer Science to Transform Science and Society](#) – This paper discusses the statistical components of scientific challenges facing many broad areas being transformed by Big Data—including health care, social sciences, civic infrastructure and the physical sciences—and describes how statistical advances made in collaboration with other scientists can address these challenges. It also emphasizes the need to attract, train and retain the next generation of statisticians necessary to address the research challenges outlined in it. Cynthia Rudin, associate professor of statistics at the Massachusetts Institute of Technology Computer Science and Artificial Intelligence Laboratory and Sloan School of Management, chaired the Big Data R&D Initiative Working Group.
- [Statistical Research and Training Under the BRAIN Initiative](#) – Advances in brain research have begun to produce exciting breakthroughs. To realize their potential, however, new analysis and computational techniques are needed to optimize data acquisition; manage acquired data on the fly; screen and segment the data; correct for artifacts; and align and register data across multiple time points, multiple experiments, multiple subjects or different laboratories. In

addition, as the data-generation process becomes more complex and the data sets get larger and more varied, it is crucial that reliability and scientific relevance of results be assessed against the backdrop of natural variation and measurement noise. This is the essential role of statistical analysis. The chair of the BRAIN Initiative Work Group was Rob Kass, professor in the department of statistics, department of machine learning and Center for the Neural Basis of Cognition at Carnegie Mellon University.

- [Statistical Science: Contributions to the Administration's Research Priority on Climate Change](#) – This white paper makes the case for the NSF to establish an interdisciplinary research program around climate, where statisticians have the opportunity to collaborate with researchers from other disciplines to advance the understanding of the climate system (e.g., quantification of uncertainties, the development of powerful tests of scientific hypotheses). Although NSF supports basic and applied statistical research, these efforts often do not involve scientists and statisticians in partnerships or teams to address problems in climate science. This program also would address the critical need for training a new generation of interdisciplinary researchers who can tackle challenging scientific problems that require complex data analysis by developing and using the necessary sophisticated statistical methods. Bruno Sanso, chair of the department of applied mathematics and statistics at the University of California, Santa Cruz, was chair of the Advisory Committee on Climate Change Policy.

In addition, the ASA is exploring the development of white papers on other federal research priorities, including STEM education, innovation in biology and neuroscience and research and development for informed policymaking and management, says Pierson.

See the following July *Amstat News* article for an overview of these white papers: [Statistical Scientists Advance Federal Research Initiatives](#).

**India**—The Eighth Statistics Day was celebrated June 29 at the C.R. Rao Advanced Institute of Mathematics, Statistics and Computer Science (CRRAO AIMSCS) jointly with University of Hyderabad. The date of the celebration coincided with the 121st birthday of Professor Prasanta Chandra Mahalanobis.

In recognition of Mahalanobis' notable contributions in the fields of economic planning and statistical development, the government of India has designated June 29 every year as Statistics Day—an event that is celebrated at the national level. The objective of this day is to create public awareness among the public, especially younger people for drawing inspirations from Mahalanobis about the role of statistics in socio-economic planning and policy formulation.

Mahalanobis was the founder of the Indian Statistical Institute (ISI) about eight decades ago. It played a major role in the development of statistics as a separate discipline of study and research and in helping the government in establishing a well-designed national statistical system. He is truly the father of statistics who put India not far from the centre of the statistical map of the world.

Attendees at the Eighth Statistics Day festivities included Dr. C. Rangarajan, former chairman of Economic Advisory Council for the Prime Minister of India and chairman of C.R. Rao AIMSCS, was the chief guest. Justice M. Jagannadha Rao, former Supreme Court judge and former chairman of the Law Commission, was the distinguished guest of honour. Professor P V Arunachalam, former vice chancellor of Dravidian University; Professor E. Haribabu, pro vice chancellor of the University of Hyderabad; and Dr. U. Yugandhar, member of the C.R. Rao AIMSCS Governing Council, were guests of honour.



*Distinguished guests at India's Eighth Statistics Day honor Professor Prasanta Chandra Mahalanobis during a lamp-lighting ceremony.*

After the welcome message by Professor Allam Appa Rao, director of the institute, Professor T. J. Rao, read a message from Professor C.R. Rao and briefly talked about the importance of Statistics Day and the institute's role in the Sixth Statistics Olympiad this year. Approximately, 1,300 students participated in the Olympiad Test at Level I (Classes IX and X) and around 200 at Level II (Classes XI and XII) from selected centres of the states of Andhra Pradesh and Telangana.

One Special Award called "C.R.Rao and C. Bhargavi Rao Prize" and a merit certificate was awarded to the winners in each level shared by two students each; 10 other students were awarded merit certificates. The institute also announced the Olympiad Test had gone international with Sri Lanka participating in the test on the same date and the winner of Level II was from Sri Lanka.

**Europe**—The European Central Bank will hold its Seventh Statistics Conference October 15 in Frankfurt am Main, Germany. Themed "Towards the Banking Union: Opportunities and Challenges for Statistics,"

the event will bring together users and compilers of statistics from central banks, supervisory authorities, national statistical institutes, international institutions, academia, the media and the financial industry. The focus will be on issues related to the statistical preparation for the [Single Supervisory Mechanism](#). The series of biennial ECB conferences on statistics provides an important forum for the exchange of views on requirements, opportunities and challenges for statistics for central bank policymaking. [Click here for more information about this ECB Statistics Division-sponsored event.](#)

**Italy**—Next year, the Italian Statistical Society will host an event titled “Statistics and Demography: The Legacy of Corrado Gini” in collaboration with the Department of Statistical Sciences of the University of Padua. The event, which will be held September 9-11, 2015 in Treviso, will celebrate the life and accomplishments of Gini.

[Corrado Gini](#) entered the Faculty of Law at the University of Bologna, where in addition to law he studied mathematics, economics, and biology. His subsequent scientific work ran in two directions, toward the social sciences and toward statistics. His interests ranged well beyond the formal aspects of statistics to the laws that govern biological and social phenomena.

In 1910, he acceded to the chair of statistics at the University of Cagliari and then at Padua in 1913. He founded the statistical journal *Metron* in 1920. He directed the publication until his death and never accepted articles that did not have practical applications.

He became a professor at the University of Rome in 1925. There, he founded a lecture course on sociology, which he maintained until his retirement. He also set up the School of Statistics, in 1928, and, in 1936, the Faculty of Statistical, Demographic and Actuarial Sciences. In 1929, Gini founded the Italian Committee for the Study of Population Problems (Comitato italiano per lo studio dei problemi della popolazione), which two years later organised the first Population Congress in Rome. In the 1926 he was appointed president of the Central Institute of Statistics in Rome. This he organised as a single center for Italian statistical services. He resigned in 1932 in protest at interference of his work by the fascist state. He was elected SIS president from 1941 to 1965.

[More information about the event is available by clicking here](#) or emailing Barbara Cafarelli at [sis2015info@gmail.com](mailto:sis2015info@gmail.com).

**United States**—Kudos to Oregon State University and College of Science Dean Sastry Pantula for promoting the [Future of the Statistical Sciences Workshop report on the college’s website](#). Pantula is a member of [The World of Statistics’ Steering Committee](#) and was on the same panel for the International Year of Statistics and a driving force behind the successful yearlong celebration.

**United States**—The eighth episode of Stats+Stories is now available. The episode is titled “How do I know this medicine works?” and features [Marie Davidian](#), William Neal Reynolds professor of statistics at [North Carolina State University](#) and past president of the [American Statistical Association](#). She joined Stats+Stories to discuss studies that underlie drug development. Davidian has broad interest and expertise involving the development and application of statistical methods to challenges in health science research.

Stats+Stories explains the statistics behind the stories in the news. The podcast program was developed at Miami University of Ohio by Richard Campbell (a.k.a., the stories guy), director of the Journalism program; and John Bailer (the numbers guy), chair of the department of statistics. The program is moderated by Bob Long, an experienced National Public Radio broadcaster. During each episode, quantitative ideas encountered in our daily lives and journalism are explored. Each program features a guest who shares a story with a strong statistical flavor. The first program was released in May 2013.

To listen to the show featuring Davidian, visit [www.statsandstories.net](http://www.statsandstories.net) or iTunes. [Click here to access previous programs](#) featuring prominent guests such as Karen Kafadar (talking about crime statistics) and Tommy Wright (focusing on the U.S. Census Department).

## **NATIONAL STATISTICAL ORGANIZATION: NEWS & EVENTS**

Following is the latest news and information from national statistical organizations participating in The World of Statistics:

**Qatar**—The Ministry of Development Planning and Statistics (MDP&S) recently released the “Qatar Economic Outlook (QEO) 2014–2015.” QEO forecasts robust growth of real gross domestic product (GDP) of 6.3% in 2014 and 7.8% in 2015, driven by gathering expansion of the non-hydrocarbon economy. The impulse to growth from hydrocarbon production in past years is receding and growth is increasingly dependent on solid performance in other sectors. Dr. Saleh Al Nabit, minister of MDP&S, said, “The last few years have shown a robust trend of continuous growth in non-hydrocarbon sectors. Last year, for example, services and construction were the main contributors to economic growth, propelled by investments in infrastructure. And in the coming years, growth is expected to be more broadly based still.” Inflation inched up to 3.1% in 2013 from nearly 2% in 2012. It is forecast to be largely unchanged in 2014 at 3.0%, and to increase modestly in 2015 to 3.4%. Domestic inflationary pressures are expected to pick up over the rest of 2014 and in 2015 as domestic demand strengthens, though the moderate inflation in the first half of 2014 will restrain the year’s average, and a benign global inflation outlook will help to offset domestic sources of inflationary pressures in the near term. The fiscal surplus in FY2013-14 was higher than the previous year’s. The balance is on track to remain in surplus in FY2014-15, even if narrowing over the forecast period, owing both to expenditure growth (capital and recurrent) as the public investment programme gathers pace, and to an expected decline in hydrocarbon revenue.

## **JOIN THE WORLD OF STATISTICS**

If your organization or an organization you know of isn’t yet part of The World of Statistics, encourage them to join. Joining is easy—just ask a representative of the group go to [www.worldofstatistics.org](http://www.worldofstatistics.org) and click on the “Join” icon on the top right-hand side of the homepage to become an official participating organization in The World of Statistics. Participation is valuable and is absolutely free!

## **THE WORLD OF STATISTICS NEEDS YOUR HELP**

Now that the [new website for The World of Statistics](#) is up and running, we need your help.

You can help move The World of Statistics website up in the list of Internet search results by linking to the new website address—[www.worldofstatistics.org](http://www.worldofstatistics.org)—from your organization’s website and replacing the old Statistics2013 logo with the new logo for The World of Statistics and linking it to the new website. [You can download the new logo here.](#)

[See how the United States National Center for Education Statistics is displaying The World of Statistics logo on its website \(go to bottom of the homepage\).](#) Kudos to Andrew White, NCES Senior Research Statistician Statistical Standards and Data Confidentiality, for sharing the link with us and, more importantly, for posting the logo.

Some other things your organization can do to help the cause include:

1. Update existing links to [www.statistics2013.org](http://www.statistics2013.org) on your website so that these point to [www.worldofstatistics.org](http://www.worldofstatistics.org)
2. Change all references to Statistics2013 on your website to The World of Statistics and link to the new website ([www.worldofstatistics.org](http://www.worldofstatistics.org))
3. Change your Facebook page information, links and logos so that these reference The World of Statistics. Also, share information about and publicize The World of Statistics on your organization’s social media accounts, including Facebook and Twitter
4. Post a version of The World of Statistics logo in your language on your organization’s website. [We currently have nine language versions available for download.](#) To request a language-customized logo, email the following information in a PDF document to Jeff Myers at [jeffrey@amstat.org](mailto:jeffrey@amstat.org):
  - a. The interpretation in your language of: “The World of Statistics”
  - b. The interpretation in your language of: “Participating Organization”
5. If you have a linked Statistics2013 banner on your organization’s website, please remove it and replace it with a new banner for The World of Statistics and link the new banner to [www.worldofstatistics.org](http://www.worldofstatistics.org). [You can download these new banners here.](#)
6. The World of Statistics Twitter account is @astatworld. Start following us today. Be sure to retweet our tweets and also mention The World of Statistics—hashtag #TWOS—in your tweets.
7. If your website has content about Statistics2013, please delete it and replace it with [copy about The World of Statistics](#).
8. As you did with Statistics2013, include mentions of The World of Statistics in all your organization’s online communications.

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