LEADING IN A DATA SCIENCE WORLD

Lisa LaVange, PhD, ASA President

University of North Carolina, Dept. of Biostatistics

Fall Technical Conference

West Palm Beach, FL

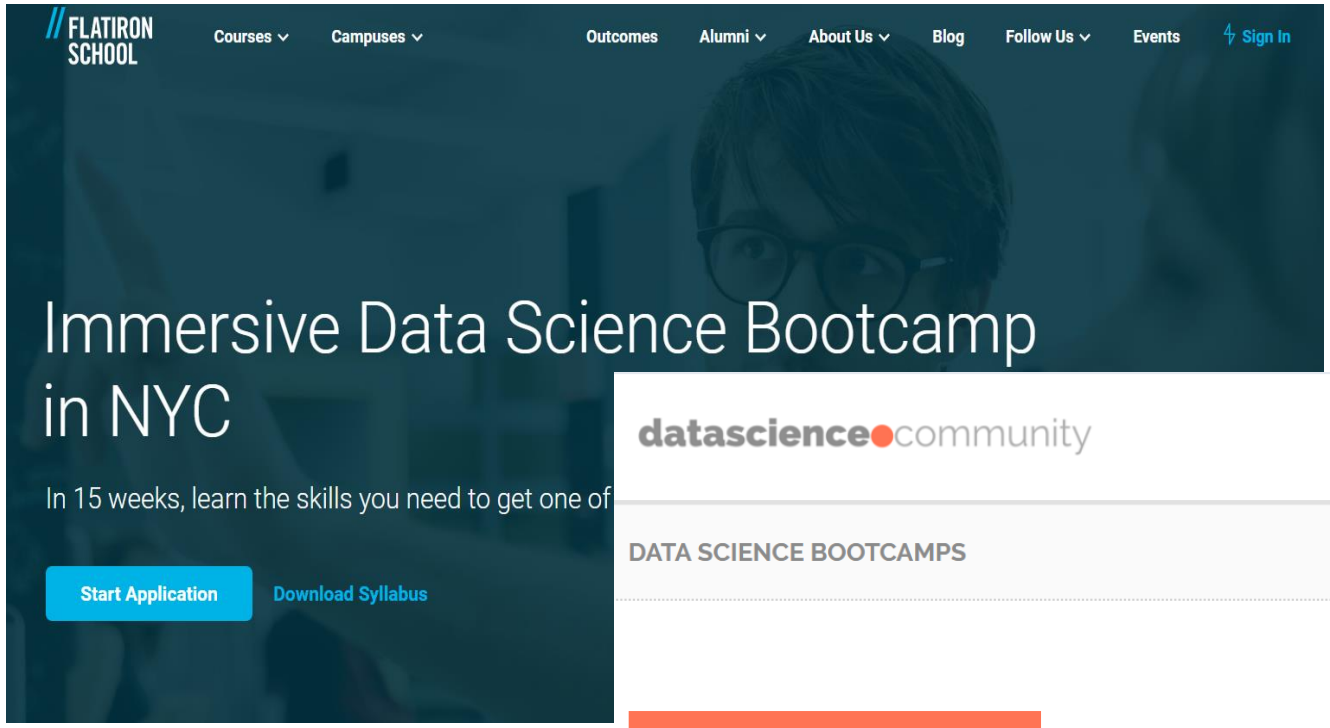
October 4-5, 2019

Outline

- Data Science and Statistics – what's new?
- Some reflections on data science and FDA
- ASA Initiatives
- ASA Leadership Institute

DATA SCIENCE AND STATISTICS

What's New?



datasciencecommunity

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DATA SCIENCE BOOTCAMPS

Home / Data Science Bootcamps

Advertise Your Bootcamp Here!
Reach potential students looking to advance their careers.
Contact Us for details.

This list is based upon the **Awesome Data Science Bootcamps** list on Github. **Would you like your bootcamp to be listed?**

Search:

Bootcamp(Program)	Country	State	Online	Price	Comments
Data Science Dojo (Data Science and Data Engineering Bootcamp)	US and others		F	2999	5-day immersive data science bootcamp, no pre-requisites
Big Data Bootcamp (Big Data from AmpLab)	US	CA	T	600	Training for big data tools, specifically products from the UC Berkeley AMPLab
Bit Bootcamp (Data Science)	US	NY	F	0	6 week data science program and 4 week big data program
DS12 (Data Science+Engineering)	US	CA	F	0	12 candidates for 12 weeks. Scala/Spark focused with expert instructors. Embedded in DataScience Inc - stipend provided

29 Bootcamp entries

http://datascience.community/bootcamps

Top-ranked, most comprehensive curriculum

NYC Data Science Academy's 12-week Immersive Bootcamp prepares you with everything you need to land a job as data scientist. Our Bootcamp students receive over **420 hours** of education and hands-on practice. You'll learn data science with **R, Python, Machine Learning, Hadoop & Spark, Github, and SQL** as well as the most popular and useful R and Python packages like XgBoost, dplyr, ggplot2, Pandas, Scikit-learn, and more.

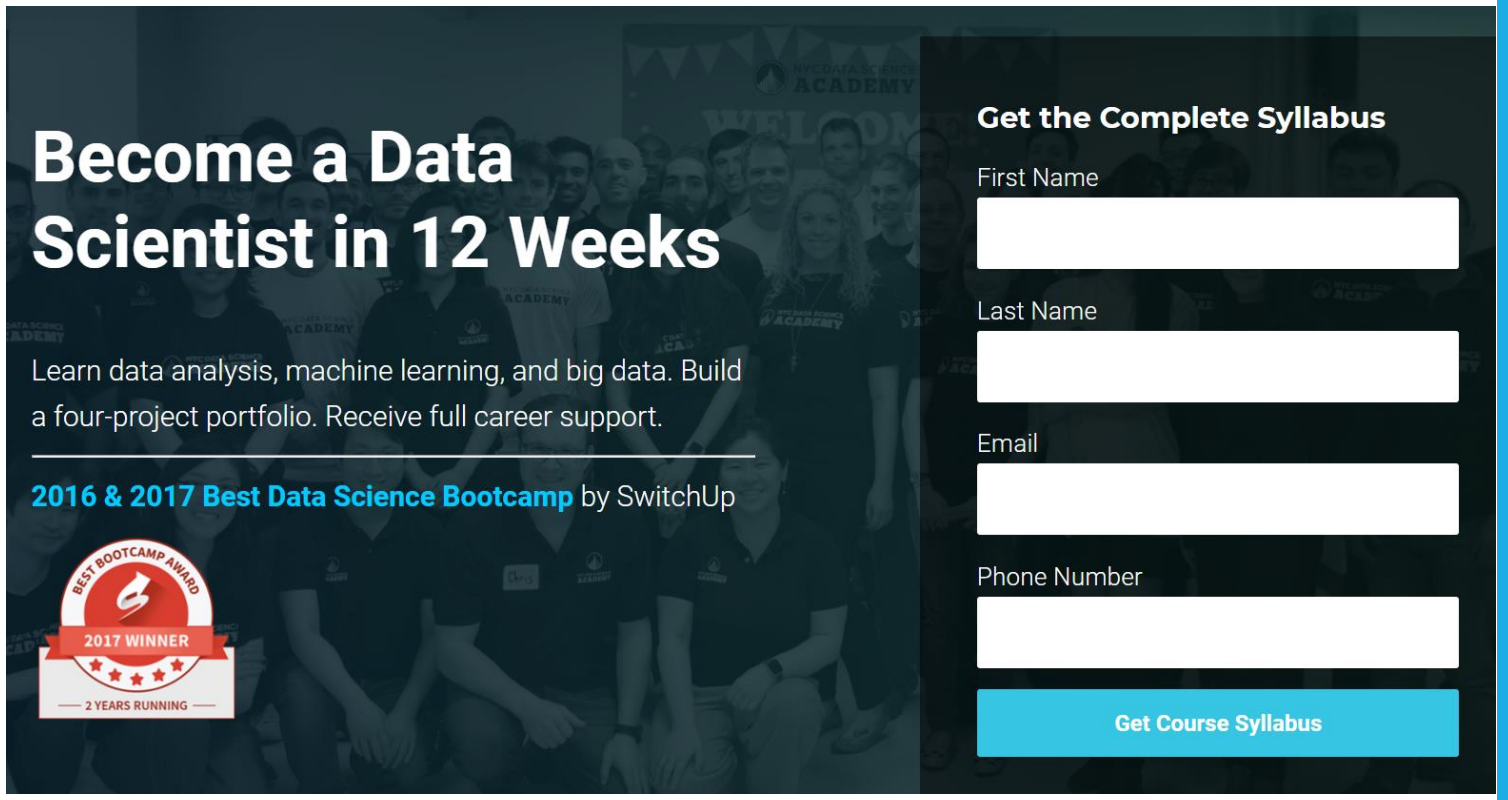
Throughout the program, you'll build at least **4 projects** using techniques from visual and statistical analyses to supervised and unsupervised machine learning algorithms and big data technologies. Nothing proves your skills better than having solid projects presented in your portofolio.

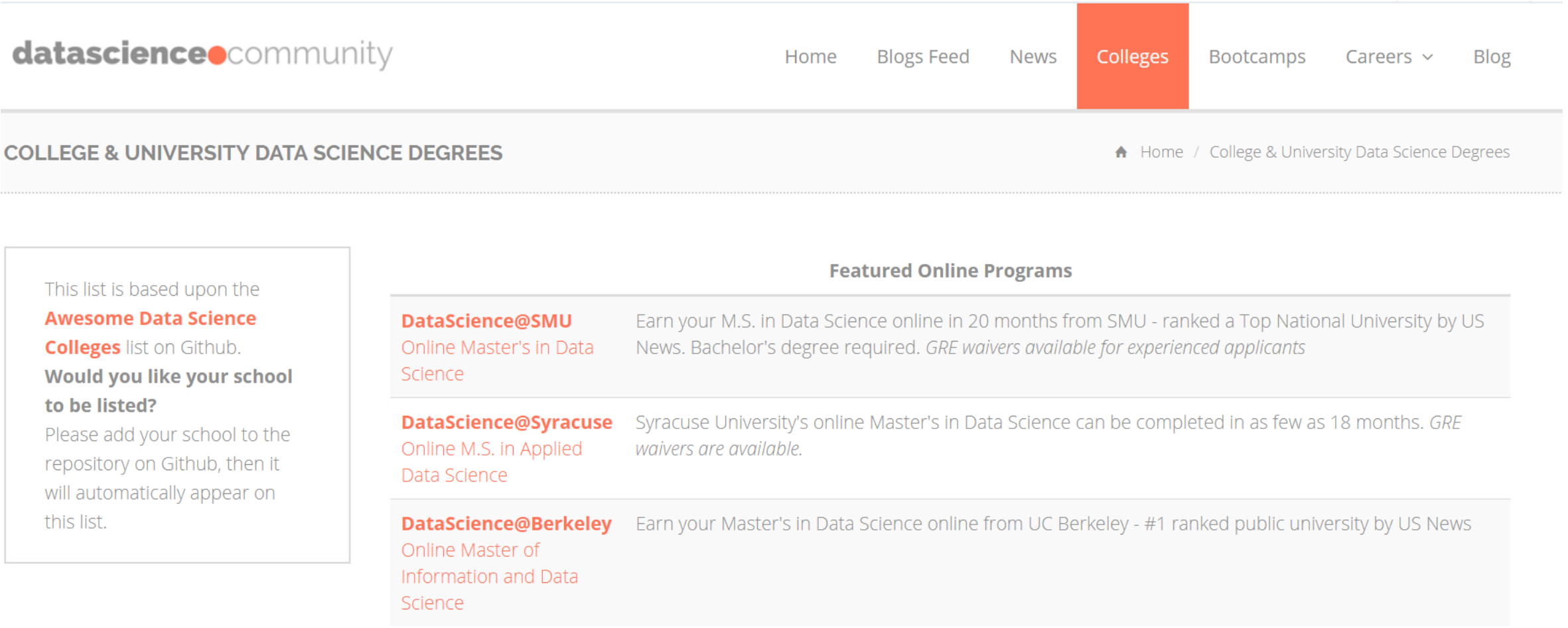
NEXT IMMERSIVE START DATE

January 7th, 2019

Apply Now

NYC DATA SCIENCE ACADEMY





582 entries in college/university degree programs

http://datascience.community/colleges

LATEST TWEETS

7 Sep

We're back! Check out our newest blog post:

The Risk #AritificalIntelligence Poses to Future #Cybersecurity: https://t.co/dnVDtuQQHg

9 Aug

How #datascience could improve the healthcare industry-

You are here: Home / Complete Directory of Data Science Graduate Degrees / Top 23 Schools with Data Science Master's Programs

Top 23 Schools with Data Science Master's Programs

Looking to freshen your résumé and improve your earning potential? You're in exactly the right place at exactly the right time. According to Glassdoor, there are over 15,000 jobs in the analytics and data science fields as of January 2018. In response, universities have been looking to improve their existing degree data and analytical programs and to create entirely new degrees offerings, both online and on-campus. We've listed 23 of these programs below.

Choose the Best Masters in Data Science Program For You

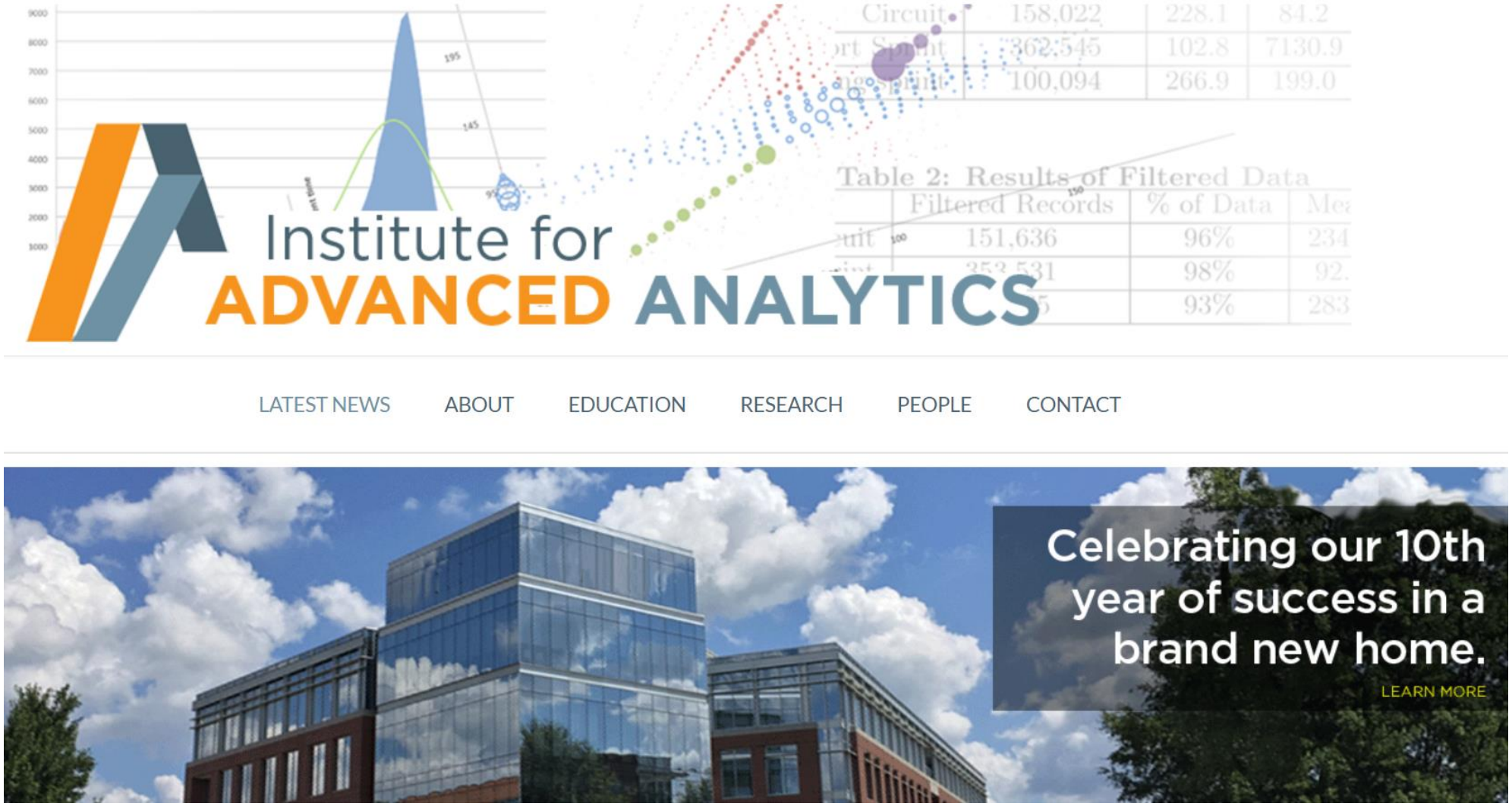
CAREER PROFILES

Business Analyst
Data Analyst
Data Architect
Data Engineer
Data Scientist
Marketing Analyst
Quantitative Analyst
Statistician

SCHOOLS BY STATE

Alabama
Arizona

https://www.mastersindatascience.org/schools/23-great-schools-with-masters-programs-in-data-science/



https://analytics.ncsu.edu/

1st Master's program in Advanced Analytics

UNC MPH program Launches in 2019

UNC | GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH

DEGREES STUDENTS DEPARTMENTS DISCOVER GILLINGS GIVE FULL MENU

Accessibility

CONTACT US

Student Services Manager: Veronica Stallings, MS

Concentration Leader

Primary Contact: Lisa LaVange, PhD

- Master of Public Health
- Gillings MPH Core
- Applied Epidemiology Concentration
- Environmental Health Solutions Concentration
- Global Health Concentration
- Health Behavior Concentration
- Health Equity, Social Justice and Human Rights Concentration
- Health Policy Concentration

Public Health Data Science Concentration

Scientific discoveries made by the Gillings School's Dr. Michael Kosorok, left, were put into practice by pediatric pulmonologist Dr. George Retsch-Bogart. The result was better hospital care and better health for children with cystic fibrosis.

About

Accurate interpretation and use of data is crucial to understanding health needs and devising and implementing comprehensive, evidence-based solutions.

The Public Health Data Science concentration—one of the first applied data science programs situated within a school of public health—will give you the skills and knowledge to employ cutting-edge data science tools and, in turn, respond to pressing public health issues and advance effective solutions.

- 2nd Data Science Leadership Summit
- For academic leaders trying to integrate data science research and education
- ASA, ICM, IEEE, SIAM, IMS represented
- 20+ Data Science Institutes in major public and private universities today

DATA SCIENCE AND FDA

"…Give priority to provisions that present the greatest opportunity for FDA to foster innovation and integrate advances in biological sciences, engineering, information technology, and **data science**, to most directly improve the Agency's product review tools and processes."

21st Century Cures Act

SHARE | TWEET | LINKEDIN | PIN IT | EMAIL | PRINT

The 21st Century Cures Act (Cures Act), signed into law on December 13, 2016, is designed to help accelerate medical product development and bring new innovations and advances to patients who need them faster and more efficiently.

"… "Expert FDA staff with expertise in statistics, **data science**, meta-analysis, clinical outcomes research, and other areas will develop the framework and methodologies for evaluating the use of real world evidence

Precision Medicine

- Personalized medicine is getting the right product to the right patient (and in case of a drug or biologic) at the right dose
- Key challenge is to identify targeted subgroups at the right stage
- FDA statisticians involved in a number of areas:
  - Diagnostic device evaluation (CDRH)
  - Enrichment study designs (CBER and CDER)
  - Master protocols/platform trials (CBER, CDER, CDRH)
  - Biomarker validation and qualification (CDER)

Master Protocols

- Multiple diseases, multiple patient subgroups (biomarker-defined), and/or multiple therapies studied under one, over-arching protocol
- Also known as:
  - Umbrella or platform trials: one disease, multiple drugs
    - Example: NCI MATCH
  - Basket trials: one drug, multiple disease cohorts
    - Example: B225 trial of imatinib

Master Protocols

- Exploratory: Identify best treatment for biomarker-defined patient subgroup
  - Example: I-SPY II
- Confirmatory: Evaluate different therapies relative to control for a single disease in parallel
  - Example: Lung MAP
- Capitalize on similarities among trials and shared infrastructure to realize efficiencies
- Needed:
  - Regulatory buy-in
  - Sponsors with drugs to test

Master Protocols

Two avenues for innovation:

1. Establish a trial network with infrastructure in place to streamline trial logistics, improve data quality, and facilitate data sharing and new data collection
2. Develop a common protocol for the network that incorporates innovative statistical approaches to study design and data analysis

Infrastructure Advantages

- Established systems in place
  - Central randomization (e.g., via web portal)
  - Central electronic data capture system
  - In-network clinic personnel trained and experienced on existing systems
- Centralized governance structure
  - Use of central IRBs, a standing DMC, and/or other bodies
- Central labs, reading centers, etc., with QA oversight
- Common elements of trial protocols and common CRFs

→Gain efficiencies in study-start-up and conduct, trial monitoring, and data close-out

Innovative Design Possibilities

- Imbalanced randomization (e.g., 2:1, 3:1, or higher)
- Use of external or historical control data
  - In single-arm studies, or
  - In conjunction with concurrent controls (with 2:1 or higher) to increase power; potential adaptation
- Sharing of control groups across protocols – *within a specific pathway or marker subgroup*
- Model-based analysis methods (e.g., hierarchical Bayes) for pooled analysis of multiple disease or tumor types, markers, body sites, etc.

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

THE CHANGING FACE OF CLINICAL TRIALS

Jeffrey M. Drazen, M.D., David P. Harrington, Ph.D., John J.V. McMurray, M.D., James H. Ware, Ph.D., and Janet Woodcock, M.D., *Editors*

Master Protocols to Study Multiple Therapies, Multiple Diseases, or Both

Janet Woodcock, M.D., and Lisa M. LaVange, Ph.D.

HIGH-QUALITY EVIDENCE IS WHAT WE USE TO GUIDE MEDICAL PRACTICE. The standard approach to generating this evidence — a series of clinical trials, each investigating one or two interventions in a single disease — has become ever more expensive and challenging to execute. As a result, important clinical questions go unanswered. The conduct of "precision medicine" trials to evaluate targeted therapies creates challenges in recruiting patients with rare genetic subtypes of a disease. There is also increasing interest in performing mechanism-based trials in which eligibility is based on criteria other than traditional disease definitions. The common denominator is a need to answer more questions more efficiently and in less time.

A methodologic innovation responsive to this need involves coordinated efforts to evaluate more than one or two treatments in more than one patient type or disease within the same overall trial structure.[1-4] Such efforts are referred to as master protocols, defined as one overarching protocol designed to answer multiple questions. Master protocols may involve one or more interventions in multiple diseases or a single disease, as defined by current disease classification, with multiple interventions,

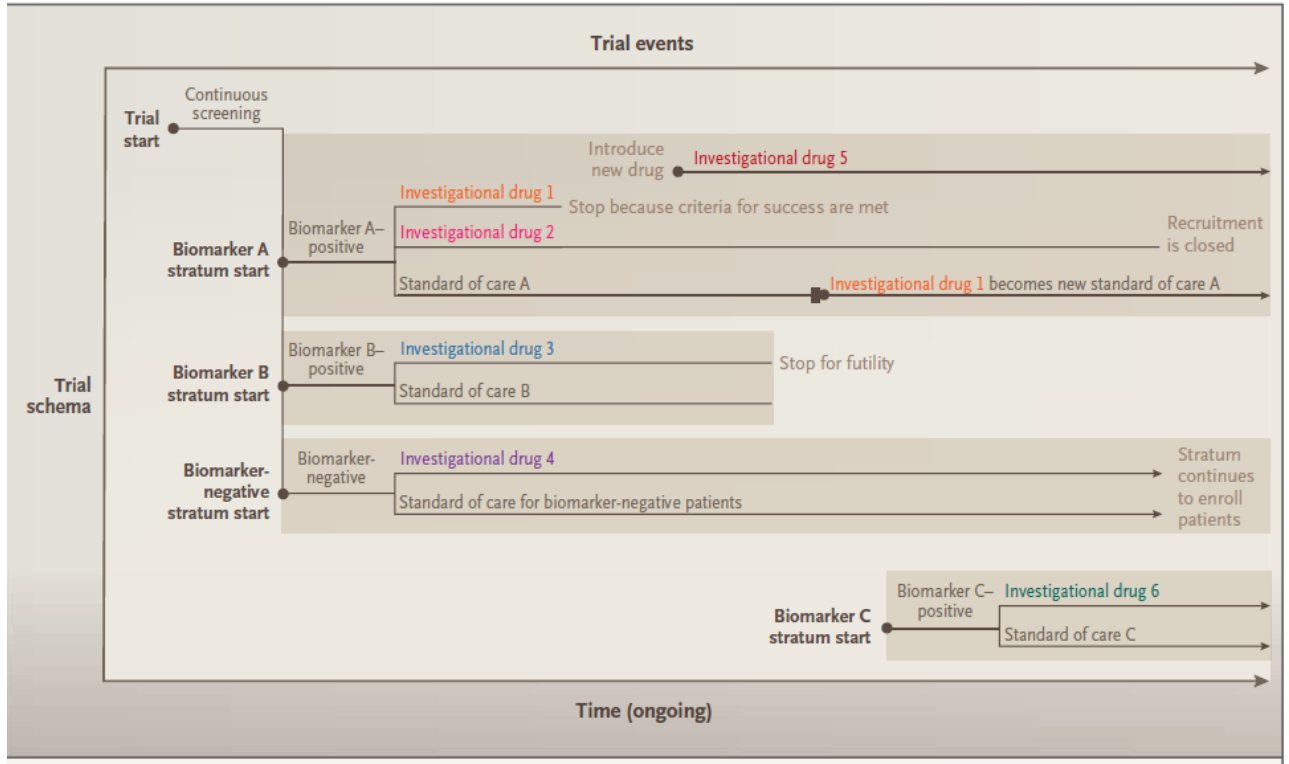


Figure 2. Potential Design of a Platform Trial Involving a Single Disease.

2 FDA Guidance Documents Issued Sep. 29, 2018

Adaptive Designs for Clinical Trials of Drugs and Biologics

Guidance for Industry

DRAFT GUIDANCE

This guidance document is being distributed for comment purposes only.

Comments and suggestions regarding this draft document should be submitted within 60 days of publication in the *Federal Register* of the notice announcing the availability of the draft guidance. Submit electronic comments to https://www.regulations.gov. Submit written comments to the Dockets Management Staff (HFA-305), Food and Drug Administration, 5630 Fishers Lane, Rm. 1061, Rockville, MD 20852. All comments should be identified with the docket number listed in the notice of availability that publishes in the *Federal Register*.

For questions regarding this draft document, contact (CDER) Scott N. Goldie at 301-796-2055, or (CBER) Office of Communication, Outreach and Development, 800-835-4709 or 240-402-8010.

U.S. Department of Health and Human Services
Food and Drug Administration
Center for Drug Evaluation and Research (CDER)
Center for Biologics Evaluation and Research (CBER)

September 2018
Clinical/Medical

Master Protocols: Efficient Clinical Trial Design Strategies to Expedite Development of Oncology Drugs and Biologics

Guidance for Industry

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For questions regarding this draft document contact (CDER) Lee Pai-Scherf at 301-796-3400 or (CBER) the Office of Communication, Outreach, and Development at 800-835-4709 or 240-402-8010.

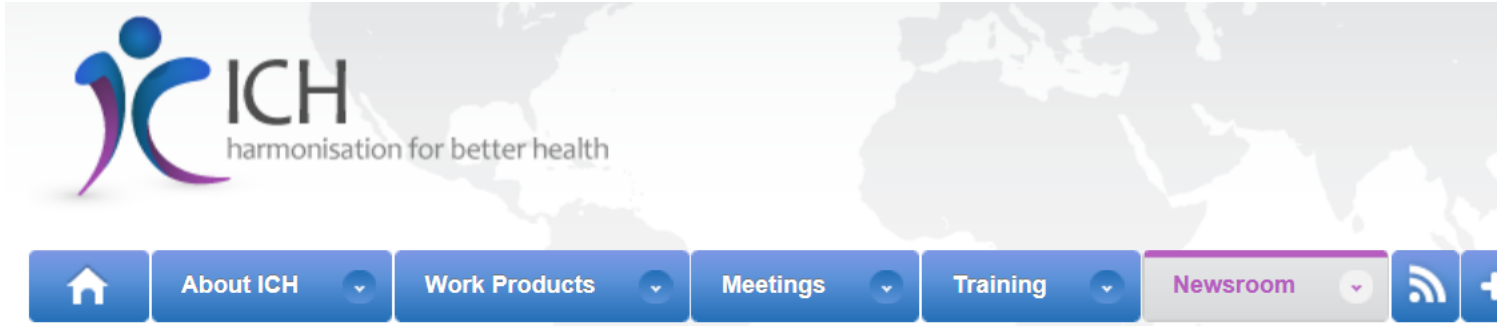
U.S. Department of Health and Human Services
Food and Drug Administration
Center for Drug Evaluation and Research (CDER)
Center for Biologics Evaluation and Research (CBER)
Oncology Center of Excellence (OCE)

September 2018
Procedural

Master Protocols – NIH application

- PrecISE – Precision Medicine in Severe, Exacerbation Prone Asthma network
- Adaptive platform trial conducted under a master protocol
- 6 novel interventions identified for study
  - Early futility testing to drop interventions
  - Add other interventions, as they become available
- Randomization probabilities based on biomarker-defined subgroups of patients targeted by each intervention
- Precision medicine interim analysis to refine definition of target subgroup
  - Refine cut-point delineating biomarker + and – patients
  - Refine the biomarkers themselves
- Final precision medicine analysis to identify best course of treatment among overlapping subgroups using machine learning methods

- FDA Reflection paper on E6, E8
- Proposal to
  - Revise E8 (R1)
  - Renovate E6
- Office of Biostatistics:
  - Co-authored reflection paper
  - Leading E8 revision



ICH Reflection on "GCP Renovation": Modernization of ICH E8 and Subsequent Renovation of ICH E6

12 January 2017

ICH is inviting public review and comment on a reflection paper on Good Clinical Practice (GCP) "Renovation", which contains the ICH proposal for further modernization of the ICH Guidelines related to clinical trial design, planning, management, and conduct. The scope of the proposed renovation includes the current E8 General Considerations for Clinical Trials and further revision to the E6 Guideline for Good Clinical Practice, which is already undergoing modernization with the recent production of ICH E6(R2).

The reflection paper is available for download via the following link:

- Reflection paper on GCP Renovation

The goal of the potential renovation is to provide updated guidance that is both appropriate and flexible enough to address the increasing diversity of study types and data sources that are being employed to support regulatory and other health policy decisions, as appropriate. The underlying principles of human subject protection and data quality would remain. ICH's decision to invite stakeholder comment on the proposed renovations at this early stage, ahead of guideline development efforts, recognises the considerable stake and relevant expertise in the research community beyond ICH.

The seeking of stakeholder comment on the current reflection paper is seen as a first step in an enhancement of the ICH process with respect to public consultation for the revision of ICH E8 and E6. The GCP Renovation reflection paper outlines additional steps that are also being considered to enhance stakeholder engagement.

ICH E8 General Considerations for Clinical Trials

- 1999 guideline describes:
  - Phases of drug development
  - Features of trial design
  - Importance of protecting safety of participants
- Expert working group formed for revision; two meetings held to date
  - Target date of 1st quarter 2019 for draft guideline available for public comment
  - Statistician is rapporteur; EWG includes variety of disciplines
- Revised document:
  - Introduces quality by design approach; critical to quality factors managed proportionate to risk
  - Expands types of trial designs beyond RCTs
  - Expands data sources to include real-world data*

*Jarow, LaVange, and Woodcock, *JAMA*, 2017

Subgroup Analysis

Types of subgroups

1. *Defined for reporting purposes* – e.g., demographic subgroups (age, sex, race/ethnicity). Differences are not expected but may be observed

2. *Defined by geographic region* – differences are expected due to patient characteristics or traits, medical practice, etc., and regulatory decisions are often affected

3. *Defined by biomarkers* – usually with the expectation that one or more 'marker (+) subgroups will experience more benefit or less harm than others

Subgroup Analysis

Problem statement – differential effects:

- Trials intended to demonstrate safety and efficacy for drugs, biologics, and devices are conducted on patient populations consisting of individuals with varying demographic, genomic, or disease characteristics
- Products may be more or less harmful or effective in certain types of patients than in others
- Some variability among subgroups of patients is expected due to chance
- Challenge is to differentiate true subgroup differences from those due to random variability – important for product approval and labeling

Subgroup Analysis

Problem statement – how to estimate subgroup specific effects:

- When subgroup sample sizes are small, estimates of effects for subgroups are subject to a large amount of random error
- Estimating the effect assuming it is the same for all patients increases the precision of the estimate but may be systematically wrong in some groups
- Regulators must decide whether to base decisions on subgroup-specific estimates of effect, overall estimates, or something in between (shrinkage estimators)
- "Bayesian estimates for subgroups tend to have fewer 'random highs' and greater precision relative to the sample estimates within the subgroups" *(Ref. Alosh, et al., 2015)*

Subgroup Analysis White Paper

Statistical Considerations on Subgroup Analysis in Clinical Trials

Mohamed ALOSH, Kathleen FRITSCH, Mohammad HUQUE, Kooros MAHJOOB, Gene PENNELLO, Mark ROTHMANN, Estelle RUSSEK-COHEN, Fraser SMITH, Stephen WILSON, and Lilly YUE

The objective of subgroup analysis of a clinical trial is to investigate consistency or heterogeneity of the treatment effect across subgroups, defined based on background characteristics. As such, subgroup analysis plays an essential role in the interpretation of the clinical trial findings. Consistency of treatment effect across trial subgroups indicates that the average treatment effect is in general applicable regardless of the specific background characteristics. Substantial heterogeneity in treatment effect may be indicative that treatment benefit pertains only to a subset of the population. However, heterogeneity in the observed treatment effect across subgroups can arise

Key Words: Bayesian subgroup analysis; Chance findings; Enrichment; Heterogeneity; Personalized medicine; Targeted and complementary subgroups.

1. Introduction

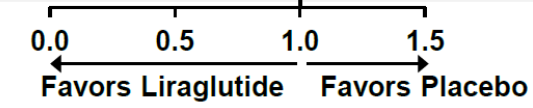
Clinical trials assess the efficacy and safety of medical products in appropriate patient populations. However, potential patient populations include individuals with varying demographic, genomic, or disease characteristics, and medical products that may be safe and effective in certain types of patients may be ineffective

Regional Subgroups Example: LEADER

CO-41

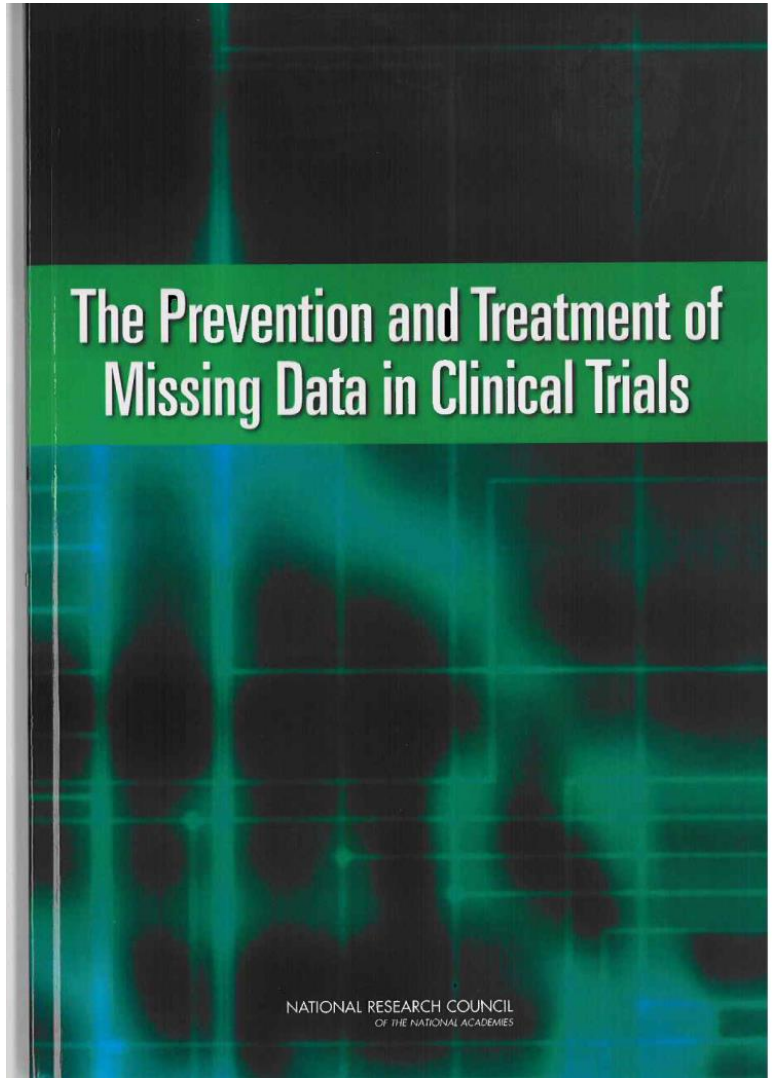
Consistent Effect on Time to First MACE Across Subgroups

Factor	N	% with MACE	Hazard Ratio (95% CI)
MACE – primary analysis	**9340**	**13.9**	**0.87** (0.78, 0.97)
Sex			
Female	**3337**	**11.7**	**0.88** (0.72, 1.08)
Male	**6003**	**15.2**	**0.86** (0.75, 0.98)
Age			
< 60 years	**2321**	**13.2**	**0.78** (0.62, 0.97)
≥ 60 years	**7019**	**14.2**	**0.90** (0.79, 1.02)
Race			
White	**7238**	**14.3**	**0.90** (0.80, 1.02)
Black or African American	**777**	**13.6**	**0.87** (0.59, 1.27)
Asian	**936**	**10.3**	**0.70** (0.46, 1.04)
Other	**389**	**16.2**	**0.61** (0.37, 1.00)
Region			
North America (US + Canada)	**2847**	**15.0**	**1.01** (0.84, 1.22)
Europe	**3296**	**13.9**	**0.81** (0.68, 0.98)
Asia	**711**	**8.6**	**0.62** (0.37, 1.04)
Rest of the world	**2486**	**14.2**	**0.83** (0.68, 1.03)



Full analysis set

Source: Sponsor's presentation at EMDAC June 20, 2017



ICH
harmonisation for better health

ICH E9(R1) Addendum reaches Step 2b of the ICH Process

4 September 2017

The ICH E9(R1) Addendum to Defining the Appropriate Estimand for a Clinical Trial/Sensitivity Analyses reached *Step 2b* of the ICH Process in August 2017 and now enters the consultation period.

The ICH E9(R1) Addendum promotes harmonised standards on the choice of estimand in clinical trials and describes an agreed framework for planning, conducting and interpreting sensitivity analyses of clinical trial data. The ICH E9(R1) draft Addendum (fileadmin/Public_Web_Site/ICH_Products/Guidelines/Efficacy/E9/E9-R1EWG_Step2_Guideline_2017_0616.pdf) can be downloaded on the Efficacy Guideline (http://www.ich.org/products/guidelines/efficacy/article/efficacy-guidelines.html#9-1) page on the ICH website.

You may provide comments on the ICH E9(R1) draft Addendum document by e-mailing the ICH Secretariat. More details under the Public Consultation (www.ich.org/products/open-consultation.html) page.

Note that stakeholders from ICH Regions are encouraged to submit their comments to their respective Regulatory Authorities.

ASA AND DATA SCIENCE

2000 PROGRAM

Joint Statistical Meetings

American Statistical Association
160th Annual Meeting

Institute of Mathematical Statistics

International Biometrics Society
Eastern North American Region
Western North American Region

Statistical Society of Canada

Celebrate Diversity in Statistics

JSM 2000
Indianapolis, Indiana
August 13-17

SPECIAL INVITED LECTURES

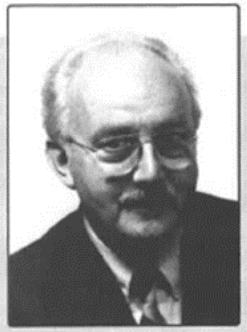
ASA President's Invited Address
TUESDAY, 8:00 PM

INVITED ADDRESS

DR. DENNIS GILLINGS
Chairman and Chief Executive Officer
Quintiles Transnational Corporation

Deming Lecture
TUESDAY, 4:00 P.M.

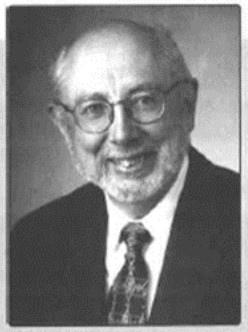
DEMING LECTURE



DR. GEORGE E. P. BOX
Professor Emeritus, University of Wisconsin and ASA Past President

ASA Presidential Address
TUESDAY, 8:00 PM

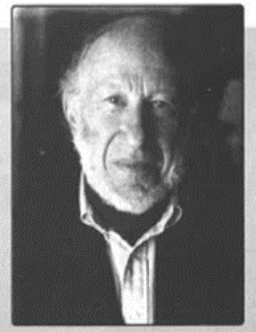
PRESIDENTIAL ADDRESS



DR. W. MICHAEL O'FALLON
Mayo Clinic
and ASA President

Fisher Lecture
WEDNESDAY, 4:00 P.M.

FISHER LECTURE



DR. INGRAM OLKIN
Stanford University

ASA and Data Science

- ASA statements and curriculum guidelines state three foundational components:
  - Mathematics
  - Statistics
  - Computer Science
- July 2017 Board Meeting
  - Met with NY Data Science Academy to discuss their program, curriculum, evaluation, and job placement
  - Discussed among Board members the possibility of accreditation in data science to ensure adequate statistical training
    - Similar to Pstat accreditation program
    - AMS having similar discussions
- April 2018 Board Meeting
  - Broad discussion on data science and ASA's role in the field
  - Consensus reached that statistical leaders will be working with, managing data scientists going forward

ASA Statement on the Role of Statistics in Data Science

1 OCTOBER 2015 10,486 VIEWS 13 COMMENTS

Statement Contributors

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Bonnie K. Ray, *Pegged Software*

Duncan Temple Lang, *UC Davis*

Hadley Wickham, *RStudio*

The rise of data science, including Big Data and data analytics, has recently attracted enormous attention in the popular press for its spectacular contributions in a wide range of scholarly disciplines and commercial endeavors. These successes are largely the fruit of the innovative and entrepreneurial spirit that characterize this burgeoning field. Nonetheless, its interdisciplinary nature means that a substantial collaborative effort is needed for it to realize its full potential for productivity and innovation. While there is not yet a consensus on what precisely constitutes data science, three professional communities, all within computer science and/or statistics, are emerging as foundational to data science: (i) Database Management enables transformation, conglomeration, and organization of data resources, (ii) Statistics and Machine Learning convert data into knowledge, and (iii) Distributed and Parallel Systems provide the computational infrastructure to carry out data analysis.

Certainly, data science intersects with numerous other disciplines and areas of research. Indeed, it is difficult to think of an area of science, industry, commerce, or government that is not in some way involved in the data revolution. But it is databases, statistics, and distributed systems that provide the core pipeline. At its most fundamental level, we view data science as a mutually beneficial collaboration among these three professional communities, complemented with significant interactions with numerous related disciplines. For data science to fully realize its potential requires maximum and multifaceted collaboration among these groups.

Curriculum Guidelines for Undergraduate Programs in Data Science*

Richard D. De Veaux,[1] Mahesh Agarwal,[2] Maia Averett,[3] Benjamin S. Baumer,[4] Andrew Bray,[5] Thomas C. Bressoud,[6] Lance Bryant,[7] Lei Z. Cheng,[8] Amanda Francis,[9] Robert Gould,[10] Albert Y. Kim,[11] Matt Kretchmar,[12] Qin Lu,[13] Ann Moskol,[14] Deborah Nolan,[15] Roberto Pelayo,[16] Sean Raleigh,[17] Ricky J. Sethi,[18] Mutiara Sondjaja,[19] Neelesh Tiruviluamala,[20] Paul X. Uhlig,[21] Talitha M. Washington,[22] Curtis L. Wesley,[23] David White,[24] and Ping Ye[25]

Annu. Rev. Stat. Appl. 2017. 4:2.1–2.16

The *Annual Review of Statistics and Its Application* is online at statistics.annualreviews.org

This article's doi: 10.1146/annurev-statistics-060116-053930

*Author affiliations can be found in the Acknowledgments section.

Keywords

curriculum, statistics education, computer science education

Abstract

The Park City Math Institute 2016 Summer Undergraduate Faculty Program met for the purpose of composing guidelines for undergraduate programs in data science. The group consisted of 25 undergraduate faculty from a variety of institutions in the United States, primarily from the disciplines of mathematics, statistics, and computer science. These guidelines are meant to provide some structure for institutions planning for or revising a major in data science.

Success, Opportunities, and Challenges for Statistics and Biostatistics in the Data Science Era

A Report of the July 2016 NSF-Sponsored Workshop for Chairs of Departments of Biostatistics and Statistics

ASA

BUILDING FOR THE FUTURE

Leadership Training

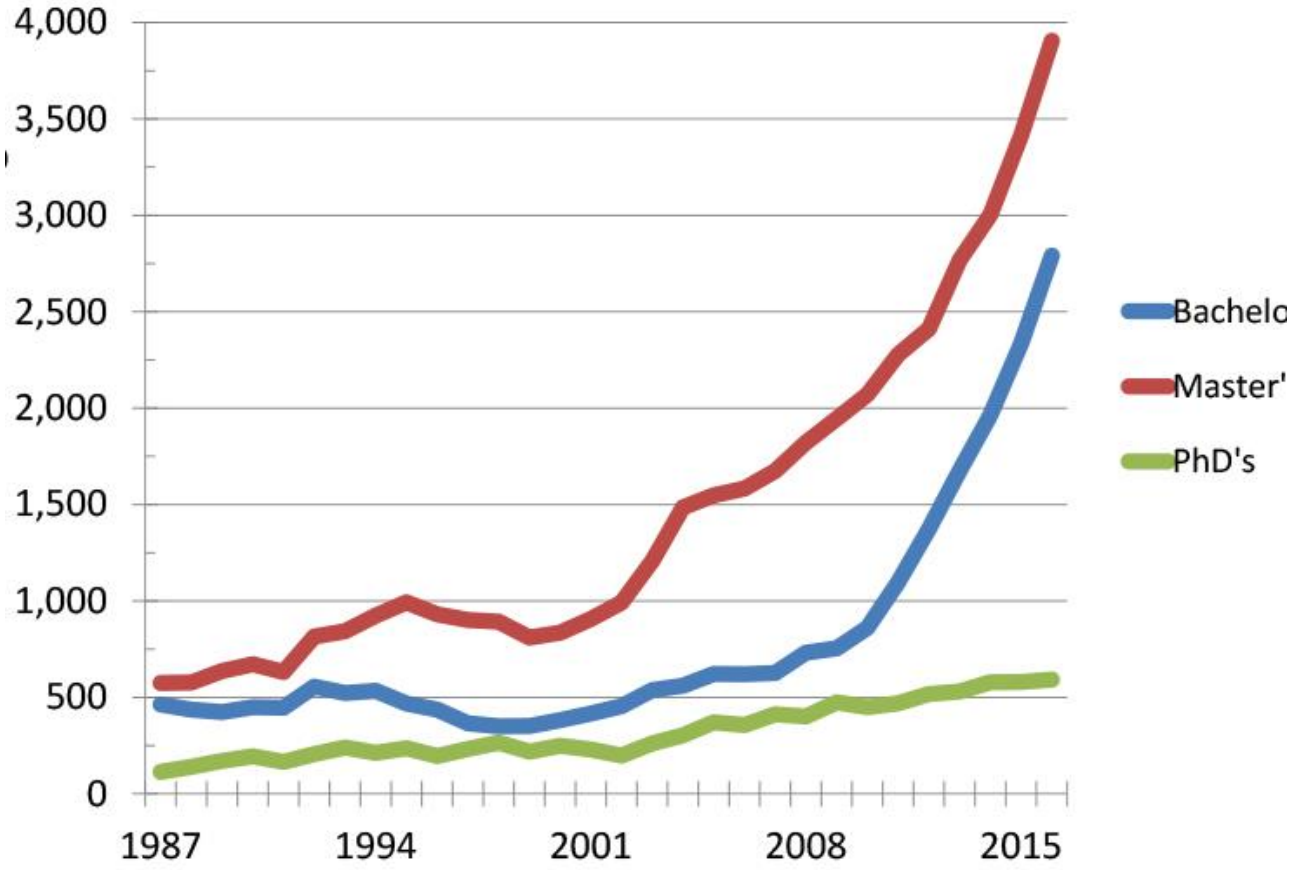
Statistics as a Profession

- Bachelor's and Master's degrees continue to grow
- Doctoral degrees fairly constant
- Proliferation of programs in Data Science and Advanced Analytics is astounding (>500 to date)

Statistics and Biostatistics degrees

Amstat News Oct. 2017

Source: NCES IPEDS



Training Statisticians

- Statistical knowledge and skills are essential
- In-depth understanding of content area as well

→To have a seat at the decision-making table

→To be scientific collaborators, not just consultants

- Formal educational training is just the beginning
  - Field is always evolving
  - Staying current while on the job can be challenging
  - Learning how to think, to problem-solve is critical in keeping current

Training Statisticians

- Probability and statistical inference
  - Theory and application
- Specialty areas, e.g., clinical trials, statistical genetics, sample surveys
- **Data Science**
- **Leadership**

Leadership Training

- Curriculum*
  - Vision and strategic thinking
  - Communication
  - Diversity
  - Ethics
  - Basic management skills and financial literacy
  - Transformational leadership, empowerment, and innovation
  - Personal leadership styles
  - Organizational leadership and culture
  - Conflict resolution
  - Decision making and decision analysis

**Curriculum from Biostatistics 844, University of North Carolina at Chapel Hill, Fall, 2018*

ASA Leadership Institute

2018 Presidential Initiative

1. Support development of leaders of statistics groups/organizations – *assigned leadership*
2. Support development of leaders of multi-disciplinary groups -- *emerged leadership*
3. Offer elements of statistical leadership to leaders of other disciplines

ASA LEADERSHIP INSTITUTE Steering Committee

- **Michael Rappa** – Goodnight Director and Distinguished University Professor, Institute for Advanced Analytics at North Carolina State University

- **Bob Rodriguez** – Senior Director in SAS Research and Development and former ASA President

- **Aarti Shah** – Senior Vice President and Chief Information Officer and former Vice President of Biometrics and Advanced Analytics at Eli Lilly and Company

- **Erica Groshen** – Visiting Senior Scholar at the Industrial and Labor Relations School at Cornell University and former Commissioner of Labor Statistics (2013–2017)

- **Debbie Hughes** – Vice President for Higher Education and Workforce Development at the Business and Higher Education Forum

ASA Leadership Institute

- Steering Committee met Jan. 23 to brainstorm about initiatives
- Identified three points in a statistician's career for leadership training:
  - Pre-career
  - Early- to mid-career
  - Mid- to late-career
- Different objectives at each stage
- Different opportunities for engagement

2018 Launch – Three Initiatives

- Pre-career: Future Leaders Program
  - 5-student teams recruited through ASA student chapters
  - Coaching provided to solve a leadership challenge problem
  - Present solutions to ASA Board in April 2019
- Early- to mid-career:
  - Extend current JSM short course to offer more in-depth training
  - Open to JSM 2018 workshop registrants plus past cohorts
  - Learning opportunities planned in-person and via web
- Mid-late career:
  - Engage 'C-suite' leaders to understand organizational needs
  - Identify resources to provide for members seeking to take the next leadership step
  - Roundtable co-sponsored by BHEF to include executives from industry, academia, and government

5 Teams Selected; Met with coaches at JSM; Webinar Series planned for fall/winter

Mid-Career Leadership Training

- Pilot-test as year-long follow-up to JSM 2018 Leadership Workshop
- 3 Modules offered between Fall 2018 and Spring/Summer 2019

1. Cultural Competency in Leadership
2. Decision making and decision analytics
3. Communicating with the C-Suite, or Executive Presence for Statisticians

Mid-Career Workshops

- 20 Attendees
  - 8 from JSM 2018 Leadership Course
  - 12 alums from prior JSM courses
- Guest speakers from FDA and Industry
- Focus on diversity and leadership

Leading with Cultural Competency
October 12 - 13, 2018

C-Suite Roundtable

Convene C-suite executives from industry and academia to provide insight into their organizational leadership models and training needs, and ultimately champion ASA activities.

Summary

- Opportunities for statistical leadership in every sector
  - Can have high impact from leading in non-traditional ways
- Training begins early and continues throughout your career
  - Statistics training, but also soft-skills training, including leadership skills
- Presidential initiative to develop an ASA Leadership Institute
  - Supports membership at all career stages
  - Provides a home for ASA professional development offerings
  - Is sustaining
  - Strives to become a recognized resource in leadership training, for statisticians and beyond
  - Theme: **#LeadWithStatistics**