

Biostatistics in the Upcoming Brave New World: Opportunities and Challenges

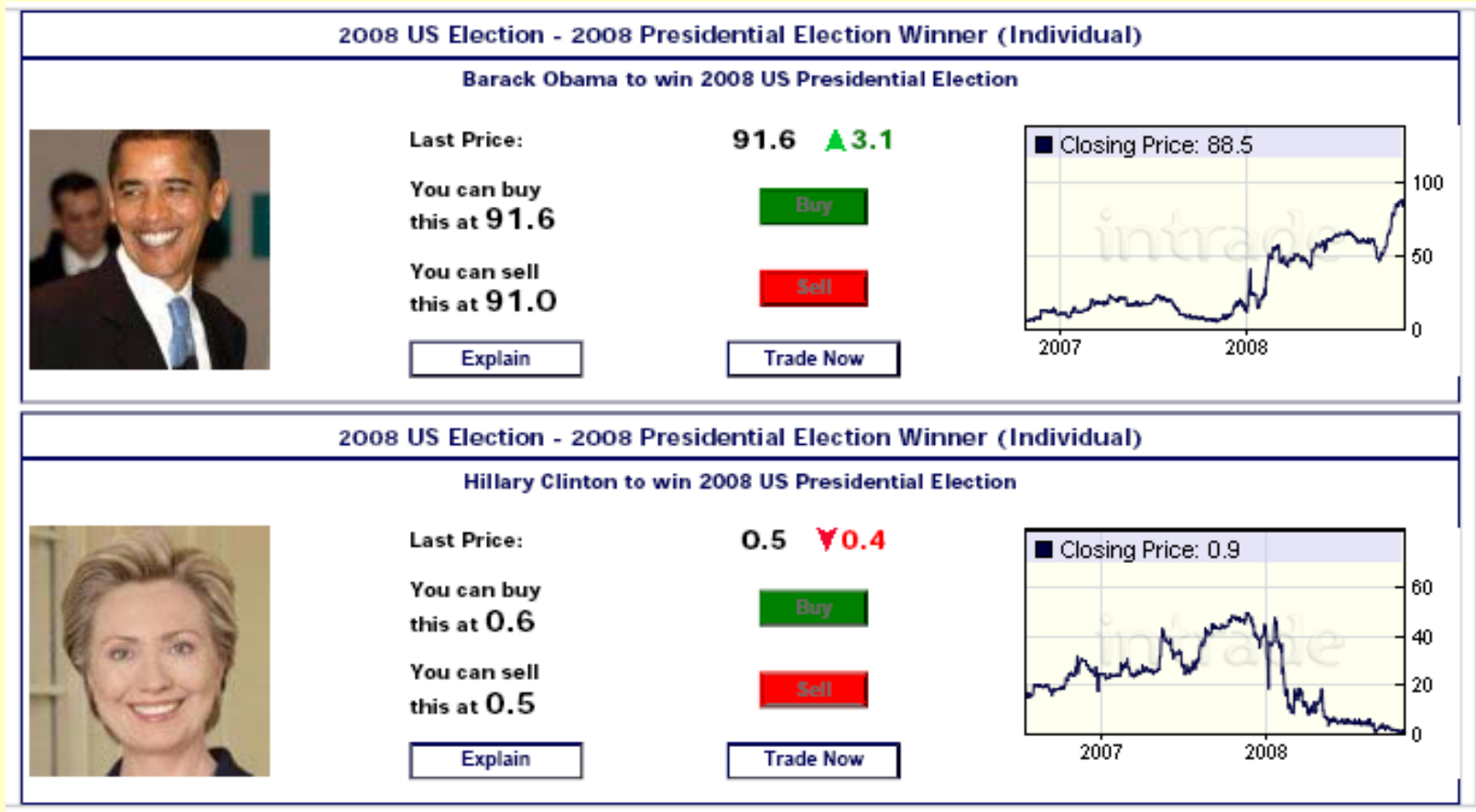
November 4, 2008

**Naihua Duan, Ph.D.
Columbia University and
New York State Psychiatric Institute**

Outline

- Obama's campaign/movement is likely to bring about fundamental changes to the US society
- Biostatistics can be a powerful tool in this transformation
- New tools and new priorities might be needed for biostatistics to meet the new challenges

Obama Campaign: Against All Odds



Obama Movement: Deep Community Roots

- Mobilization of diverse communities
- Emphasis on a “bottom up”, “grounds up” perspective
- Facilitated by extensive use of information technologies
- Broader context: society at large
- Specific context: CHIPTS/CCH/HSRC/EXPORT

Biostatistics as a Tool for Transformation

- Historical accomplishments
 - RCT, EBM, control of infectious diseases, environmental risk management...
- Knowledge is power
 - Now with rapid turn-around
- Traditionally aligned with top-down structure
 - Can be expanded to accommodate bottom-up structure?
- Build upon information technology

New Tools and New Priorities

- Build on existing tools for an expanded scope to meet the new challenges
- Some ideas for brainstorming:
 - Public health informatics, environmental and public health surveillance
 - Community empowerment in research methodology
 - Community-based evaluation design
 - Respondent-driven sampling and peer-driven intervention

Public Health Informatics and Surveillance

- Systematic application of information and computer science and technology to public health practice, research, and learning
- Networked surveillance
 - Ambient air monitoring vs. indoor air quality surveillance
 - Community input and feedback
 - Design, information retrieval, interpretation

Community Empowerment in Research Methodology

- Methodology is usually a barrier for community participation in research and/or investigations
- Community empowerment in methodology can be a powerful tool in community mobilization
- Jae and Ron's experience in MS Excel training for CBO's

Community-Based Evaluation Design

- User-friendly designs such as need-based allocation (“regression-continuity design”)
- Internal evaluation for quality improvement vs. external evaluation for program implementation
 - Consideration of time horizon for internal consumption of knowledge
- Community input in research design

Respondent-Driven Sampling

- Doug Heckathorn, Sociology, Cornell University
 - <http://www.respondentdrivensampling.org/>
- Snowball sampling combined with a mathematical model that weights the sample to compensate for the fact that the sample was collected in a non-random way
- Potentially useful for community-based research to provide both information about individuals and their social relationship
- Especially useful for hidden populations

Peer-Driven Intervention

- Traditional provider-client model might not take full advantage of capacity for intervention recipients to participate actively beyond a passive role as clients
- Peer-driven intervention facilitates active participation for all participants
- Intriguing evaluation issues

Discussions

- On-going trend towards a bottom-up organization facilitated by information technology
- Obama movement is synergistic with, and reinforces, this trend
- Biostatistics can play an important role in this transformation, with the aid of new tools and new priorities