

Project shows benefits of applying sex and gender analysis in research

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Gendered Innovations in Science, Health & Medicine, and Engineering at Stanford University 'was created through a unique international collaboration of scientists, engineers and gender experts,' said Founder and Director Londa Schiebinger. Credit: L.A. Cicero

In the United States and Europe, osteoporosis is considered primarily a "woman's disease" and men are rarely evaluated for the condition, which causes bones to become weak and brittle, and increases the risk of wrist, hip and spine fractures.

Yet recent research has shown that nearly one-third of American and European men will experience a [hip fracture](#) linked to the [bone disease](#).

So it's actually a "man's disease" too, says Londa Schiebinger, founder and director of Gendered Innovations in Science, Health & Medicine, and Engineering, citing the findings of the project's case study, *Osteoporosis Research in Men: Rethinking Standards and Reference Models*.

While gender bias had long obscured the plight of men who were silently suffering from osteoporosis, shining the light of sex and gender analysis on the problem led to better ways to evaluate their fracture risks, she said.

"We reviewed the existing research on osteoporosis and identified how applying sophisticated methods of sex and gender analysis improved the science and led to a new conception of the disease," said Schiebinger, the John L. Hinds Professor of History of Science at Stanford.

Future advances aim at preventing, diagnosing and treating [osteoporosis](#) in men, which strikes them in their 70s, about 10 years later than women, and could help improve - and prolong - the lives of elderly men.

"When men break their hips they don't survive as well as women do - and no one yet knows why," Schiebinger said.

Case studies available

Since Schiebinger launched the Gendered Innovations project in the summer of 2009, the project has produced 14 case studies to demonstrate how applying sex and gender analysis to research studies has helped create new knowledge and technologies.

The project was initiated with start-up funding from Stanford's Michelle R. Clayman Institute for Gender Research. Schiebinger, a former director of the Clayman Institute, is the editor of the 2008 book, *Gendered Innovations in Science and Engineering*.

All the project's peer-reviewed case studies can be found on its website, including:

- Stem Cells: Analyzing Sex
- Animal Research: Designing Health and Biomedical Research
- De-Gendering the Knee: Overemphasizing Sex Differences as a Problem
- Heart Disease in Women: Formulating Research Questions
- Pregnant Crash Test Dummies: Rethinking Standards and Reference Models

• Water: Participatory Research and Design

"The website is a resource for researchers," Schiebinger said. "It's globally accessible and freely available to anyone with an Internet connection."

An international cast of contributors

The Gendered Innovations project was developed through six international workshops. In 2011, the European Union joined the project, followed by the U.S. National Science Foundation in 2012.

"The project was created through a unique international collaboration of scientists, engineers and gender experts," Schiebinger said.

The first workshop was held at Stanford in 2011 and the seventh - and last - will be held in September in Brussels, at the headquarters of the European Commission.

Last week, Schiebinger traveled to Harvard University for a two-day workshop focused on three new case studies - on brain research, robots for the elderly and natural language processing.

There, she met her three co-directors - professors of gender medicine, urban planning and engineering from universities in The Netherlands, Madrid and Berlin - as well as 18 invited experts from across the [United States](#) and [Europe](#), including a research scientist at Google Inc. and Dan Jurafsky, a professor of linguistics at Stanford.

"These workshops are exhilarating," Schiebinger said. "We bring technical experts - from completely unrelated fields - into conversation for interdisciplinary exploration. We attempt to capture for our website users the 'ah-ah' moments these workshops produce."

State-of-the-art methods

The project has developed 11 methods of sex and gender analysis - also peer-reviewed - as a research roadmap for scientists and engineers. Schiebinger said new methods will be developed and added to the website as circumstances change.

"Researchers will want to consider all methods and think creatively about how these methods can enhance their own research," she said. "Our message is that researchers need to design sex and gender analysis into their project from the very beginning."

She said research has shown that sex and gender bias can be harmful and expensive.

"Between 1997 and 2000, 10 drugs were withdrawn from the U.S. market because of life-threatening health effects, and eight of them had more severe side effects in women," she said. "Developing those drugs cost billions of dollars and inestimable human suffering and death. So we have a very strong reason to be looking at sex and gender differences in medicine."

Schiebinger said the same is true for technology.

"Technologies - whether crash-test dummies, synthetic speech or assistive technologies - should provide equally safe, useful, and aesthetically pleasing results for both men and women of differing ages and cultural backgrounds," she said.

"Overall, the Gendered [Innovations](#) project demonstrates that considering sex and gender in the "discovery" phase of a [project](#) enhances creativity and excellence in science and engineering."

Provided by Stanford University

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