

# Statistical Consulting

## What is it, and why is it important?

STAT8801  
Statistical Consulting

School of Statistics  
University of Minnesota

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Welcome to STAT8801, Statistical Consulting.

- Who are you? What's your preferred name?
- Where are you from? Country? State? Department?
- Why are you in statistics?
- Do you hope or expect to do statistical consulting someday?

## What is Statistical Consulting?



From the ASA Section on Statistical Consulting:  
“Statistical consulting is the most challenging and most rewarding part of statistics. A consultant uses the art and science of statistics to solve a practical problem.”

Too general. What's missing?

## Derr's First Line

Derr (2000) begins:

*Statisticians often work with people in other professions and disciplines.*

Here is the key: Consulting is working with people in other fields. Sometimes it is merely working for someone, other times it is working together.

Cabrera and McDougall (2002) add the following:

*Ultimately, [statistical consulting] is about communication . . .*

*The statistical consultant is a problem solver . . . [who] needs to have a strong interest in science, and, in particular, the art of scientific discovery.*

Hyams (Biometrics, 1971) described the ideal consultation:

*. . . The 'Ideal Consultation' is not a consultation. It is a working-together, a voluntary meeting of minds and union of energies whose prime aim is to seek a 'truth'. In such meetings both parties are familiar with each other's basic language. . . .*

Here the science drives new statistics and the statistics supports good science.

## What is consulting?

So...

essentially anything statistical that isn't sitting alone in your office doing research or teaching/taking a class is **statistical consulting**.

In this sense, almost all<sup>1</sup> statistics is statistical consulting, and most of the rest is inspired by consulting-type problems.

<sup>1</sup>Except on a set of measure zero.

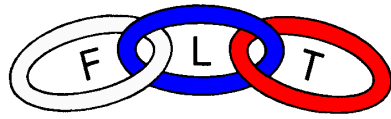
## Why Are Statistical Consulting Skills Important?

based on Sandy's talk:

How to Talk about Statistics. . .

to Smart People who don't know the difference between an **Odds Ratio** and an **Odd Fellow**

## An Odd Fellow?



The Sovereign Grand Lodge  
Independent Order of Odd Fellows

- Social and mutual-aid society started in 17th century England to "... benefit all mankind in Friendship, Love and Truth."
- Established in the US in 1819.
- Included women, an innovation, in 1851.
- Established homes for senior members and for orphaned children; still runs nursing homes.



## An Odds Ratio...

1974 New York Births

	Dead	Alive	Total
Low Birth Weight	618	4597	5215
Normal Birth Weight	422	67093	67515
Total	1040	71690	72730

$$\text{Odds ratio: } \frac{618/4597}{422/67093} = 21.4$$

## Odd Fellows and Odds Ratios

- Odd fellows, and groups like them, seek to help themselves and others, thereby repairing the world.
- Odds ratios, and other statistical methods, can help us understand the way the world works.
- This knowledge should be used by us to repair the world.

## Michael Ball

a “human rights statistician”



- testified against (and was cross examined by) Serbian dictator Slobodan Milosevic
- helped show ethnic cleansing in Kosovo
- has also worked in South Africa, Haiti, Guatemala, East Timor, and Peru

## Communication is Important

Communication is Important...

**But HARD!**

This course may be the only chance you get to learn about communicating with non-statisticians.

## Themes of this Course

- Communication
- Teamwork
- Technical Tools
- Ethics
- Professional Practice