

LEVERAGING THE FIELD STATISTICIAN TO ENSURE HIGH QUALITY IMPACT EVALUATIONS

Marcos Carzolio

Interdisciplinary Statistical Collaborator

- Applied Mathematician and Statistician
- Over 45 different collaborative research projects
- Taught short courses on survey methods
- Worked remotely on 3 separate impact evaluation projects



Rural Water Supply Activity Project

- ❑ Funded by Millennium Challenge Corporation (MCC)
- ❑ Located in Nampula
- ❑ Install 600 clean water sources
- ❑ Provide sanitation education
- ❑ Evaluate socioeconomic impacts
- ❑ Measure water quality
- ❑ Disseminate findings





Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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US Dept of State Geographer
Image Landsat

Google earth

From Traditional Wells to Handpumps



Results of Interest

- Volume of water used
- Access to improved water
- Time collecting water
- Child school attendance
- Child health
- Latrine usage
- Income and expenditures
- Water quality



Study Methods

- ❑ 1,826 household interviews in follow-up
- ❑ Interviewed community leaders
- ❑ Interviewed water committees
- ❑ Tested water quality
- ❑ Observed water points
- ❑ Enumerator training
- ❑ Three enumerator teams
- ❑ Field statistician



What is a Field Statistician?

- Involved at **every step** of the research process:
 - ▣ Research question development
 - ▣ Sample frame selection
 - ▣ Data collection
 - ▣ Data processing
 - ▣ Data analysis
 - ▣ Publication



My Role as a Field Statistician...

- Meet with interested parties
- Train enumerators
- Process data as collected
- Manage data
- Identify outliers
- Verify or correct outliers
- Ensure data quality
- Perform analyses in field
- Communicate results



Day-to-Day: Morning

- Drive out to rural villages to meet with enumerators
- Verify or correct outliers
- Retrain enumerators if necessary

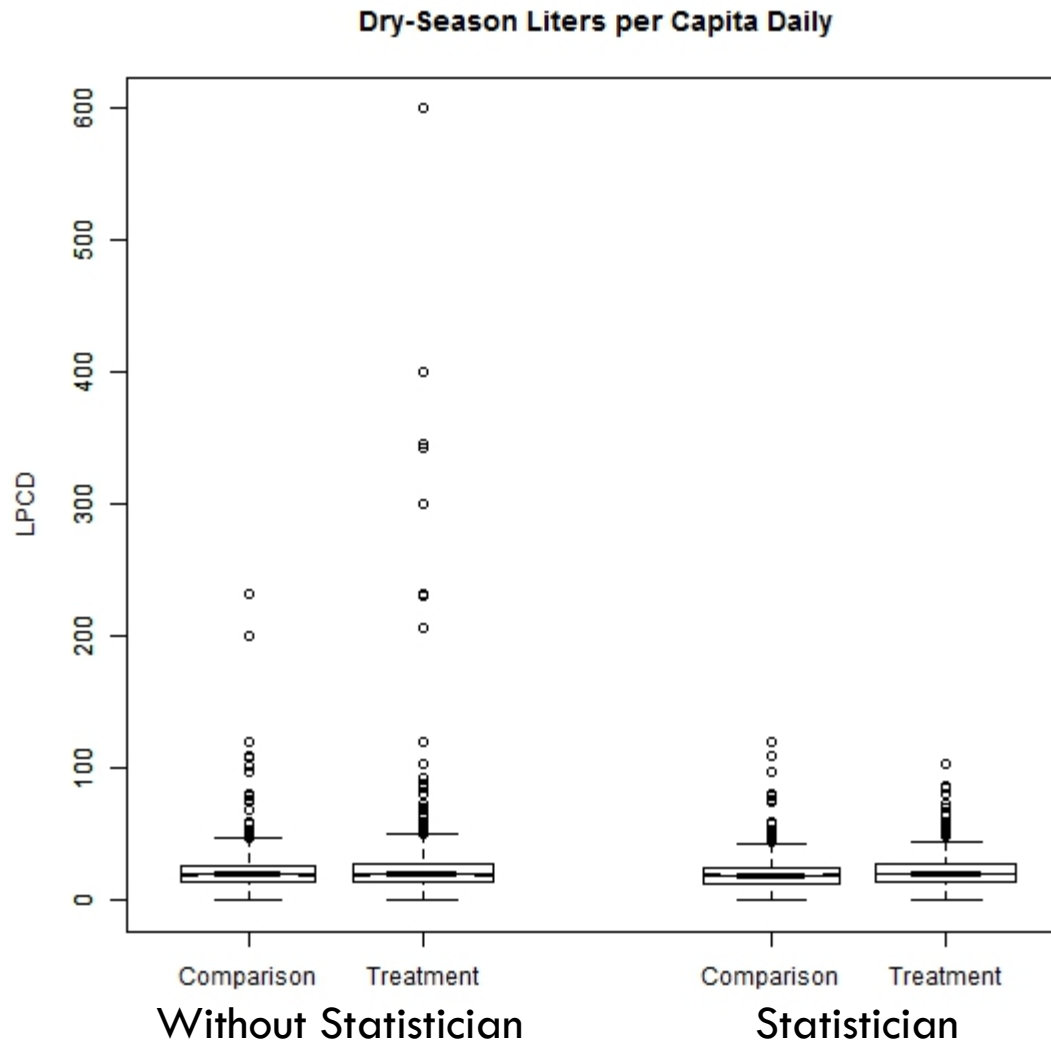


Day-to-Day: Afternoon

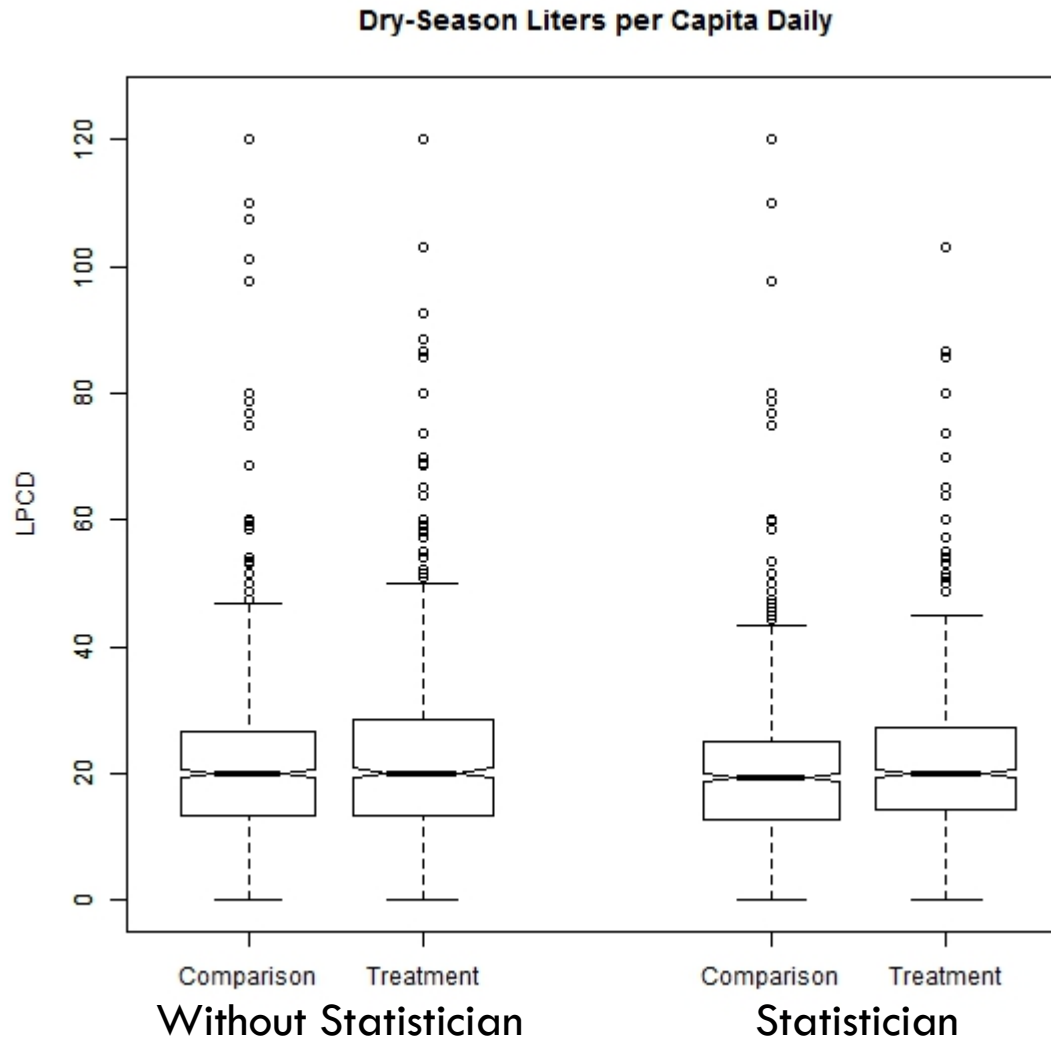
- Clean data and prepare error reports
- Analyze currently available data for field reports
- Set up tent
- Play with local children



How does a Field Statistician contribute to **impact evaluation research**?



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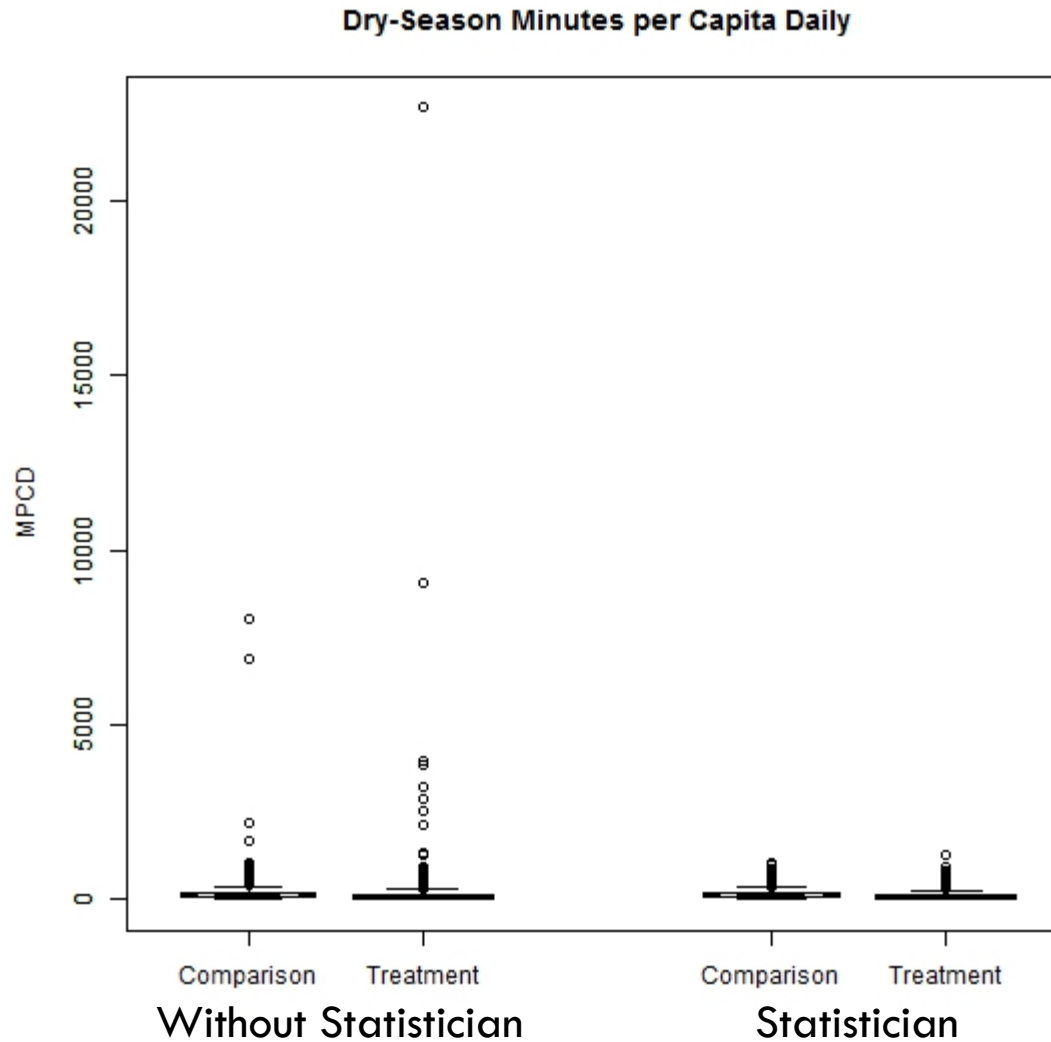
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Liters per Capita Daily Estimates

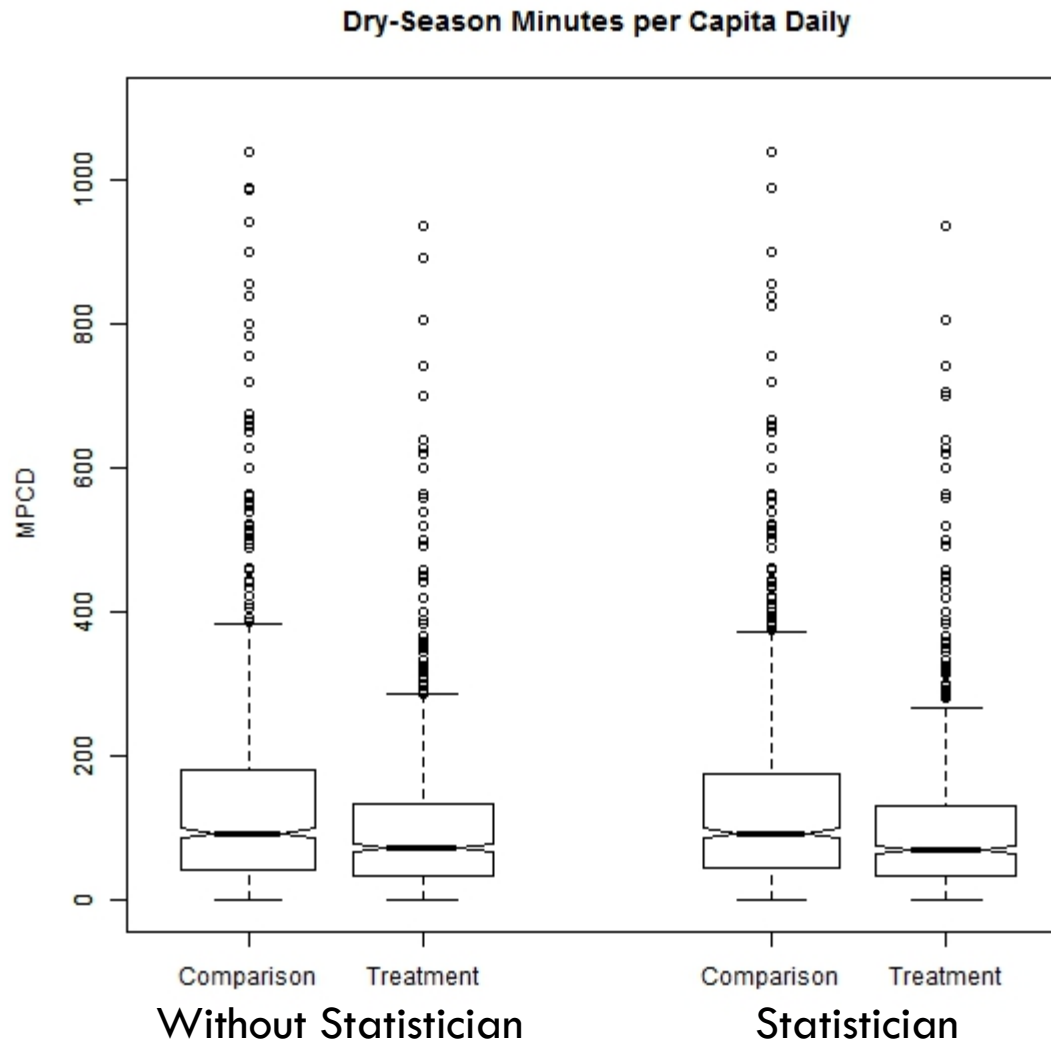
| | Estimate | Estimate | Std. Error | Std. Error | Pr(> t) | Pr(> t) |
|-------------|----------|----------|---------------|---------------|------------|------------|
| (Intercept) | 22.4136 | 20.4452 | 0.9205 | 0.4050 | <2e-16 *** | <2e-16 *** |
| HANDPUMP | 2.6540 | 1.6160 | 1.2773 | 0.5639 | 0.0379 * | 0.00421 ** |

- Decreased standard errors
- More accurate estimates of effects

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Minutes per Capita Daily Estimates

| | Estimate | Estimate | Std. Error | Std. Error | Pr(> t) | Pr(> t) |
|-------------|----------|----------|---------------|---------------|--------------|--------------|
| (Intercept) | 157.756 | 133.566 | 22.917 | 4.402 | 8.06e-12 *** | < 2e-16 *** |
| HANDPUMP | 2.516 | -28.206 | 31.721 | 6.126 | 0.937 | 4.43e-06 *** |

- Decreased standard errors
- Significant outcome

Embedding a Statistician in the Field Produces...

- Quality Study Design
- Clean Data in Real Time
- Quick, High-Level Analyses
- Expert in the Dataset

