



# Sampling for Conflict Areas

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# Background

- Standard approach:
  - stratified cluster survey to select EAs
  - household listing operation
- Special case of Mogadishu
  - EA maps and estimated population counts available
  - but listing was prohibitively dangerous
- Requirement for a new design:
  - limited time in the field
  - representative

# Sampling Options

- 5 options compared
  - Satellite Mapping
  - Segmentation
  - Grid / Geosampling
  - Qibla method
  - Random Walk

# Satellite Mapping

- How it works:
  - Identify each structure in image
  - Select simple random sampling
  - Get coordinates of selected units
- Pros:
  - Good coverage, if image up-to-date
  - Weights straightforward
- Cons:
  - Multi-unit buildings
  - Uninhabited buildings, commercial buildings



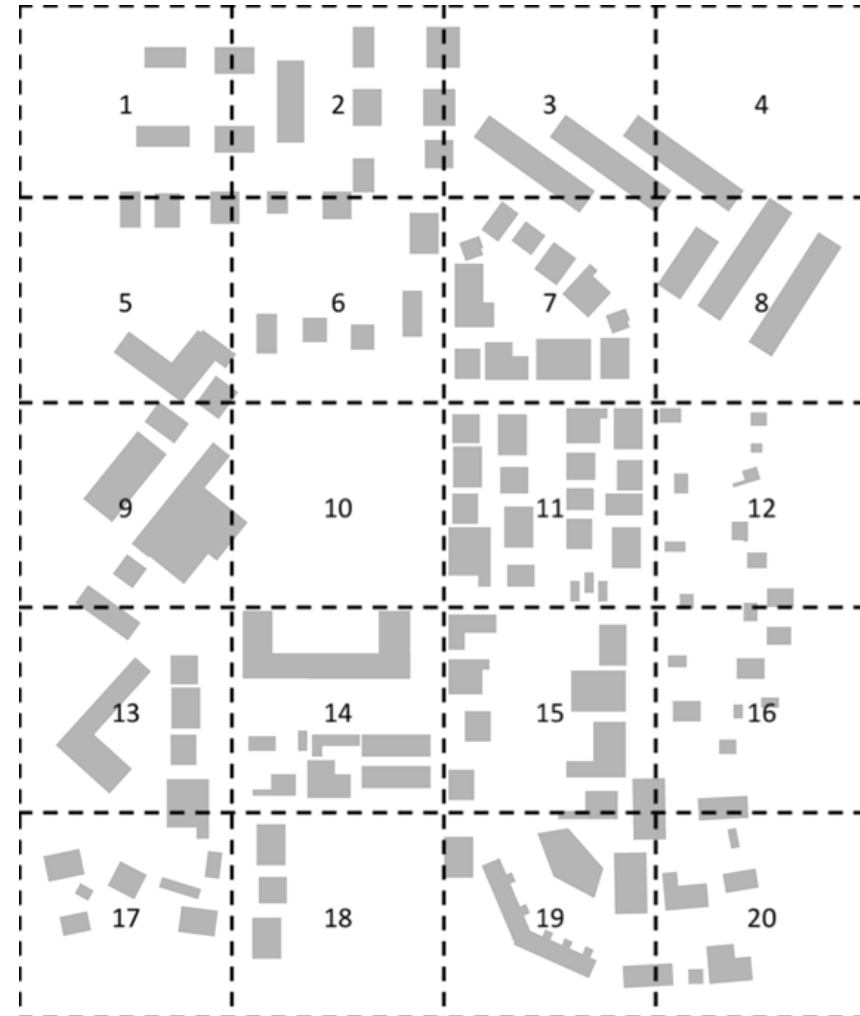
# Segmentation

- How it works:
  - Divide PSUs into given size chunks
  - Select segments SRS
  - List segments and interview
- Pros:
  - Weights straightforward
- Cons:
  - Manual work
  - Interviewers must identify boundaries in the field



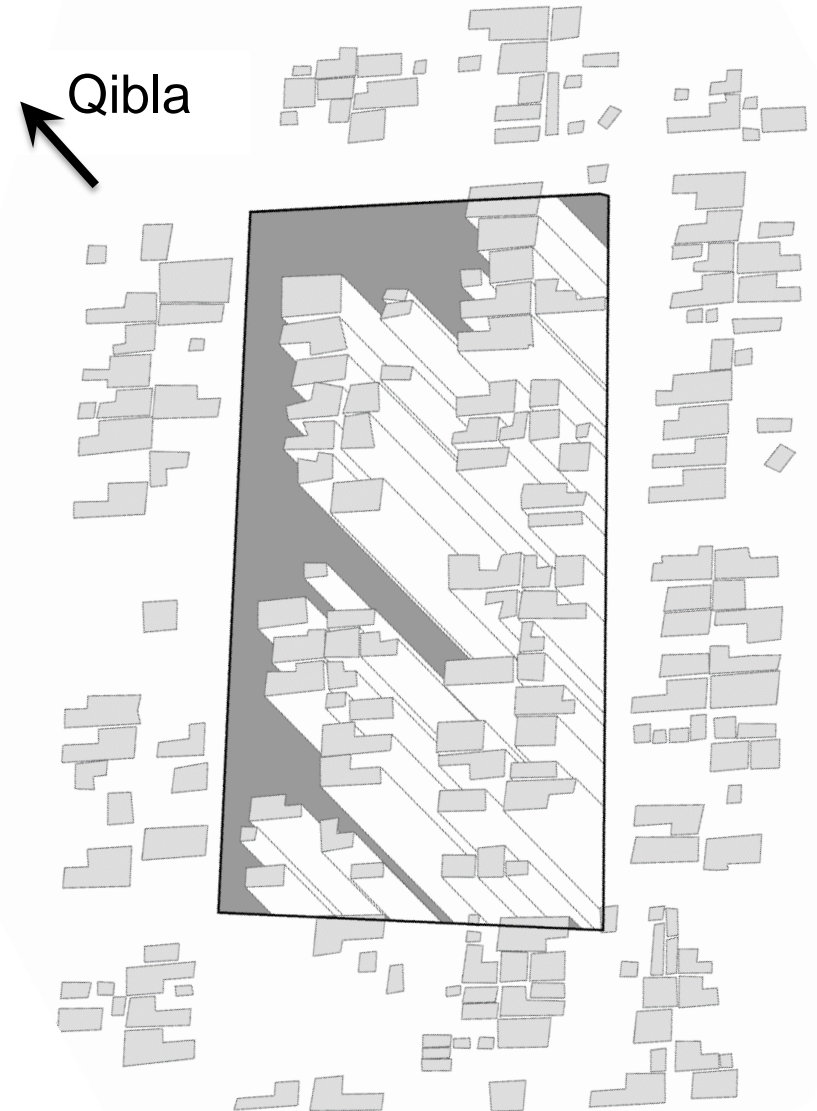
# Grid / Geosampling

- How it works:
  - Overlay grid
  - Select squares (SRS, PPS)
  - List segments and interview
- Pros:
  - Weights straightforward
  - Easier to find in field
- Cons:
  - Buildings that cross squares?

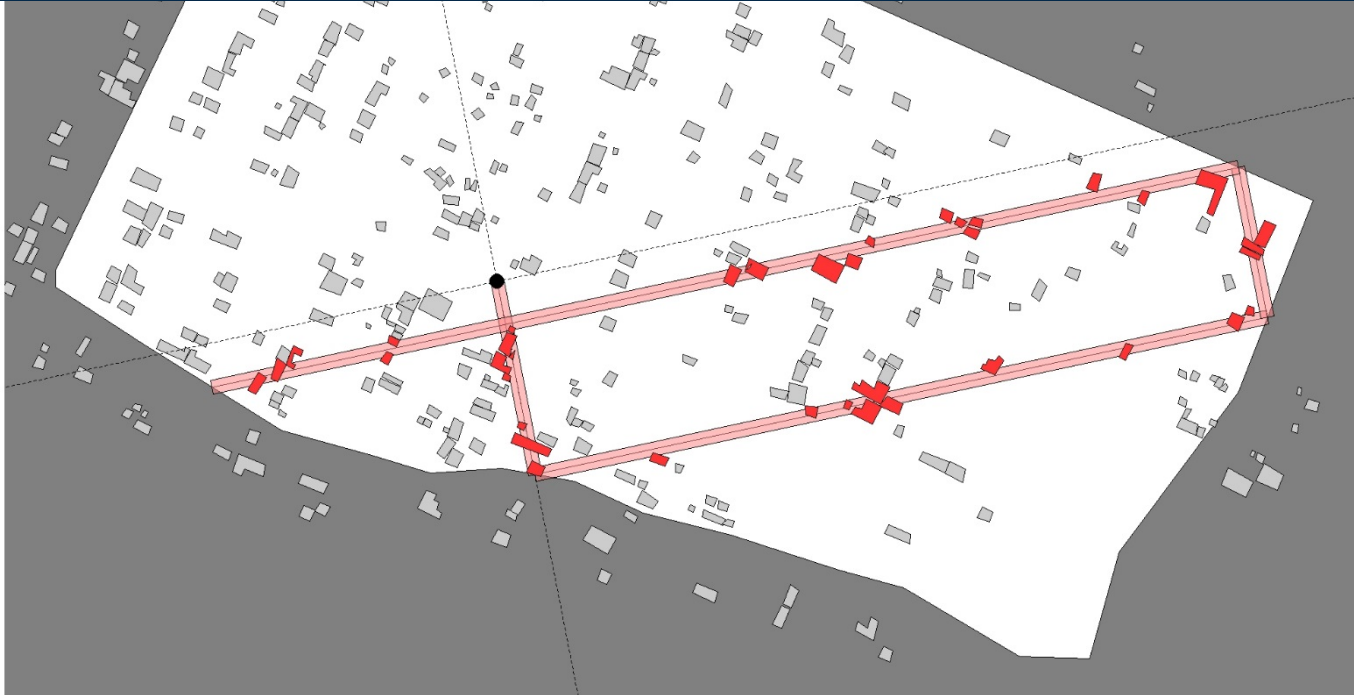


# Qibla Method

- How it works:
  - Select random points
  - Walk from point to structure
  - Qibla is direction for prayer
- Pros:
  - Easy to implement
- Cons:
  - Some points lead out of PSU
  - Weights complex



# Random Walk



- Pros:
  - Easy to implement (?)
- Cons:
  - No probabilities of selection
  - Interviewer discretion



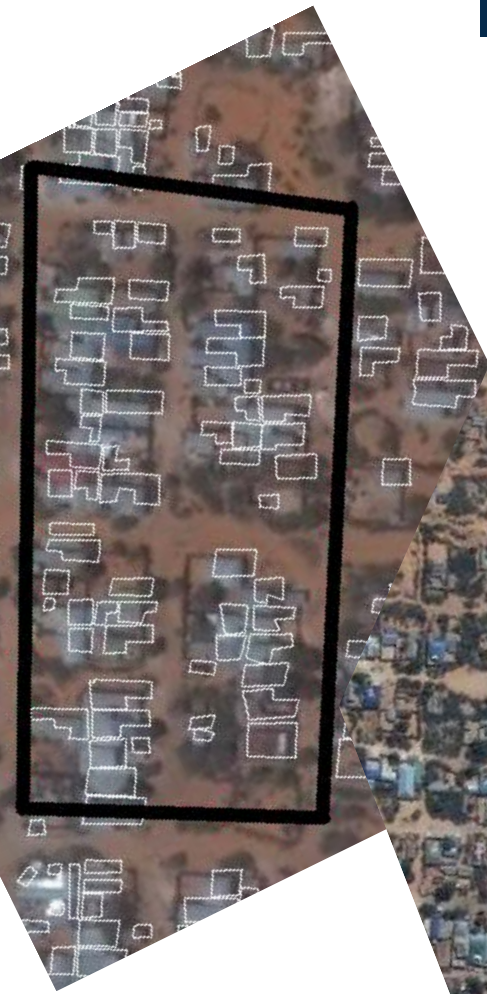
# How We Tested Methods

- 3 PSUs in Mogadishu
- Assigned consumption values to HHs
  - At random
  - Somewhat clustered
  - Very clustered
- Conducted as part of the Mogadishu High Frequency Survey, a face-to-face household survey conducted from October to December 2014 in Mogadishu, Somalia, by the World Bank Group and Altai Consulting.

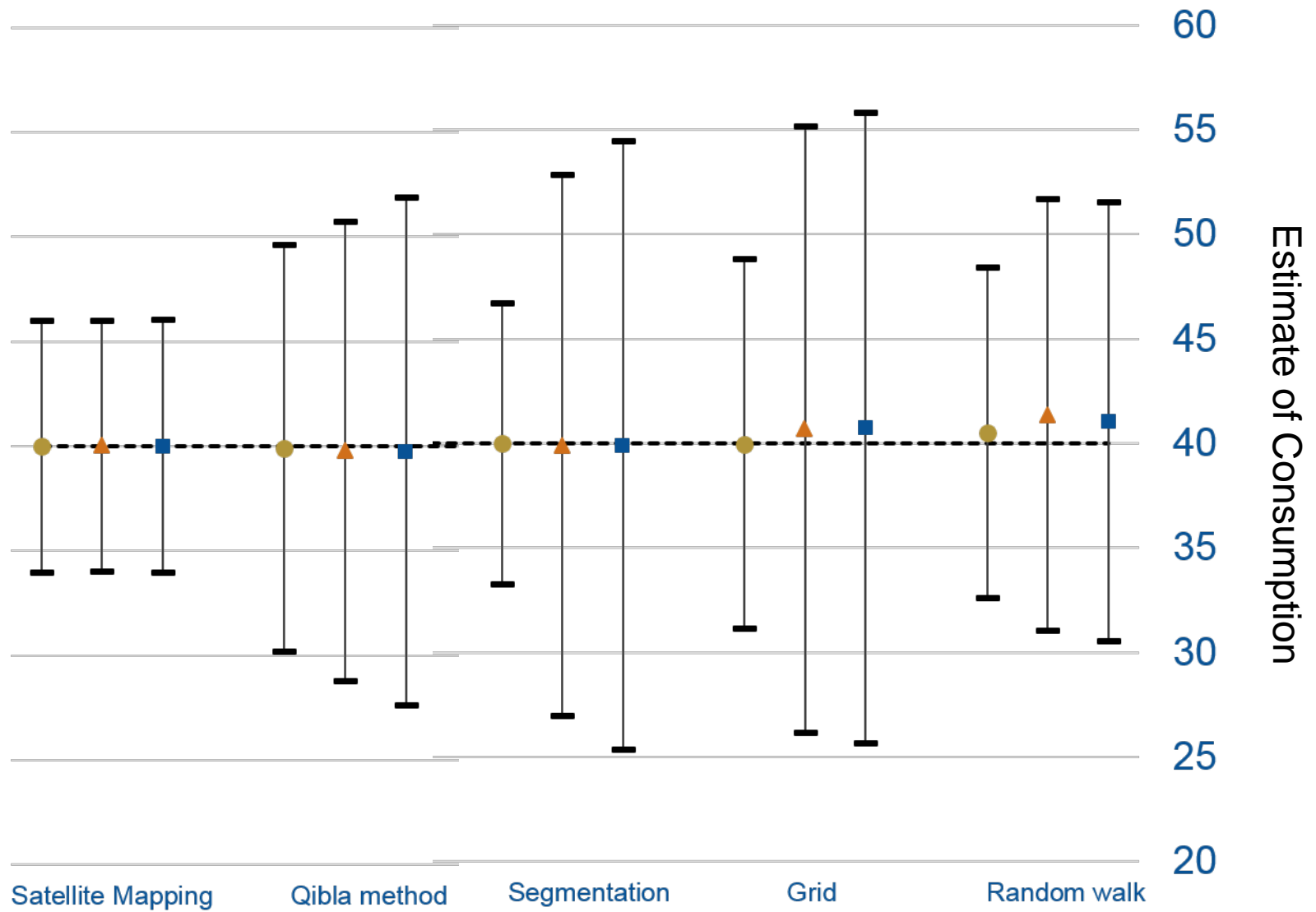
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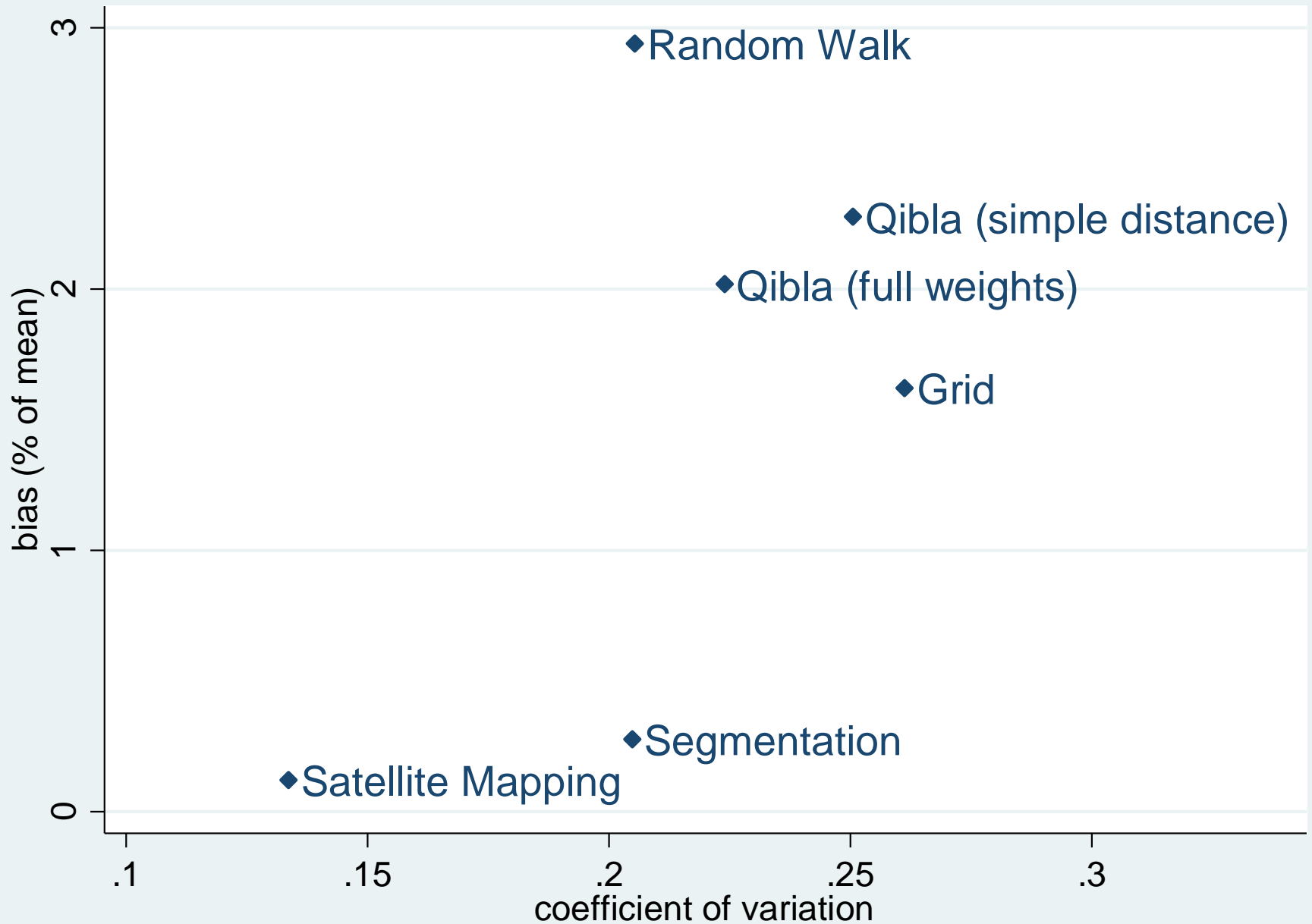
Heliwa



# Results



# Results



# Results – Bias & Precision

- Satellite mapping unbiased, smallest coefficient of variation
  - If map is good
- Segmentation unbiased bias
  - additional level of selection decreased the precision
- Grid theoretically unbiased
  - did not perform as well in simulations because of small n
- Random walk very biased
- Qibla may be inexpensive alternative

# Results – Clustering in Y

- If Y randomly assigned – all methods work well
- Clustering in Y reduces precision
  - Segmenting, gridding
- Random walk showed did not show a steady relationship between clustering and precision

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Papers:

“Second-Stage Sampling for Conflict Areas”  
World Bank Policy Research Working Paper  
**WPS7617** <http://goo.gl/K44HVS>

“New Ideas in Sampling for Surveys in the  
Developing World” *Advances in Comparative  
Survey Methods: Multicultural, Multinational  
and Multiregional Context*

“Sampling Nomads: A New Technique for  
Remote, Hard-to-Reach, and Mobile  
Population” *Journal of Official Statistics*  
<http://goo.gl/5ICAYk>