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Predicting the Coverage of Address-Based Sampling Frames Prior to Sample Selection

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National Survey on Drug Use and Health (NSDUH)

Target population:

Civilian, non-institutionalized population 12 and older

- Households (HHs) and
- Non-institutional group quarters (GQs)

Data collected quarterly in all 50 states and DC

- 7,200 local areas known as *segments*
- 140,000 screenings and 67,500 interviews completed annually

Field Enumeration (FE) for the NSDUH

- Frame construction requires field staff to completely enumerate a local area or *segment*
- Coverage supplemented during screening process

Costs Associated with Field Enumeration (FE)

- Lister training and field work
- Map production
- Field support during listing
- Processing of listing data
- Half-open interval

Address-Based Sampling (ABS)

Pros:

- Less costly
- Faster
- Enables larger segments

Con:

- Undercoverage in:
  - rural areas
  - group quarters

Costs Associated with Address-Based Sampling (ABS)

- Purchase of address lists
- Map production
- Implementation of the CHUM:
  - Interviewer training and field labor
  - Field support

NSDUH Field Study

Objective:

Develop and test an ABS/FE hybrid frame that provides cost savings without sacrificing coverage.

Evaluation factors:

- Changes in coverage
- Cost savings

Field Study Implementation

- Subsampled 200 NSDUH segments
- Matched SDUs to ABS Frame to estimate actual coverage
- Used field staff to aid matching

$$\textbf{Actual Segment Coverage} = \frac{\textbf{Matched SDUs}}{\textbf{Total SDUs}}$$

Predicted Segment Coverage

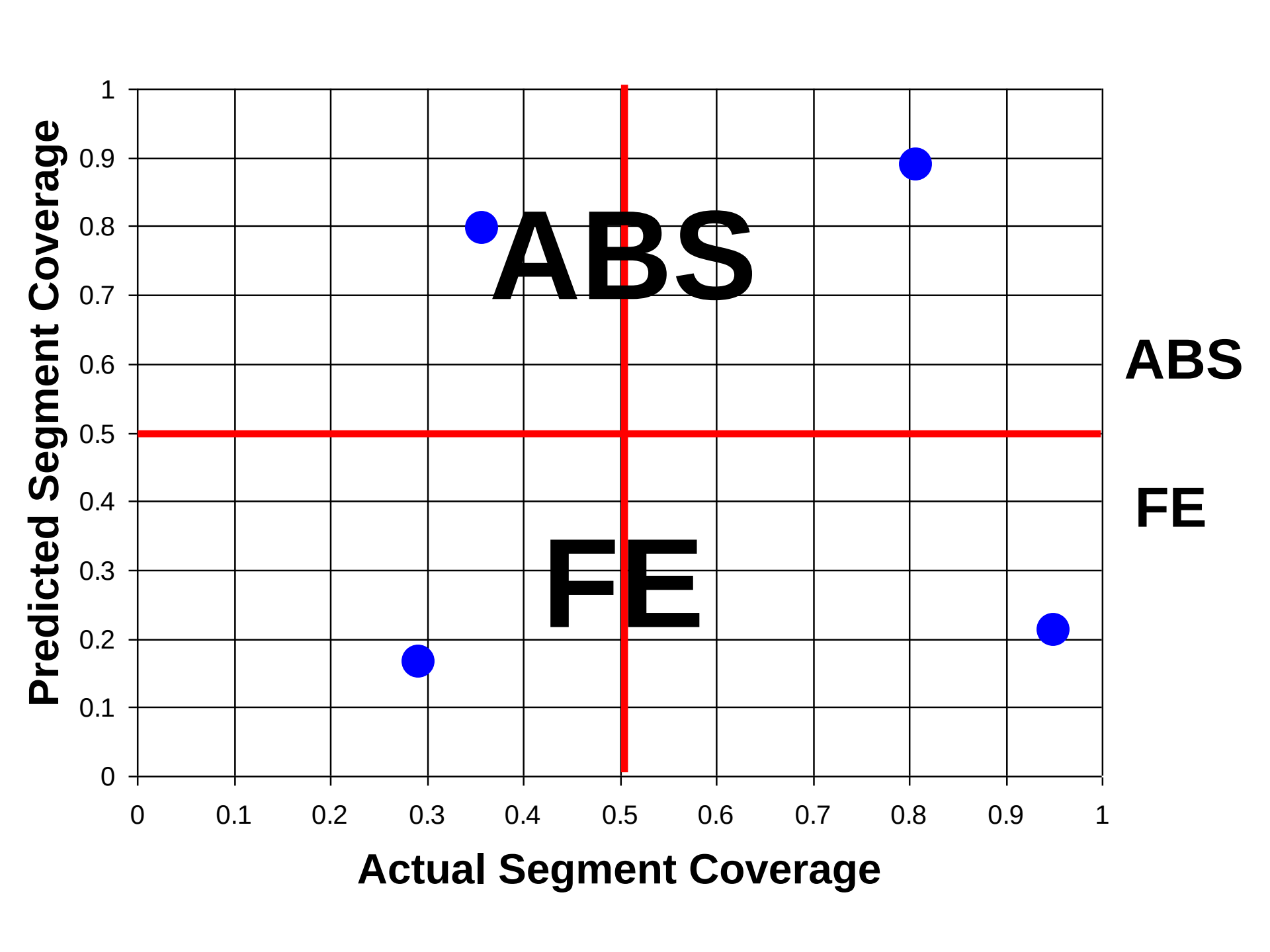
$$\text{Predicted Segment Coverage} = \frac{\#\ \text{Locatable Addresses}}{(\#\ \text{HH} + \#\ \text{GQ})}$$

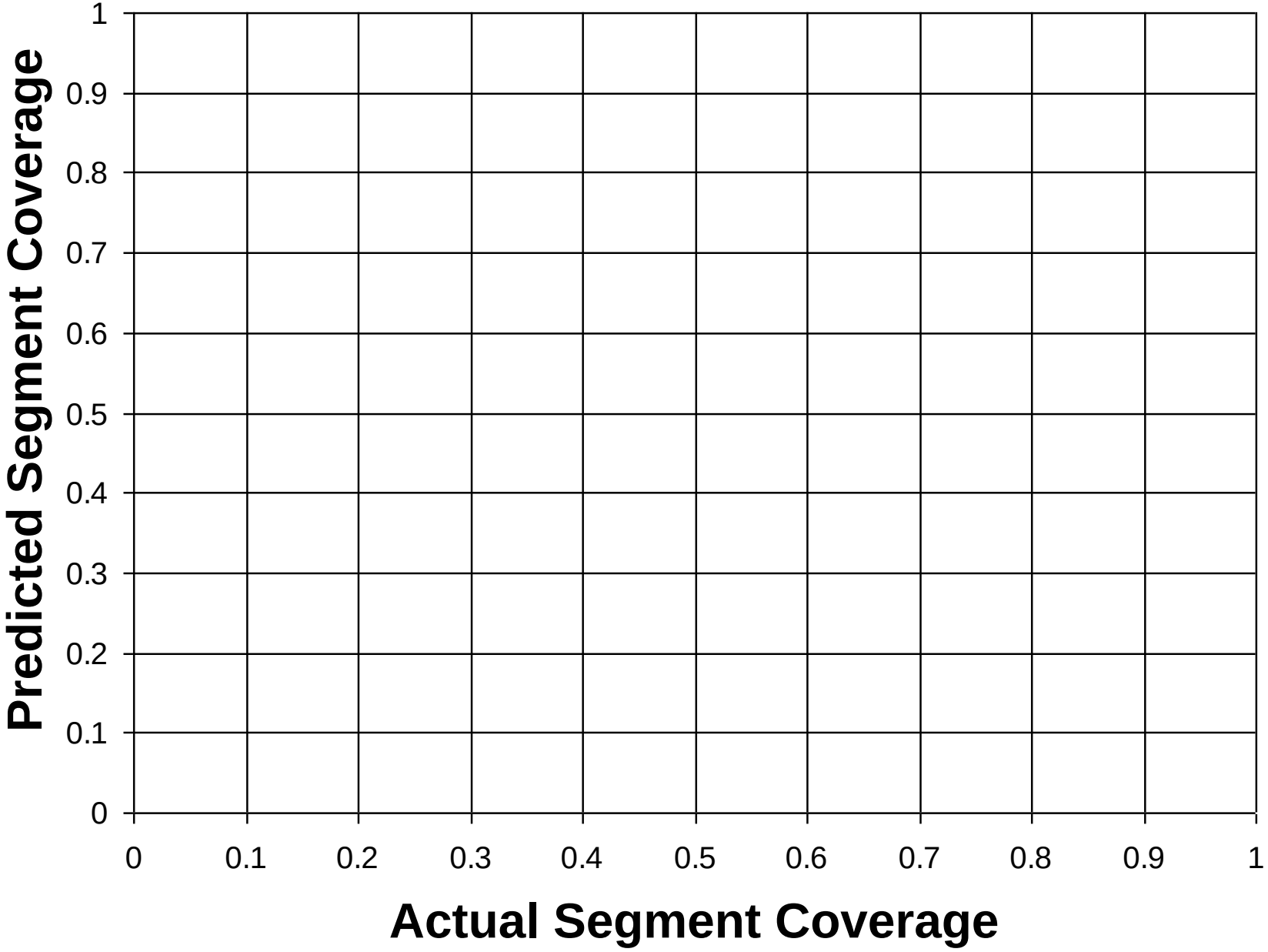
Sources of Inaccurate Predictions

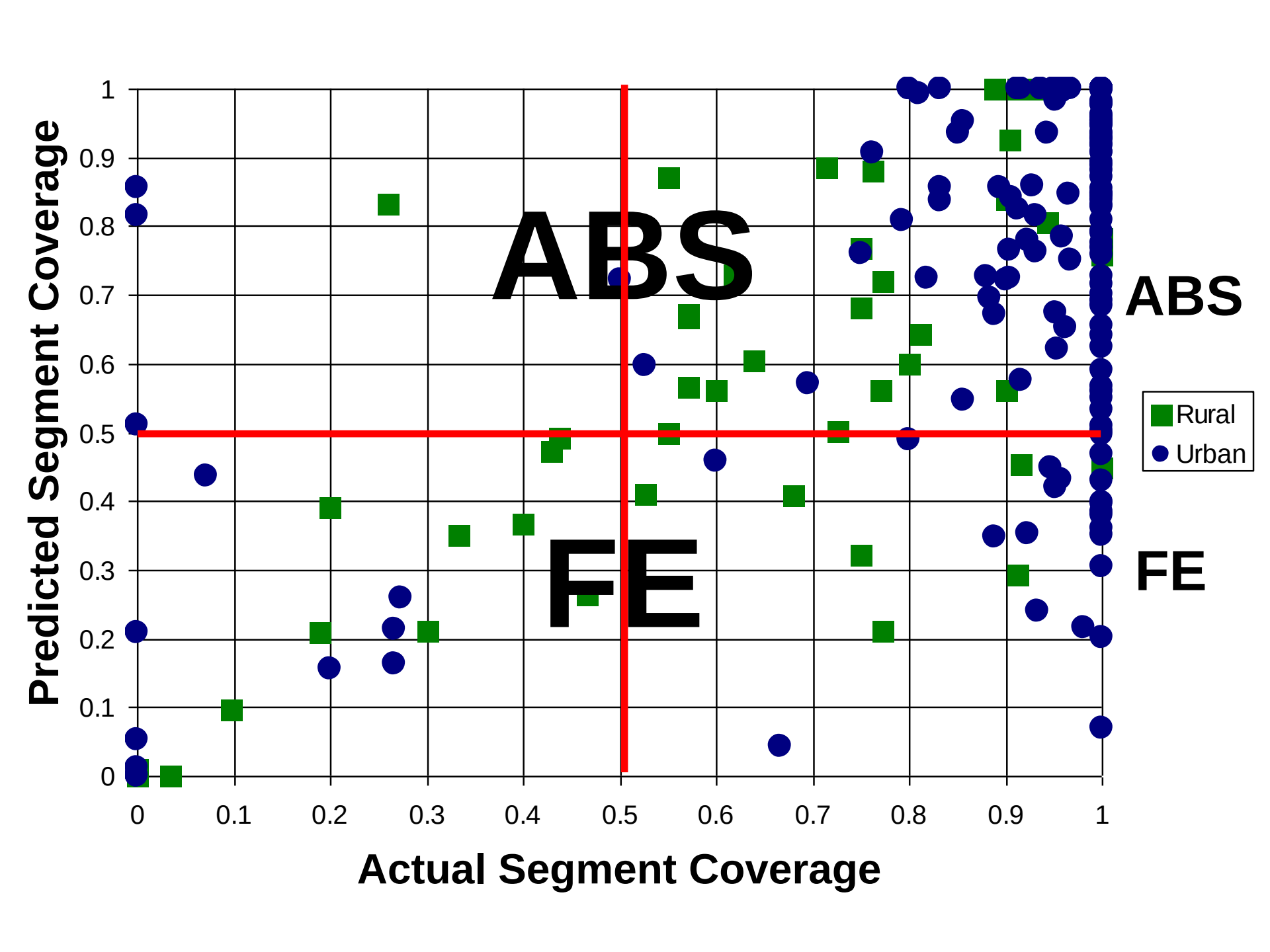
- # Locatable Adds
  - Geocoding error
- #HHs + #GQs
  - Estimates out of date
  - High growth/High decline areas

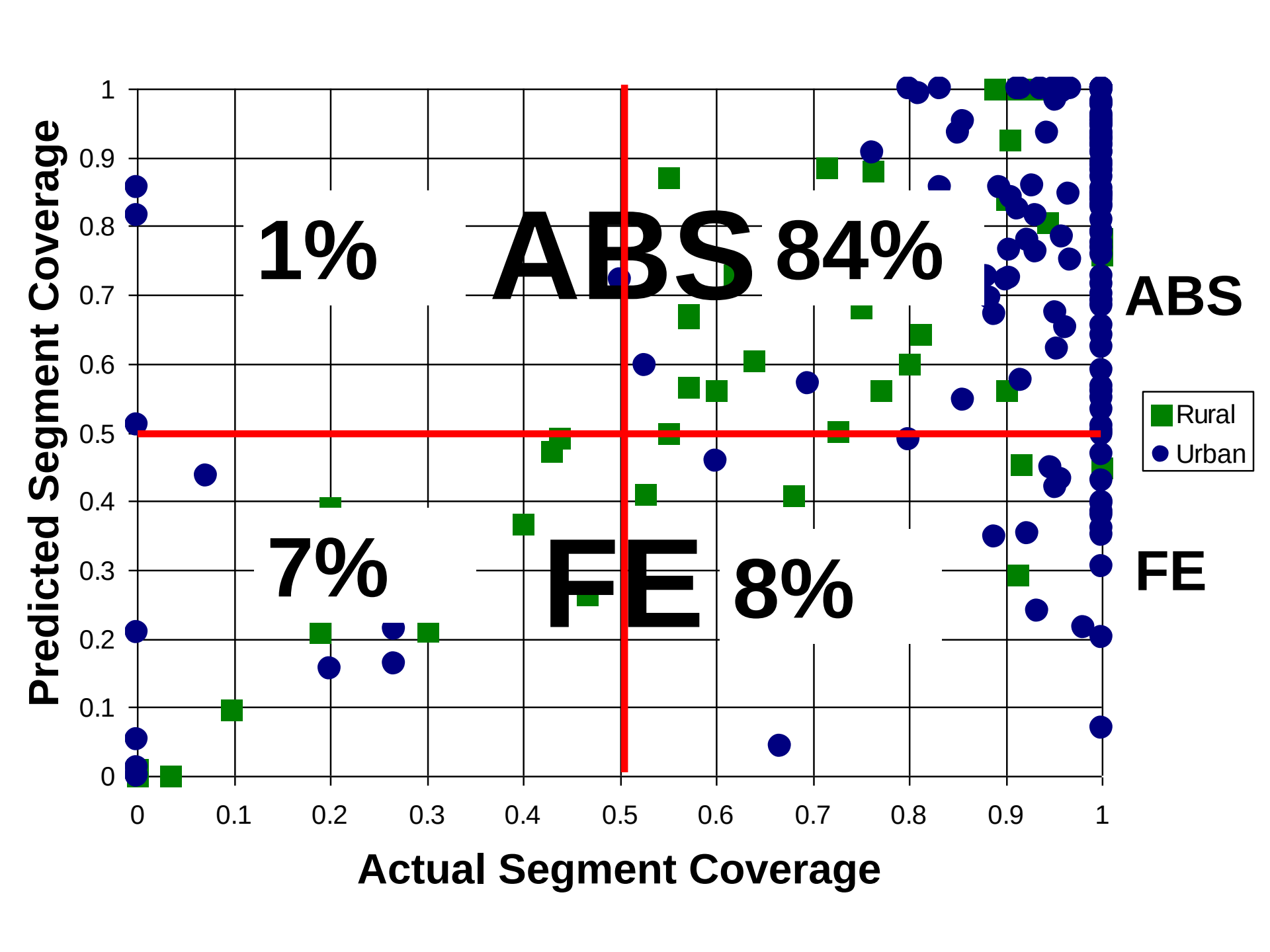
Implications of Inaccurate Predictions

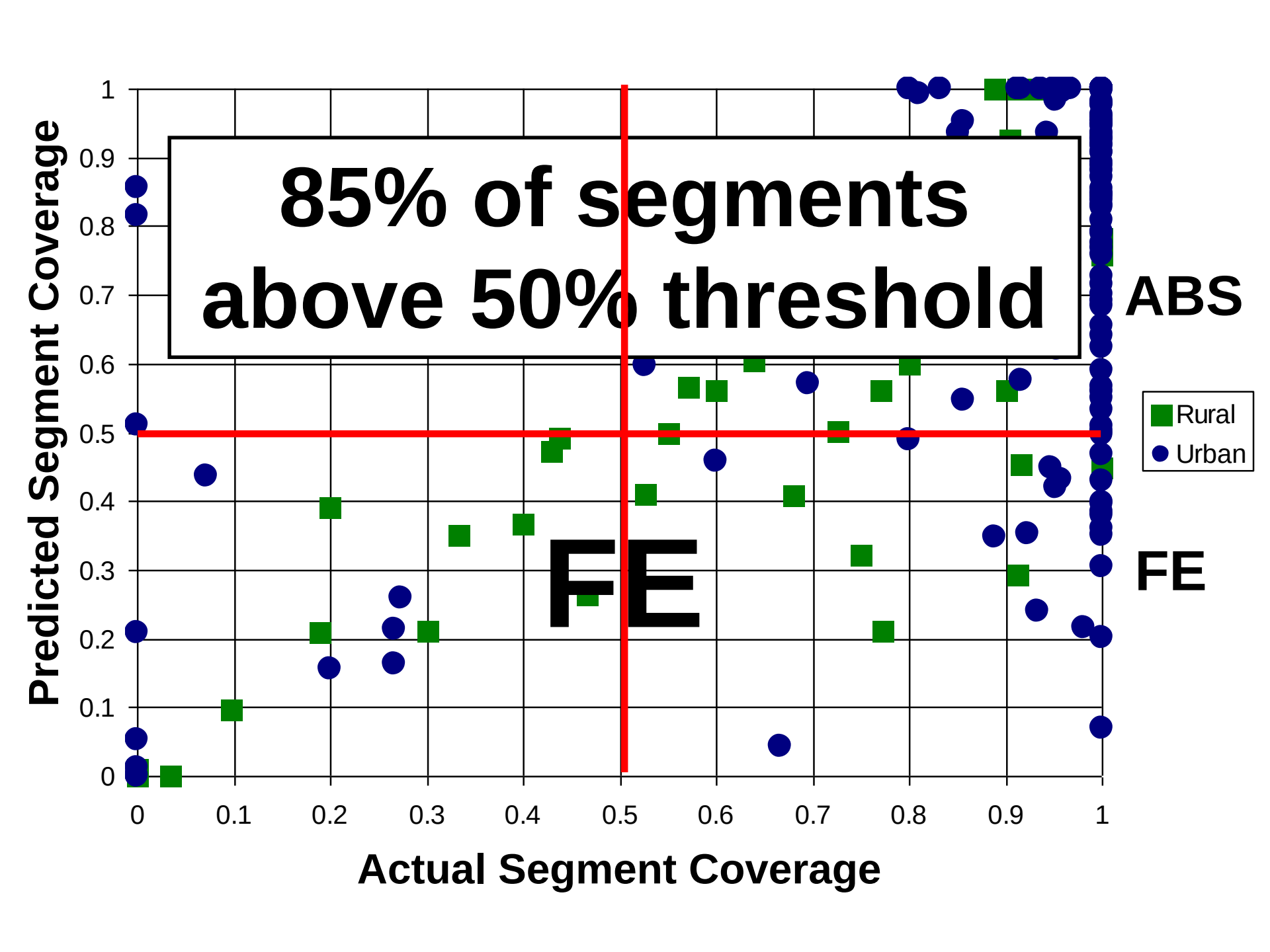
- Using ABS when should use FE
  - Loss in coverage
  - Unnecessarily increases costs
- Using FE when should use ABS
  - Unnecessarily increases costs

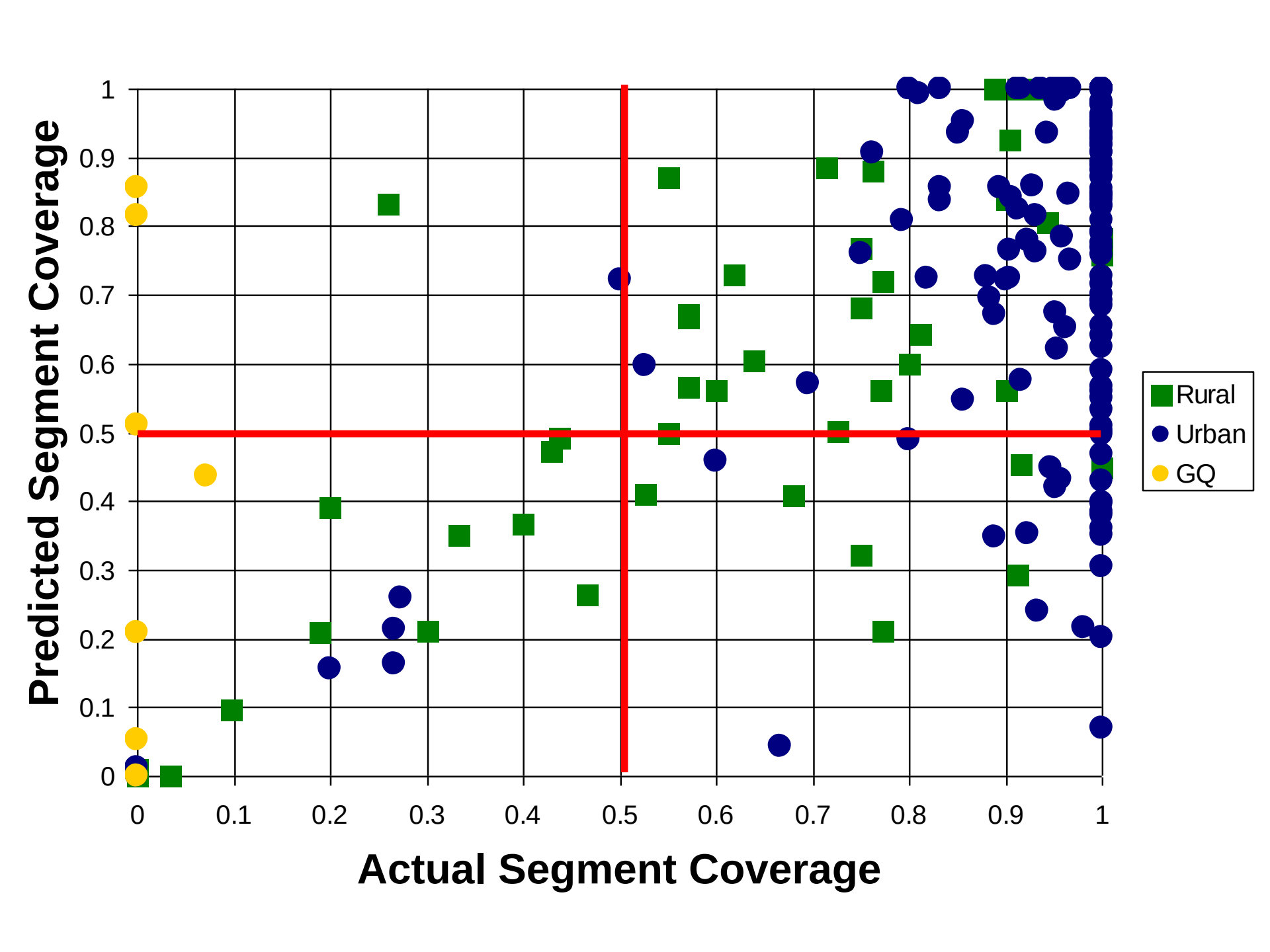

ABS
FE
Predicted Segment Coverage
Actual Segment Coverage
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ABS
FE


Predicted Segment Coverage
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Actual Segment Coverage


ABS
FE
ABS
FE
Rural
Urban
Predicted Segment Coverage
Actual Segment Coverage
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Predicted Segment Coverage
Actual Segment Coverage
1%
ABS
84%
7%
FE
8%
ABS
FE
Rural
Urban
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


85% of segments above 50% threshold
FE
ABS
FE
Rural
Urban
Predicted Segment Coverage
Actual Segment Coverage
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Predicted Segment Coverage
Actual Segment Coverage
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Rural
Urban
GQ

Conclusions

Improving coverage prediction will:

- Further decrease costs
  - ABS where appropriate
  - Reduce field burden
- Increase coverage
  - FE where appropriate
  - Reduce field burden

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