FoodAPS: Alternative Data Collection Methods
Is "Proof of Purchase" Really Proof?

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Background

The USDA's first National Household Food Acquisition and Purchase Survey (FoodAPS-1) was a nationally representative survey that collected data about household food purchases and acquisitions.

A subsequent Alternative Data Collection Method (ADCM) study was conducted to test the feasibility of using a web-based app to collect data. The app included the ability to upload images of receipts.

The ADCM aimed to investigate the likelihood respondents would provide images of receipts and to what end that data could be leveraged to reduce the overall reporting burden and improve data quality.

Future data collection will employ technology with an encompassing focus towards increasing report frequency and accuracy through immediacy and reduced respondent burden.

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Purchases & Acquisitions

The ADCM data included a total of 4,906 food-events, classified as two types:

- Food Away from Home (FAFH)
- Food at Home (FAH)

Participants were asked to report event details including:

- Who paid for the event and how was payment made
- Who ate at the event (Food Away from Home (FAFH) events only)
- Where the event occurred
- How many items were purchased, their prices, and the total cost
- Is a receipt available for upload

A validation of the ADCM data was conducted using the receipts to validate:

- Total cost
- Item quantity
- Prices reported

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Receipt Paradata and Data Quality

1,598 ADCM events were reported as "having a receipt to upload".

The validation effort included a random sample of 100 FAFH & 100 FAH events.

Within both samples, there were instances of missing images, images that were not receipts, and images of non-itemized receipts.
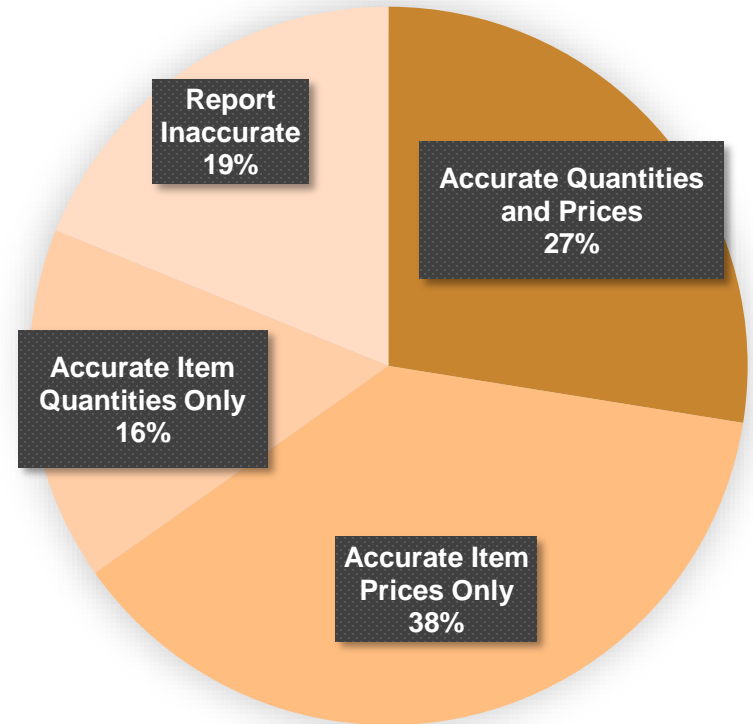
FAFH Validation Findings

In total, 69 of the 100 events were validated by an itemized receipt.

- 27% had both accurate prices **and** quantities.

- Errant reports accounted for 19%

- 54% of events maintained accurate prices **or** accurate quantities.

FAFH Reciept Events

Report Inaccurate 19%

Accurate Quantities and Prices 27%

Accurate Item Quantities Only 16%

Accurate Item Prices Only 38%

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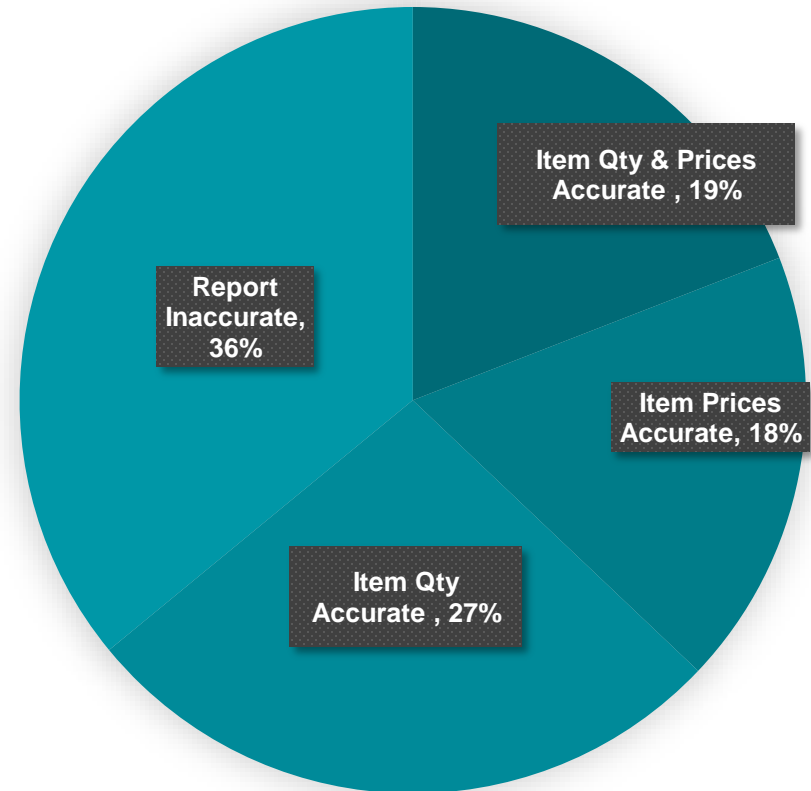UNIVERSITY OF MICHIGAN

FAH Validation Findings

89 of 100 sampled FAH events had legible and itemized receipts.

- 19% had both accurate prices **and** quantities.

- Errant reports accounted for 36%

- 45% of events maintained accurate prices **or** accurate quantities.

FAH Receipt Events

Item Qty & Prices Accurate , 19%

Report Inaccurate, 36%

Item Prices Accurate, 18%

Item Qty Accurate , 27%

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Additional Findings

Validation showed that numerous issues impact the viability of consistently using receipts as an indicator of data quality.
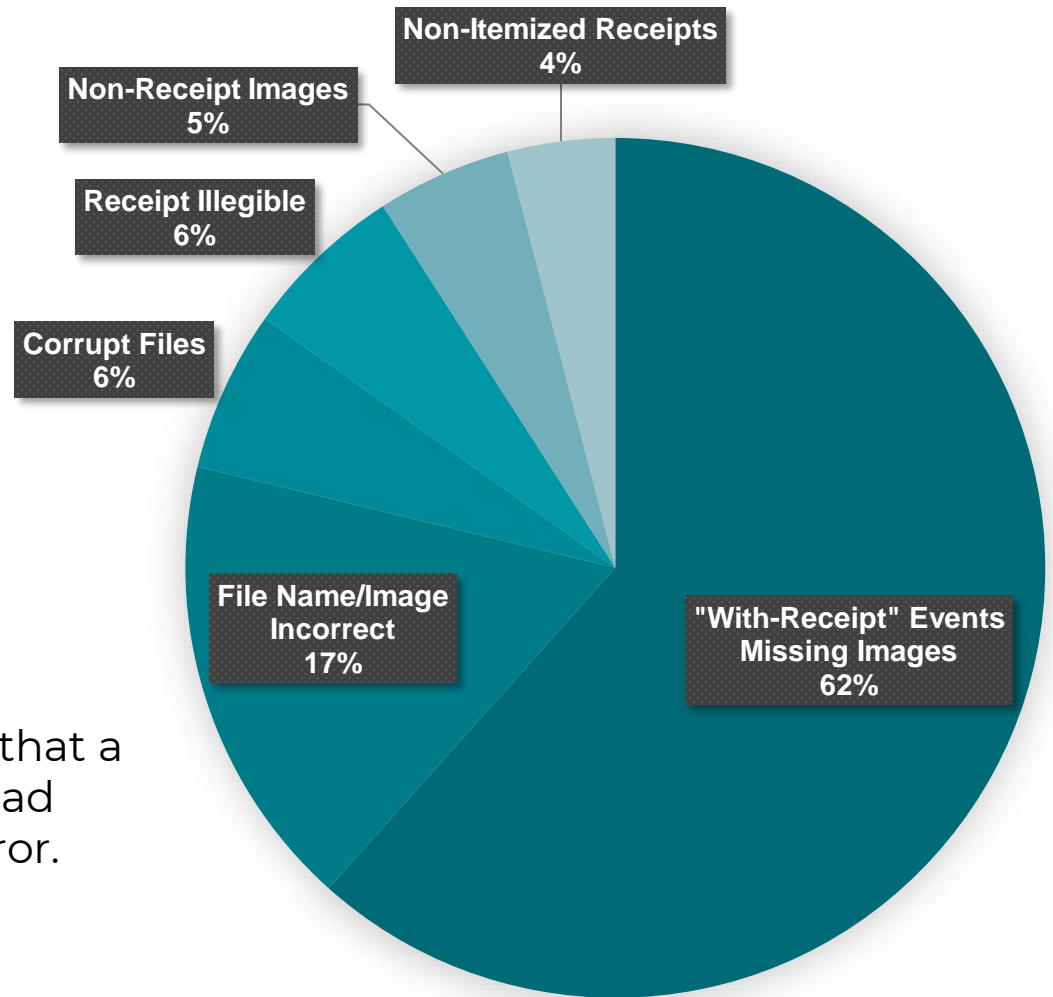
❑ Classification of "receipt" by Rs

❑ Misclassification of event type

❑ Receipt & image composition

- Non-itemized receipts
- No standard for capturing content

❑ Receipts reported by Rs suffered attrition due to:

- Image missing
- Receipt was not itemized
- Receipt image did not match reported location
- Image was not a receipt
- File was corrupt
- Receipt image was illegible

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Receipt Quality Errors – FAFH
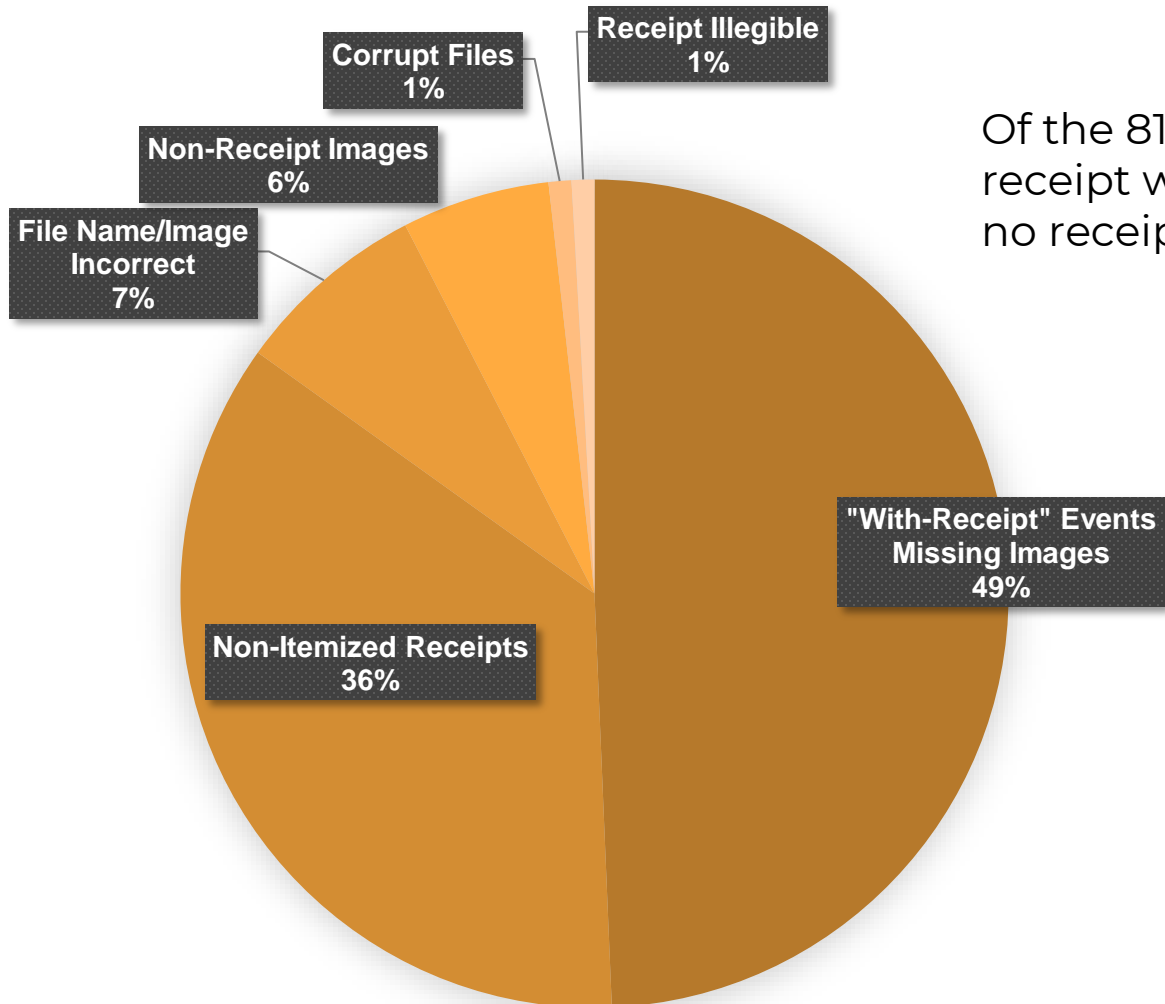
Of the 815 FAFH events reporting that a receipt was available, 225 (27.6%) had no receipt available due some error.

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Receipt Quality Errors - FAH

Non-Itemized Receipts
4%

Non-Receipt Images
5%

Receipt Illegible
6%

Corrupt Files
6%

File Name/Image Incorrect
17%

"With-Receipt" Events Missing Images
62%

Of the 783 FAH events reporting that a receipt was available, 99 (12.6%) had no receipt available due some error.

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Receipt Images Compared to Events

Receipt Outcomes by Event Type
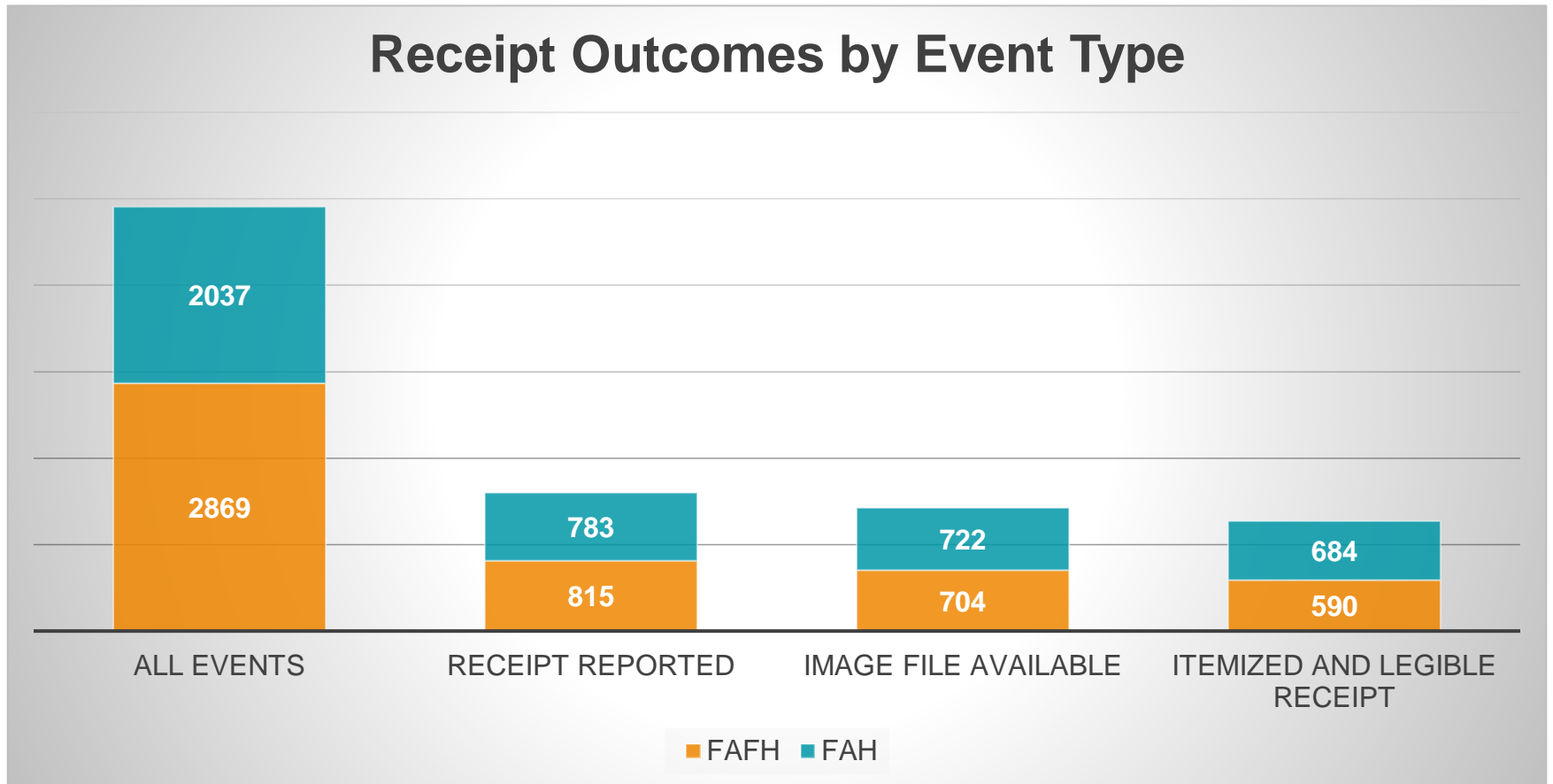
Expectation of Receipt

Receipt Expected group (3,112 events):

Grocery stores, restaurants/bars, convenience stores, club stores, and superstores/big box stores.

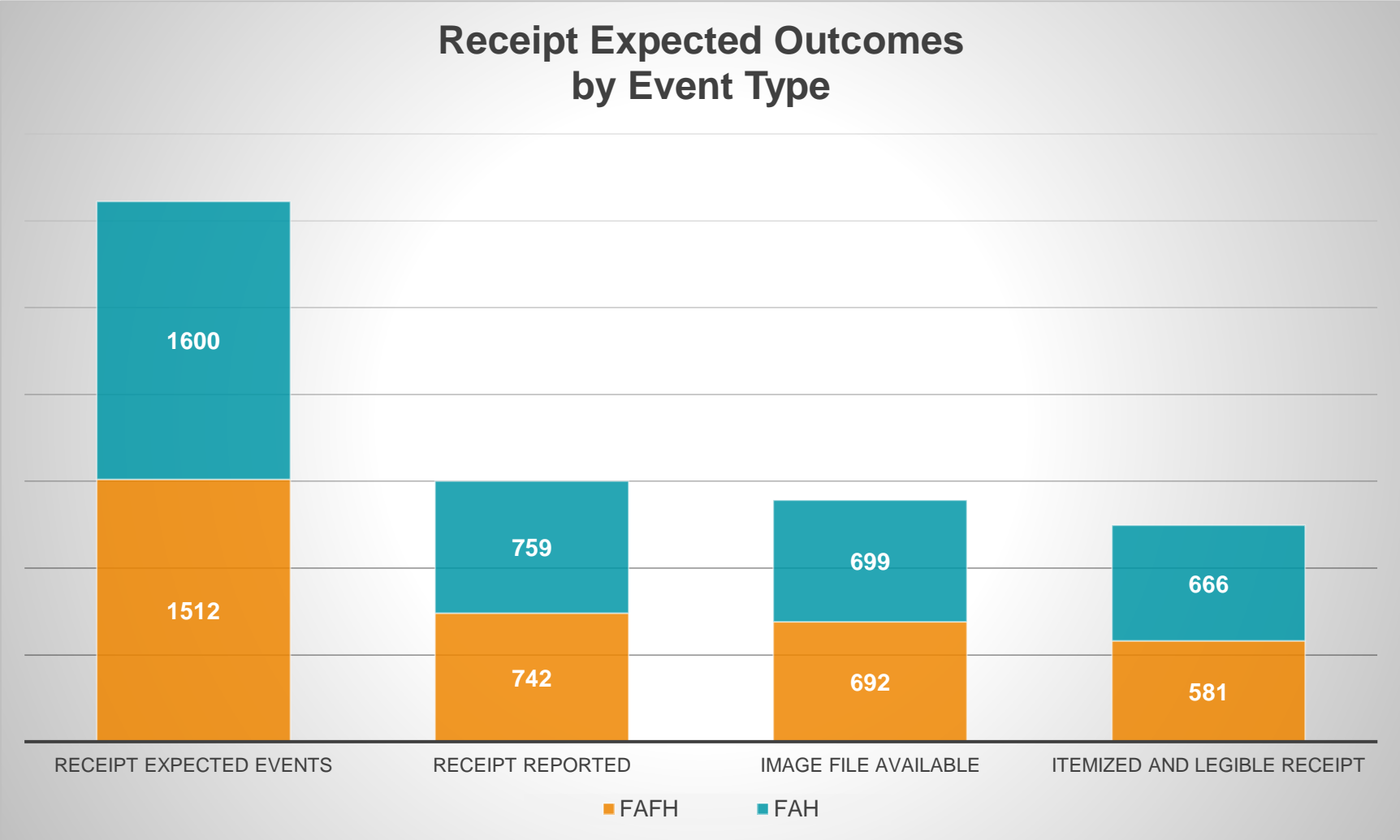No Receipt Expected group (1,457 events):

School meals (including before and after school care), work, vending machines, and friend's or family's place.

Receipt Possible (336 events):

Farmers markets, food pantries, soup kitchens and locales defined as "other".

One of the 4,906 events was missing data on its location.

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Summary of Receipt Expected Events

Receipt Expected Outcomes by Event Type

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Key Takeaways

Receipt availability and consistency higher for FAH events.

Reporting accuracy decreases with event complexity; e.g. number of items and corresponding prices.

Event totals and tax tended to be reported more accurately than item totals and item prices.

Non-receipt images are a small source of error.

Non-itemized receipts are commonly employed by specific types of establishments; e.g., pizza delivery.

Excluding non-itemized receipts, most FAFH conflicts arose where more food items were listed on the receipt than in the ADCM data.

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Next Steps?

Prediction – Identify key indicators of receipt submission as well as indicators of impaired data quality.

Intervention – Formulate protocols for data collection that motivate improved data quality and reporting outcomes.

Improvement – Create clear classifications and examples for respondents to better communicate expectations related to event classification and reporting.

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Thank you!

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