Organic Food Environment Assessment

Alexandra Sadler

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## Descriptive Results

|  | Total vendors | Higher | Middle | Lower | Mobile vendor | Stationary small vendor | Supermarket |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Brazil | | | | | | | |
| Rio de Janeiro | 60 | 14 (23%) | 18 (30%) | 28 (47%) | 1 (2%) | 42 (70%) | 17 (28%) |
| Sao Paolo | 58 | 4 (7%) | 41 (71%) | 13 (22%) | 0 (0%) | 50 (86%) | 8 (14%) |
| Sinop | 8 | 2 (25%) | 2 (25%) | 4 (50%) | 0 (0%) | 1 (12%) | 7 (88%) |
| total | 126 | 20 | 61 | 45 | 1 | 93 | 32 |
| India | | | | | | | |
| Hyderabad | 141 | 25 (18%) | 22 (16%) | 94 (67%) | 15 (11%) | 120 (85%) | 6 (4%) |
| Latur | 120 | 16 (13%) | 30 (25%) | 74 (62%) | 11 (9%) | 108 (90%) | 1 (1%) |
| Visakhapatnam | 226 | 103 (46%) | 54 (24%) | 69 (31%) | 30 (13%) | 176 (78%) | 20 (9%) |
| total | 487 | 144 | 106 | 237 | 56 | 404 | 27 |
| UK | | | | | | | |
| Birmingham | 43 | 11 (26%) | 19 (44%) | 13 (30%) | 0 (0%) | 29 (67%) | 14 (33%) |
| Edinburgh | 60 | 15 (25%) | 29 (48%) | 16 (27%) | 0 (0%) | 45 (75%) | 15 (25%) |
| London | 92 | 49 (53%) | 30 (33%) | 13 (14%) | 6 (7%) | 69 (75%) | 17 (18%) |
| total | 195 | 75 | 78 | 42 | 6 | 143 | 46 |

## 1. What is the availability of organic food in urban food environments? How does this vary across different geographic and socioeconomic contexts?

### Hypothesis 1a. Organic food availability will be highest in the United Kingdom, in larger cities within a given country, and in higher-income neighbourhoods within a given city.

#### Kruskal-Wallis rank sum test

##### Overall results (variation between countries)

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by country  
## Kruskal-Wallis chi-squared = 68.508, df = 2, p-value = 1.33e-15

##### Country-level results (variation between cities within a given country)

###### Brazil

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by city  
## Kruskal-Wallis chi-squared = 12.502, df = 2, p-value = 0.001929

###### India

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by city  
## Kruskal-Wallis chi-squared = 40.193, df = 2, p-value = 1.871e-09

###### United Kingdom

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by city  
## Kruskal-Wallis chi-squared = 9.4285, df = 2, p-value = 0.008967

##### City-level results (variation between neighbourhoods within a given city)

###### Brazil: Rio de Janeiro

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 22.799, df = 2, p-value = 1.12e-05

###### Brazil: Sao Paulo

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 13.583, df = 2, p-value = 0.001123

###### Brazil: Sinop

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 2.3571, df = 2, p-value = 0.3077

###### India: Hyderabad

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 18.695, df = 2, p-value = 8.717e-05

###### India: Latur

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 2.5505, df = 2, p-value = 0.2794

###### India: Visakhapatnam

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 11.376, df = 2, p-value = 0.003386

###### United Kingdom: Birmingham

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 5.7698, df = 2, p-value = 0.05586

###### UK: Edinburgh

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 0.38618, df = 2, p-value = 0.8244

###### UK: London

##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 9.8872, df = 2, p-value = 0.007129

##### Summary of p-values

###### Overall p-value

## [1] 1.329504e-15

###### Country-level p-values

## $result\_brazil  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by city  
## Kruskal-Wallis chi-squared = 12.502, df = 2, p-value = 0.001929  
##   
##   
## $result\_india  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by city  
## Kruskal-Wallis chi-squared = 40.193, df = 2, p-value = 1.871e-09  
##   
##   
## $result\_uk  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by city  
## Kruskal-Wallis chi-squared = 9.4285, df = 2, p-value = 0.008967

## Country PValue  
## result\_brazil Brazil 1.928758e-03  
## result\_india India 1.871223e-09  
## result\_uk UK 8.966766e-03

###### City-level p-values

## $result\_rio  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 22.799, df = 2, p-value = 1.12e-05  
##   
##   
## $result\_saopaulo  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 13.583, df = 2, p-value = 0.001123  
##   
##   
## $result\_sinop  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 2.3571, df = 2, p-value = 0.3077  
##   
##   
## $result\_hyderabad  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 18.695, df = 2, p-value = 8.717e-05  
##   
##   
## $result\_latur  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 2.5505, df = 2, p-value = 0.2794  
##   
##   
## $result\_visakhapatnam  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 11.376, df = 2, p-value = 0.003386  
##   
##   
## $result\_birmingham  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 5.7698, df = 2, p-value = 0.05586  
##   
##   
## $result\_edinburgh  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 0.38618, df = 2, p-value = 0.8244  
##   
##   
## $result\_london  
##   
## Kruskal-Wallis rank sum test  
##   
## data: org\_foods\_count by circle  
## Kruskal-Wallis chi-squared = 9.8872, df = 2, p-value = 0.007129

## City PValue  
## result\_rio Rio de Janeiro 1.120079e-05  
## result\_saopaulo Sao Paolo 1.123209e-03  
## result\_sinop Sinop 3.077180e-01  
## result\_hyderabad Hyderabad 8.716660e-05  
## result\_latur Latur 2.793594e-01  
## result\_visakhapatnam Visakhapatnam 3.385817e-03  
## result\_birmingham Birmingham 5.586110e-02  
## result\_edinburgh Edinburgh 8.244084e-01  
## result\_london London 7.128739e-03

#### Chi-squared test

##### Overall results (variation between countries)

## 0 1  
## Brazil 100 26  
## India 332 155  
## UK 80 115

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 60.666, df = 2, p-value = 6.708e-14

##### Country-level results (variation between cities within a given country)

###### Brazil

## 0 1  
## Rio de Janeiro 40 20  
## Sao Paolo 54 4  
## Sinop 6 2

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 12.685, df = 2, p-value = 0.00176

###### India

## 0 1  
## Hyderabad 110 31  
## Latur 49 71  
## Visakhapatnam 173 53

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 54.939, df = 2, p-value = 1.175e-12

###### United Kingdom

## 0 1  
## Birmingham 26 17  
## Edinburgh 28 32  
## London 26 66

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 13.701, df = 2, p-value = 0.001059

##### Neighbourhood-level results (variation between neighbourhoods within a given city)

###### Brazil: Rio de Janeiro

## 0 1  
## Higher 3 11  
## Lower 24 4  
## Middle 13 5

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 17.714, df = 2, p-value = 0.0001424

###### Brazil: Sao Paulo

## 0 1  
## Higher 2 2  
## Lower 12 1  
## Middle 40 1

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 12.856, df = 2, p-value = 0.001616

###### Brazil: Sinop

## 0 1  
## Higher 1 1  
## Lower 4 0  
## Middle 1 1

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 2.6667, df = 2, p-value = 0.2636

###### India: Hyderabad

## 0 1  
## Higher 16 9  
## Lower 83 11  
## Middle 11 11

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 18.724, df = 2, p-value = 8.591e-05

###### India: Latur

## 0 1  
## Higher 7 9  
## Lower 33 41  
## Middle 9 21

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 1.947, df = 2, p-value = 0.3778

###### India: Visakhapatnam

## 0 1  
## Higher 84 19  
## Lower 57 12  
## Middle 32 22

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 11.841, df = 2, p-value = 0.002685

###### United Kingdom: Birmingham

## 0 1  
## Higher 5 6  
## Lower 11 2  
## Middle 10 9

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 4.6963, df = 2, p-value = 0.09554

###### United Kingdom: Edinburgh

## 0 1  
## Higher 8 7  
## Lower 8 8  
## Middle 12 17

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 0.66502, df = 2, p-value = 0.7171

###### United Kingdom: London

## 0 1  
## Higher 17 32  
## Lower 0 13  
## Middle 9 21

##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 6.1662, df = 2, p-value = 0.04582

##### Summary of p-values

###### Overall p-value

## [1] 6.707989e-14

###### Country-level p-values

## $chi\_result\_brazil  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 12.685, df = 2, p-value = 0.00176  
##   
##   
## $chi\_result\_india  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 54.939, df = 2, p-value = 1.175e-12  
##   
##   
## $chi\_result\_uk  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 13.701, df = 2, p-value = 0.001059

## Country PValue  
## chi\_result\_brazil Brazil 1.759699e-03  
## chi\_result\_india India 1.175184e-12  
## chi\_result\_uk UK 1.058911e-03

###### City-level p-values

## $chi\_result\_rio  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 17.714, df = 2, p-value = 0.0001424  
##   
##   
## $chi\_result\_saopaulo  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 12.856, df = 2, p-value = 0.001616  
##   
##   
## $chi\_result\_sinop  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 2.6667, df = 2, p-value = 0.2636  
##   
##   
## $chi\_result\_hyderabad  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 18.724, df = 2, p-value = 8.591e-05  
##   
##   
## $chi\_result\_latur  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 1.947, df = 2, p-value = 0.3778  
##   
##   
## $chi\_result\_visakhapatnam  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 11.841, df = 2, p-value = 0.002685  
##   
##   
## $chi\_result\_birmingham  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 4.6963, df = 2, p-value = 0.09554  
##   
##   
## $chi\_result\_edinburgh  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 0.66502, df = 2, p-value = 0.7171  
##   
##   
## $chi\_result\_london  
##   
## Pearson's Chi-squared test  
##   
## data: data\_matrix  
## X-squared = 6.1662, df = 2, p-value = 0.04582

## City PValue  
## chi\_result\_rio Rio de Janeiro 1.423612e-04  
## chi\_result\_saopaulo Sao Paolo 1.615971e-03  
## chi\_result\_sinop Sinop 2.635971e-01  
## chi\_result\_hyderabad Hyderabad 8.590791e-05  
## chi\_result\_latur Latur 3.777640e-01  
## chi\_result\_visakhapatnam Visakhapatnam 2.684517e-03  
## chi\_result\_birmingham Birmingham 9.554466e-02  
## chi\_result\_edinburgh Edinburgh 7.171198e-01  
## chi\_result\_london London 4.581797e-02

#### Summary statistics

##### For each neighbourhood within each city

|  | Total vendors | Organic vendors, n(%) | Organic sentinel foods, median (IQR) |
| --- | --- | --- | --- |
| Brazil - Rio de Janeiro | | | |
| Higher | 14 | 11 (79%) | 4.0 (4.75) |
| Middle | 18 | 5 (28%) | 0.0 (0.75) |
| Lower | 28 | 4 (14%) | 0.0 (0.00) |
| total | 60 | 20 | 4 |
| Brazil - Sao Paolo | | | |
| Higher | 4 | 2 (50%) | 1.0 (4.50) |
| Middle | 41 | 1 (2%) | 0.0 (0.00) |
| Lower | 13 | 1 (8%) | 0.0 (0.00) |
| total | 58 | 4 | 1 |
| Brazil - Sinop | | | |
| Higher | 2 | 1 (50%) | 3.0 (3.00) |
| Middle | 2 | 1 (50%) | 1.0 (1.00) |
| Lower | 4 | 0 (0%) | 0.0 (0.00) |
| total | 8 | 2 | 4 |
| India - Hyderabad | | | |
| Higher | 25 | 9 (36%) | 0.0 (1.00) |
| Middle | 22 | 11 (50%) | 0.5 (1.00) |
| Lower | 94 | 11 (12%) | 0.0 (0.00) |
| total | 141 | 31 | 0 |
| India - Latur | | | |
| Higher | 16 | 9 (56%) | 1.0 (1.00) |
| Middle | 30 | 21 (70%) | 1.0 (1.00) |
| Lower | 74 | 41 (55%) | 1.0 (1.00) |
| total | 120 | 71 | 3 |
| India - Visakhapatnam | | | |
| Higher | 103 | 19 (18%) | 0.0 (0.00) |
| Middle | 54 | 22 (41%) | 0.0 (1.00) |
| Lower | 69 | 12 (17%) | 0.0 (0.00) |
| total | 226 | 53 | 0 |
| UK - Birmingham | | | |
| Higher | 11 | 6 (55%) | 1.0 (3.00) |
| Middle | 19 | 9 (47%) | 0.0 (2.00) |
| Lower | 13 | 2 (15%) | 0.0 (0.00) |
| total | 43 | 17 | 1 |
| UK - Edinburgh | | | |
| Higher | 15 | 7 (47%) | 0.0 (2.00) |
| Middle | 29 | 17 (59%) | 1.0 (3.00) |
| Lower | 16 | 8 (50%) | 0.5 (2.00) |
| total | 60 | 32 | 2 |
| UK - London | | | |
| Higher | 49 | 32 (65%) | 1.0 (2.00) |
| Middle | 30 | 21 (70%) | 1.0 (1.00) |
| Lower | 13 | 13 (100%) | 3.0 (6.00) |
| total | 92 | 66 | 5 |

##### For each city within each country

##### For each country

## # A tibble: 3 × 3  
## country median\_org\_foods\_count iqr\_org\_foods\_count  
## <chr> <dbl> <dbl>  
## 1 Brazil 0 0  
## 2 India 0 1  
## 3 UK 1 2

##### Overall

## [1] 0

## [1] 1

### Exploratory Analysis: Hypothesis 1b. The count and proportion of vendors selling multiple organic options for at least one sentinel food will be highest in the United Kingdom, in larger cities within a given country, and in higher-income neighbourhoods within a given city.

#### Median and interquartile range

##### For each neighbourhood within each city

## # A tibble: 27 × 5  
## country city circle median\_multiple\_org\_co…¹ iqr\_multiple\_org\_count  
## <chr> <chr> <fct> <dbl> <dbl>  
## 1 Brazil Rio de Janeiro Higher 1 3.5   
## 2 Brazil Rio de Janeiro Middle 0 0   
## 3 Brazil Rio de Janeiro Lower 0 0   
## 4 Brazil Sao Paolo Higher 1 3.75  
## 5 Brazil Sao Paolo Middle 0 0   
## 6 Brazil Sao Paolo Lower 0 0   
## 7 Brazil Sinop Higher 2 2   
## 8 Brazil Sinop Middle 0.5 0.5   
## 9 Brazil Sinop Lower 0 0   
## 10 India Hyderabad Higher 0 0   
## # ℹ 17 more rows  
## # ℹ abbreviated name: ¹​median\_multiple\_org\_count

##### For each city within each country

## # A tibble: 9 × 4  
## country city median\_multiple\_org\_count iqr\_multiple\_org\_count  
## <chr> <chr> <dbl> <dbl>  
## 1 Brazil Rio de Janeiro 0 1   
## 2 Brazil Sao Paolo 0 0   
## 3 Brazil Sinop 0 0.25  
## 4 India Hyderabad 0 0   
## 5 India Latur 0 0   
## 6 India Visakhapatnam 0 0   
## 7 UK Birmingham 0 0   
## 8 UK Edinburgh 0 1   
## 9 UK London 1 1

##### For each country

## # A tibble: 3 × 3  
## country median\_multiple\_org\_count iqr\_multiple\_org\_count  
## <chr> <dbl> <dbl>  
## 1 Brazil 0 0  
## 2 India 0 0  
## 3 UK 0 1

##### Overall

## [1] 0

## [1] 0

### Exploratory Analysis: Organic versus non-organic vendor characteristics

#### Country-level

## # A tibble: 6 × 14  
## country org\_vendor median\_vendor\_cashiers iqr\_vendor\_cashiers  
## <chr> <dbl> <dbl> <dbl>  
## 1 Brazil 0 1 1   
## 2 Brazil 1 3 11   
## 3 India 0 1 0   
## 4 India 1 1 0   
## 5 UK 0 1 0   
## 6 UK 1 1 2.5  
## # ℹ 10 more variables: min\_vendor\_cashiers <dbl>, max\_vendor\_cashiers <dbl>,  
## # median\_days\_open\_count <dbl>, iqr\_days\_open\_count <dbl>,  
## # min\_days\_open\_count <dbl>, max\_days\_open\_count <dbl>,  
## # median\_foods\_count <dbl>, iqr\_foods\_count <dbl>, min\_foods\_count <dbl>,  
## # max\_foods\_count <dbl>

#### Overall

## # A tibble: 2 × 13  
## org\_vendor median\_vendor\_cashiers iqr\_vendor\_cashiers min\_vendor\_cashiers  
## <dbl> <dbl> <dbl> <dbl>  
## 1 0 1 0 1  
## 2 1 1 1 1  
## # ℹ 9 more variables: max\_vendor\_cashiers <dbl>, median\_days\_open\_count <dbl>,  
## # iqr\_days\_open\_count <dbl>, min\_days\_open\_count <dbl>,  
## # max\_days\_open\_count <dbl>, median\_foods\_count <dbl>, iqr\_foods\_count <dbl>,  
## # min\_foods\_count <dbl>, max\_foods\_count <dbl>

## 2. How affordable is a sentinel organic food (rice) compared to a non-organic sentinel food (rice) in urban food environments? How does this vary across different geographic contexts?

### Hypothesis 2a. The price of organic rice will be significantly higher than the price of non-organic rice overall and at the country level.

#### Wilcoxon Rank-Sum Test / Mann-Whitney U test

##### Overall results

##   
## Wilcoxon rank sum test with continuity correction  
##   
## data: price by type  
## W = 15310, p-value = 4.432e-12  
## alternative hypothesis: true location shift is greater than 0

## Overall Mann-Whitney U test p-value (one-tailed): 2.215894e-12

##### Country-level results: Brazil

##   
## Wilcoxon rank sum test with continuity correction  
##   
## data: price by type  
## W = 1018.5, p-value = 0.0004403  
## alternative hypothesis: true location shift is greater than 0

## Overall Mann-Whitney U test p-value (one-tailed): 0.000220161

##### Country-level results: India

##   
## Wilcoxon rank sum test with continuity correction  
##   
## data: price by type  
## W = 3026, p-value = 1.708e-08  
## alternative hypothesis: true location shift is greater than 0

## Overall Mann-Whitney U test p-value (one-tailed): 8.540138e-09

##### Country-level results: UK

##   
## Wilcoxon rank sum test with continuity correction  
##   
## data: price by type  
## W = 1467, p-value = 1.238e-07  
## alternative hypothesis: true location shift is greater than 0

## Overall Mann-Whitney U test p-value (one-tailed): 6.191321e-08

#### Table 5: City-level summary statistics

|  | Organic sample size (n) | Conventional sample size (n) | Organic median (IQR), min-max (US$) | Conventional median (IQR), min-max (US$) |
| --- | --- | --- | --- | --- |
| Brazil | | | | |
| Rio de Janeiro | 10 | 40 | 2.88 (0.34), 2.11-4.61 | 1.23 (0.32), 0.77-3.55 |
| Sao Paolo | 1 | 32 | 2.83 (0.00), 2.83-2.83 | 1.14 (0.21), 0.36-1.64 |
| Sinop | 6 | 7 | 1.07 (0.02), 1.03-1.18 | 1.07 (0.02), 1.03-1.18 |
| total | 17 | 79 | — | — |
| India | | | | |
| Hyderabad | 2 | 59 | 1.01 (0.29), 0.73-1.30 | 0.69 (0.12), 0.36-1.03 |
| Latur | 0 | 74 | --- (---), Inf--Inf | 0.61 (0.12), 0.24-0.73 |
| Visakhapatnam | 14 | 74 | 1.10 (0.32), 0.61-3.20 | 0.64 (0.17), 0.36-2.69 |
| total | 16 | 207 | — | — |
| UK | | | | |
| Birmingham | 2 | 25 | 5.24 (0.69), 4.54-5.93 | 3.02 (0.74), 0.69-5.68 |
| Edinburgh | 4 | 28 | 4.02 (2.05), 3.46-11.34 | 2.13 (1.00), 0.51-7.37 |
| London | 12 | 39 | 7.03 (4.30), 4.75-11.95 | 3.94 (2.34), 1.64-8.80 |
| total | 18 | 92 | — | — |

#### Table 5: Country-level summary statistics

|  | Country | Organic sample size (n) | Conventional sample size (n) | Organic median (IQR), min-max (US$) | Conventional median (IQR), min-max (US$) |
| --- | --- | --- | --- | --- | --- |
|  | Brazil | 17 | 79 | 2.69 (1.80), 1.03-4.61 | 1.14 (0.30), 0.36-3.55 |
|  | India | 16 | 207 | 1.10 (0.37), 0.61-3.20 | 0.61 (0.18), 0.24-2.69 |
|  | UK | 18 | 92 | 5.75 (4.57), 3.46-11.95 | 2.97 (2.13), 0.51-8.80 |
| total | — | 51 | 378 | — | — |

### Hypothesis 2b. The price of organic rice will be significantly higher than the price of non-organic rice when sold at the same vendor location.

#### Wilcoxon Signed Rank Test

##### Overall results

##   
## Wilcoxon signed rank test with continuity correction  
##   
## data: wsr\_rice\_prices\_data\_overall$rice\_price\_org\_kg\_usd and wsr\_rice\_prices\_data\_overall$rice\_price\_conv\_kg\_usd  
## V = 620, p-value = 3.058e-07  
## alternative hypothesis: true location shift is greater than 0

## Overall Wilcoxon Signed Rank test p-value (one-tailed): 1.528882e-07

##### Country-level results: Brazil

##   
## Wilcoxon signed rank test with continuity correction  
##   
## data: wsr\_rice\_prices\_data\_brazil$rice\_price\_org\_kg\_usd and wsr\_rice\_prices\_data\_brazil$rice\_price\_conv\_kg\_usd  
## V = 55, p-value = 0.002945  
## alternative hypothesis: true location shift is greater than 0

## Overall Wilcoxon Signed Rank test p-value (one-tailed): 0.001472318

##### Country-level results: India

##   
## Wilcoxon signed rank exact test  
##   
## data: wsr\_rice\_prices\_data\_india$rice\_price\_org\_kg\_usd and wsr\_rice\_prices\_data\_india$rice\_price\_conv\_kg\_usd  
## V = 45, p-value = 0.04199  
## alternative hypothesis: true location shift is greater than 0

## Overall Wilcoxon Signed Rank test p-value (one-tailed): 0.02099609

##### Country-level results: UK

##   
## Wilcoxon signed rank exact test  
##   
## data: wsr\_rice\_prices\_data\_uk$rice\_price\_org\_kg\_usd and wsr\_rice\_prices\_data\_uk$rice\_price\_conv\_kg\_usd  
## V = 120, p-value = 3.052e-05  
## alternative hypothesis: true location shift is greater than 0

## Overall Wilcoxon Signed Rank test p-value (one-tailed): 1.525879e-05

#### Table S1: City-level summary statistics

|  | Organic sample size (n) | Conventional sample size (n) | Organic median (IQR), min-max (US$) | Conventional median (IQR), min-max (US$) |
| --- | --- | --- | --- | --- |
| Brazil | | | | |
| Rio de Janeiro | 9 | 9 | 2.88 (0.25), 2.11-4.61 | 1.10 (0.17), 0.88-1.34 |
| Sao Paolo | 1 | 1 | 2.83 (0.00), 2.83-2.83 | 1.13 (0.00), 1.13-1.13 |
| Sinop | 6 | 6 | 1.07 (0.02), 1.03-1.18 | 1.07 (0.02), 1.03-1.18 |
| total | 16 | 16 | — | — |
| India | | | | |
| Hyderabad | 1 | 1 | 1.30 (0.00), 1.30-1.30 | 0.83 (0.00), 0.83-0.83 |
| Visakhapatnam | 9 | 9 | 1.02 (0.45), 0.61-3.20 | 0.82 (0.38), 0.49-1.31 |
| total | 10 | 10 | — | — |
| UK | | | | |
| Birmingham | 2 | 2 | 5.24 (0.69), 4.54-5.93 | 3.09 (0.06), 3.03-3.15 |
| Edinburgh | 3 | 3 | 3.97 (0.31), 3.46-4.08 | 2.10 (0.11), 1.98-2.21 |
| London | 10 | 10 | 7.62 (5.07), 4.92-11.95 | 3.93 (1.97), 1.78-8.04 |
| total | 15 | 15 | — | — |

#### Table S1: Country-level summary statistics

|  | Country | Organic sample size (n) | Conventional sample size (n) | Organic median (IQR), min-max (US$) | Conventional median (IQR), min-max (US$) |
| --- | --- | --- | --- | --- | --- |
|  | Brazil | 16 | 16 | 2.68 (1.80), 1.03-4.61 | 1.08 (0.11), 0.88-1.34 |
|  | India | 10 | 10 | 1.10 (0.42), 0.61-3.20 | 0.82 (0.33), 0.49-1.31 |
|  | UK | 15 | 15 | 5.63 (4.64), 3.46-11.95 | 3.15 (2.02), 1.78-8.04 |
| total | — | 41 | 41 | — | — |

## 3. What are the marketing characteristics of organic food in urban food environments? How does this vary across different geographic and socioeconomic contexts?

### Terminologies

#### Table 6

##### Overall

Table 1: Table 6 - Overall

|  | Category | Total organic products | Organic, n(%) | Natural, n(%) | Chemical-free, n(%) | Pesticide-free, n(%) | Bioproduct, n(%) | Bio, n(%) | Eco, n(%) | GMO-free, n(%) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | beverages | 326 | 175 (59%) | 152 (39%) | 3 (1%) | 4 (1%) | 0 (0%) | 2 (1%) | 15 (6%) | 2 (0%) |
|  | fresh produce | 112 | 89 (77%) | 24 (25%) | 0 (0%) | 2 (1%) | 0 (0%) | 0 (0%) | 1 (1%) | 1 (1%) |
|  | other | 253 | 176 (72%) | 73 (28%) | 12 (5%) | 20 (8%) | 2 (1%) | 1 (0%) | 18 (7%) | 13 (6%) |
| total | — | 691 | 440 | 249 | 15 | 26 | 2 | 3 | 34 | 16 |

##### Brazil

Table 1: Table 6 - Brazil

|  | Category | Total organic products | Organic, n(%) | Natural, n(%) | Chemical-free, n(%) | Pesticide-free, n(%) | Bioproduct, n(%) | Bio, n(%) | Eco, n(%) | GMO-free, n(%) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | beverages | 33 | 27 (89%) | 6 (13%) | 2 (5%) | 1 (3%) | 0 (0%) | 0 (0%) | 5 (36%) | 0 (0%) |
|  | fresh produce | 32 | 29 (93%) | 1 (2%) | 0 (0%) | 1 (3%) | 0 (0%) | 0 (0%) | 1 (3%) | 0 (0%) |
|  | other | 27 | 25 (93%) | 3 (8%) | 6 (30%) | 4 (25%) | 2 (7%) | 1 (3%) | 7 (34%) | 2 (20%) |
| total | — | 92 | 81 | 10 | 8 | 6 | 2 | 1 | 13 | 2 |

##### India

Table 1: Table 6 - India

|  | Category | Total organic products | Organic, n(%) | Natural, n(%) | Chemical-free, n(%) | Pesticide-free, n(%) | Bioproduct, n(%) | Bio, n(%) | Eco, n(%) | GMO-free, n(%) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | beverages | 112 | 13 (21%) | 101 (81%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
|  | fresh produce | 21 | 8 (38%) | 16 (75%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
|  | other | 131 | 59 (51%) | 67 (47%) | 4 (3%) | 15 (11%) | 0 (0%) | 0 (0%) | 11 (8%) | 10 (8%) |
| total | — | 264 | 80 | 184 | 4 | 15 | 0 | 0 | 11 | 10 |

##### UK

Table 1: Table 6 - UK

|  | Category | Total organic products | Organic, n(%) | Natural, n(%) | Chemical-free, n(%) | Pesticide-free, n(%) | Bioproduct, n(%) | Bio, n(%) | Eco, n(%) | GMO-free, n(%) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | beverages | 181 | 135 (77%) | 45 (19%) | 1 (1%) | 3 (2%) | 0 (0%) | 2 (1%) | 10 (7%) | 2 (1%) |
|  | fresh produce | 59 | 52 (91%) | 7 (9%) | 0 (0%) | 1 (1%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (1%) |
|  | other | 95 | 92 (102%) | 3 (2%) | 2 (2%) | 1 (1%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (1%) |
| total | — | 335 | 279 | 55 | 3 | 5 | 0 | 2 | 10 | 4 |