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Tables

Table 1. General Study Characteristics

		<u>Full Sample</u>		<u>Cobb Papers</u>		<u>New papers</u>	
		N	%	N	%	N	%
Country	US	93	82.3	59	89.4	34	72.3
	Canada	10	8.8	7	10.6	3	6.4
	UK	5	4.4	-	-	5	10.6
	Australia	3	2.7	-	-	3	6.4
	Germany	1	0.9	-	-	1	2.1
	New Zealand	1	0.9	-	-	1	2.1
Gender	Mixed	100	88.5	59	89.4	41	87.2
	Females only	13	11.5	7	10.6	6	12.8
Age	Mixed	1	1.8	1	1.5	1	2.1
	Adults	75	66.4	45	68.2	31	63.8
	Children	36	31.9	20	30.3	16	34.0
Race	Mixed	73	64.5	43	65.2	30	63.8
	Mostly ethnic minority	10	8.8	4	6.1	6	12.8
	Mostly white	10	8.8	7	10.6	3	6.4
	Not reported	20	17.7	12	18.2	8	17.0
SES	Mixed	71	62.8	43	65.2	28	59.6
	High	2	1.8	1	1.5	1	2.1
	Low	19	16.8	11	16.7	8	17.0
	Not reported	21	18.6	11	16.7	10	21.3
Urban/rural	Mixed	33	29.2	20	30.3	13	17.7
	Urban	30	26.5	1	1.5	12	25.5
	Rural	3	2.7	18	27.3	2	4.3
	Not reported	47	41.6	27	40.9	20	42.6
Design	Cross-sectional	87	73.5	56	84.8	31	66.0
	Longitudinal	26	23.0	10	15.2	16	34.0

N = number of studies; SES = socioeconomic status; New papers = papers published after the Cobb review.

Table 2. Counts of area-based measures of the RFE

	UNIT OF MEASUREMENT									TOTAL
	Count/area	Count/ population	Non- standardised count	Presence vs absence	Relative	Audit score	Variety	Other	Unclear	
Areal (N = 41)										
Census block group	3		1					1		5
Census tract	4	5	8	4	3	1	2	3		30
Zip code	1	3	1					2		7
Researcher defined	4	3	1	1	2		1			12
Other - administrative	1							1	1	2
Buffer – Euclidian (N = 23)										
<=200m	3*	1	n/a	1						5
>200-400m	5*	1	n/a	1						7
>400-800m	14*	2	n/a	2	1					19
>800-1600m	15*	2	n/a	4	3	1	1	1	3	30
>1600-2400m	5*	1	n/a							6
>2400-3200m	5*	1	n/a							6
>3200m	5*	1	n/a	1				1	1	9
Buffer – Network (N = 27)										
<=200m										0
>200-400m	1	1	2	3						5
>400-800m	3		8	3	2	3		1		12
>800-1600m	2	1	4	5	4	4	1	2		19
>1600-2400m			3			2				2
>2400-3200m	1		3	2	1			1		5
>3200m			5	3		3		1		7
Buffer – Undefined (N = 8)										
>200-400m	1		1	1				1		4
>400-800m			1							1
>800-1600m			2	1	1			2		5
>1600-2400m	1		4	2	1			2		10
>2400-3200m			1		1					2
>3200m			2	1	1			2		5
TOTAL	74	22	46	35	20	14	5	21	5	

Note. Many studies employed multiple measures of the RFE, and thus the total number of measures (242) exceeds the number of studies (113). N = number of studies employing each broad method. Non-standardised count = measures of the raw counts of outlets that are not standardised e.g. to a given area or population. Relative = measures of the availability of one outlet type relative to one or more other outlet types. Audit score = measures derived from within-store audits e.g. the total shelf space devoted to fruits and vegetables within a buffer. Variety = measures of the number of different outlet types. Other = other measures of the RFE, including counts of outlets relative to the length of roads within a buffer, weighted counts of outlets and counts per area

per population. Buffer – Undefined = studies that described using a buffer measure of the RFE, but did not describe whether this was a network or Euclidian buffer.

**Measures of the raw count of outlets within Euclidian buffers were classified as count/area, because Euclidian buffers of a given radius have a fixed area.*

Table 3. GeoFERN reporting quality by domain.

GeoFERN domains & associated marking criteria	Full details N (%)	Partial details N (%)	No details N (%)	Not applicable
DOMAIN 1: DATA SOURCE				
Overall	55 (48.7%)	47 (41.6%)	11 (9.7%)	-
Name of data creator reported?	79 (76.0%)	5 (4.8%)	20 (19.2%)	9 ⁽¹⁾
Dataset name reported?	42 (58.3%)	6 (8.3%)	24 (33.3%)	4 ⁽¹⁾
Publication date reported ⁽²⁾	71 (62.8%)	3 (2.7%)	39 (34.5%)	0
DOMAIN 2: EXTRACTION METHODS				
Overall	28 (27.5%)	31 (30.4%)	43 (42.1%)	11 ⁽³⁾
Extraction Method Reported	54 (52.9%)	11 (10.8%)	37 (36.3%)	11 ⁽³⁾
Search Terms Reported	53 (52.0%)	17 (16.7%)	32 (31.4%)	11 ⁽³⁾
DOMAIN 3: CONSTRUCT DEFINITIONS				
Overall	18 (15.9)	95 (84.1)	0	-
Construct names listed	112 (99.1)	1 (0.9)	0	-
Construct scope clear	60 (53.1)	26 (23.0)	27 (23.9)	-
Classification method clear	51 (45.1)	25 (22.1)	37 (32.7)	-
Examples provided	37 (32.7)	13 (11.5)	63 (55.8)	-
DOMAIN 4: GEOCODING METHODS				
Overall	3 (2.7)	103 (91.2)	7 (6.2)	-
Clear whether geocoding used?	61 (54.0)	32 (28.3)	20 (17.7)	-
Address model reported?	15 (13.3)	28 (24.8)	63 (55.8)	7 ⁽⁴⁾
Match rate reported	83 (73.5)	-	23 (20.4)	7 ⁽⁴⁾
Software reported	48 (42.5)	1 (0.9)	57 (50.4)	7 ⁽⁴⁾
Urban/rural reported	22 (19.5)	44 (38.9)	47 (41.6)	-
DOMAIN 5: RFE METRICS				
Overall	22 (19.5)	91 (80.5)	0	-
Conceptual environment defined	110 (97.3)	-	3 (2.7)	-
Areal (N = 41)				
Type of zone defined?	40 (97.6)	-	1 (2.4)	-
Boundary data reported?	14 (37.8)	-	23 (62.2)	4 ⁽⁵⁾
Intensity metric reported?	38 (92.7)	-	3 (7.3)	-
Buffer (N = 60)				
Buffer type defined?	52 (86.7)	-	8 (13.3)	-
Buffer size defined?	60 (100.0)	-	0	-
Intensity metric defined?	59 (98.3)	-	1 (1.7)	-
Proximity (N = 37)				
Proximity type defined?	32 (86.5)	-	5 (13.5)	-
Network (N = 46)				
Types of roads/paths described	43 (93.5)	-	3 (6.5)	-
Network data cited?	7 (15.2)	-	39 (84.8)	-
Gravity (N = 5)				
Radius defined?	4 (80.0)	-	1 (20.0)	-
Decay function defined?	4 (80.0)	-	1 (20.0)	-
Other (N = 5)				
Metric clearly described?	5 (100.0)	-	0	-

Table shows the number (N) of studies that reported full, partial or none of the details listed as essential within the GeoFERN reporting checklist (the 'marking criteria') for each GeoFERN domain (23) ('Overall' score). Also shown is a break-down of the reporting quality (i.e. numbers of studies providing full, partial or no details) for each specific marking criterion. The 'data creator' is the person or entity that created the RFE data e.g. 'Dun & Bradstreet'. 'Extraction methods' refer to the methods used to extract food outlets of interest from a wider dataset which may contain food outlets not of interest and/or non-food businesses. Often search terms are used, which might include outlet names or classifications within the dataset. Outlet 'constructs' include e.g. 'fast food outlets', 'supermarkets' and 'convenience stores'. RFE = Retail Food Environment. Percentages shown are the percentages of eligible studies for each marking criterion; excluding those for which GeoFERN marking criterion was not applicable.

⁽¹⁾ Not applicable because food environment data was collected through street audits, or because dataset does not have a name.

⁽²⁾ Or date of audit reported if data was collected via street audit.

⁽³⁾ Not applicable because data was collected via street audits, or no data extraction was required.

⁽⁴⁾ Not applicable because geocoding was not required.

⁽⁵⁾ Boundary data was not applicable for 4 studies; wherein areal units were researcher-defined.

Table 4. Numbers of statistically significant positive, negative and null associations between RFE and weight status.

Exposure-population grouping	Positive*		Null		Negative*		Total N	No. of studies
	N	%	N	%	N	%		
FAST FOOD OUTLETS								
Full sample	84	20.8%	303	75.0%	17	4.2%	404	74
High quality studies only	12	30.8%	26	66.7%	1	2.6%	39	8
Adults	52	22.1%	173	73.6%	10	4.3%	235	44
- Males	3	9.4%	24	75.0%	5	15.6%	32	10
- Females	13	25.5%	34	66.7%	4	7.8%	51	16
- Low SES	4	22.2%	14	77.8%	0	0.0%	18	6
- High SES	1	7.7%	12	92.3%	0	0.0%	13	5
- White	2	9.1%	19	86.4%	1	4.5%	22	7
- Urban	13	29.5%	31	70.5%	0	0.0%	44	13
Children	32	19.5%	126	76.8%	6	3.7%	164	28
- Low SES	12	37.5%	19	59.4%	1	3.1%	32	10
- Non-white	0	0.0%	8	88.9%	1	11.1%	9	5
- Urban	2	4.7%	39	90.7%	2	4.7%	43	9
CONVENIENCE STORES								
Full sample	30	10.9%	218	79.6%	26	9.5%	274	52
High quality studies only	0	0.0%	47	95.9%	2	4.1%	49	7
Adults	11	6.9%	125	78.6%	23	14.5%	159	31
- Males	1	3.4%	20	69.0%	8	27.6%	29	8
- Females	7	12.7%	43	78.2%	5	9.1%	55	14
- Low SES	1	5.0%	19	95.0%	0	0.0%	20	7
- White	2	8.3%	19	79.2%	3	12.5%	24	5
- Urban	2	5.7%	26	74.3%	7	20.0%	35	11
- Rural	0	0.0%	18	100.0%	0	0.0%	18	5
Children	19	16.5%	93	80.9%	3	2.6%	115	21
- Females	4	16.0%	21	84.0%	0	0.0%	25	5
- Low SES	11	39.3%	16	57.1%	1	3.6%	28	8
- Non-white	7	33.3%	12	57.1%	2	9.5%	21	6
- Urban	2	10.5%	16	84.2%	1	5.3%	19	5
SUPERMARKETS/GROCERY STORES								
Full sample	37	6.6%	454	80.5%	73	12.9%	564	70
High quality studies only	5	4.0%	108	85.7%	13	10.3%	126	12
Adults	34	9.0%	293	77.7%	50	13.3%	377	46
- Males	0	0.0%	36	83.7%	7	16.3%	43	9
- Females	17	12.6%	102	75.6%	16	11.9%	135	20
- Low SES	5	7.4%	60	88.2%	3	4.4%	68	12
- White	7	12.3%	47	82.5%	3	5.3%	57	5
- Urban	6	6.3%	74	77.9%	15	15.8%	95	16
- Rural	7	15.9%	37	84.1%	0	0.0%	44	5
Children	3	1.6%	157	86.3%	22	12.1%	182	23
- Low SES	0	0.0%	17	89.5%	2	10.5%	19	8
- Urban	0	0.0%	24	92.3%	2	7.7%	26	8
RESTAURANTS								
Full sample	11	6.3%	131	75.3%	32	18.4%	174	29
High quality studies only	4	9.8%	34	82.9%	3	7.3%	41	5
Adults	1	1.0%	71	70.3%	29	28.7%	101	18
- Males	0	0.0%	18	62.1%	11	37.9%	29	8
- Females	0	0.0%	24	72.7%	9	27.3%	33	11
- Urban	0	0.0%	16	76.2%	5	23.8%	21	5
Children	10	13.7%	60	82.2%	3	4.1%	73	11

N = number of associations. SES = socioeconomic status. *Positive associations' refer to statistically significant ($p < 0.05$) associations indicating increased access/exposure to food outlets is associated with increased obesity, and 'negative associations' refer to statistically significant associations indicating increased access/exposure to food outlets is associated with decreased obesity.

Table 5. Numbers of statistically significant positive, negative and null associations between RFE and weight status, stratified by measurement method

Exposure-method grouping	Positive*		Null		Negative*		Total N	No. of studies
	N	%	N	%	N	%		
DATA SOURCE								
Fast Food Outlets								
- Government	13	16.0%	65	80.2%	3	3.7%	81	19
- Commercial	59	24.5%	170	70.5%	12	5.0%	241	36
Supermarket/Grocery								
- Government	16	8.8%	148	81.3%	18	9.9%	182	20
- Commercial	5	1.8%	229	81.5%	47	16.7%	281	28
EXTRACTION METHODS								
Fast Food Outlets								
- Proprietary classifications	54	26.3%	142	69.3%	9	4.4%	205	30
- Combination of methods	8	16.3%	39	79.6%	2	4.1%	49	13
Supermarket/Grocery								
- Proprietary classifications	16	4.8%	272	82.2%	43	13.0%	331	24
- Combination of methods	5	6.3%	56	70.9%	18	22.8%	79	14
OUTLET CLASSIFICATIONS								
Fast Food Outlets								
- All	84	20.8%	303	75.0%	17	4.2%	404	74
- Narrow	24	26.1%	66	71.7%	2	2.2%	92	12
- Moderate	29	22.3%	97	74.6%	4	3.1%	130	26
- Broad	12	19.4%	48	77.4%	2	3.2%	62	10
Supermarket**								
- All	37	6.6%	454	80.5%	73	12.9%	564	70
- Narrow	2	1.7%	90	77.6%	24	20.7%	116	18
- Moderate	2	2.9%	59	86.8%	7	10.3%	68	14
- Broad	7	10.4%	54	80.6%	6	9.0%	67	9
NEIGHBOURHOOD DEFINITION								
Fast Food Outlets - Adults								
- Areal measures	10	17.9%	45	80.4%	1	1.8%	56	18
- Person-centric measures	42	23.5%	128	71.5%	9	5.0%	179	31
- Buffer <1km	9	36.0%	16	64.0%	0	0.0%	25	6
- Buffer 1-2km	10	18.5%	43	79.6%	1	1.9%	54	17
- Buffer > 2km	15	34.1%	28	63.6%	1	2.3%	44	11
Fast Food Outlets - Children								
- Areal measures	6	18.8%	24	75.0%	2	6.3%	32	7
- Person-centric measures	26	19.7%	102	77.3%	4	3.0%	132	23
- Buffer ≤ 400m	10	25.0%	30	75.0%	0	0.0%	40	8
- Buffer > 400m	1	2.0%	45	91.8%	3	6.1%	49	13
Supermarket/Grocery - Adults								
- Areal measures	11	12.2%	71	78.9%	8	8.9%	90	19
- Person-centric measures	23	8.0%	222	77.4%	42	14.6%	287	33
- Buffer <1km	3	8.3%	30	83.3%	3	8.3%	36	6
- Buffer 1-2km	8	10.8%	53	71.6%	13	17.6%	74	15
- Buffer > 2km	6	7.3%	62	75.6%	14	17.1%	82	8
Supermarket/Grocery - Children								
- Areal measures	2	2.9%	62	88.6%	6	8.6%	70	6
- Person-centric measures	1	0.9%	95	84.8%	16	14.3%	112	19
- Buffer ≤400m	0	0.0%	17	100.0%	0	0.0%	17	5
- Buffer > 400m	1	1.9%	49	94.2%	2	3.8%	52	9
METRIC TYPE								
Fast Food Outlets								
- Count (non-standardised)	7	18.9%	25	67.6%	5	13.5%	37	17
- Count/area	31	22.8%	104	76.5%	1	0.7%	136	26
- Count/capita	7	20.0%	28	80.0%	0	0.0%	35	11
- Presence/absence	0	0.0%	25	96.2%	1	3.8%	26	8
- Proximity	22	28.6%	53	68.8%	2	2.6%	77	25
Supermarket/Grocery								
- Count (non-standardised)	8	6.6%	102	83.6%	12	9.8%	122	16
- Count/area	9	5.7%	131	83.4%	17	10.8%	157	17
- Count/capita	4	7.5%	40	75.5%	9	17.0%	53	10
- Presence/absence	6	18.8%	23	71.9%	3	9.4%	32	11
- Proximity	6	6.3%	75	78.1%	15	15.6%	96	26
ALTERNATIVE MEASURES								
Healthy – composite	2	3.0%	48	72.7%	16	24.2%	66	9
Unhealthy – relative	23	21.3%	85	78.7%	0	0.0%	108	12
Healthy – score	9	9.2%	74	75.5%	15	15.3%	98	7
Total outlets	3	7.7%	33	84.6%	3	7.7%	39	8
Total restaurants (including fast food)	2	8.3%	19	79.2%	3	12.5%	24	8
Total food stores	3	8.6%	30	85.7%	2	5.7%	35	5

N = number of associations. Supplement 6 provides details on definitions of 'narrow', 'moderate' and 'broad' scope.

**Positive associations' refer to statistically significant ($p < 0.05$) associations indicating increased access/exposure to food outlets is associated with increased obesity, and 'negative associations' refer to statistically significant associations indicating increased access/exposure to food outlets is associated with decreased obesity.*

***Excludes grocery stores, unless these were included under the same classification as supermarkets.*

Figures

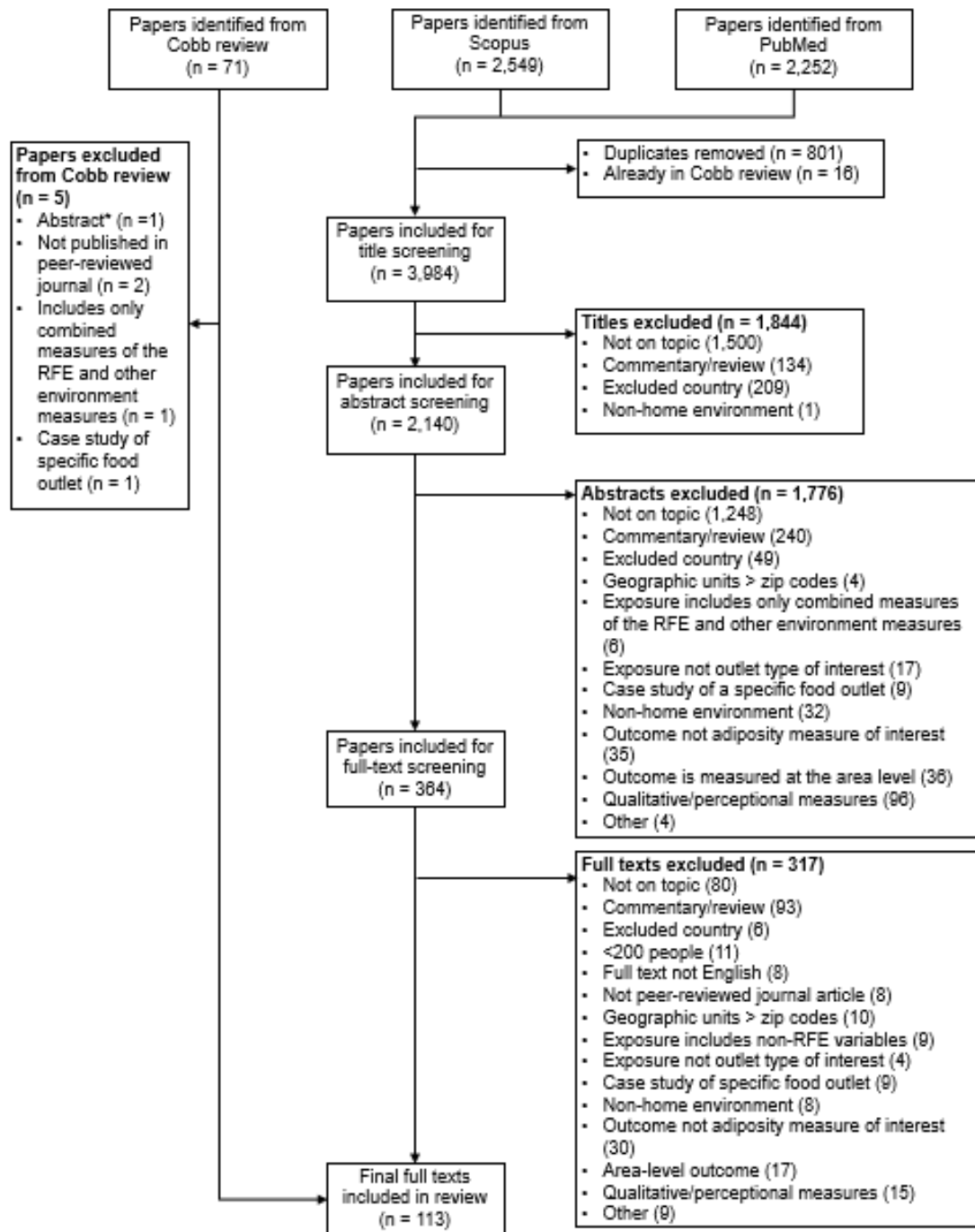


Figure 1. Flow chart illustrating screening process for this review. RFE = Retail Food Environment. Note, for the papers excluded from the Cobb review, the third and fourth criteria listed above were also applied in the original Cobb review, but appeared to have been incorrectly applied in respect of two papers. *Article was an abstract corresponding to a full-text paper identified in the top-up search and thus was excluded to avoid duplication.

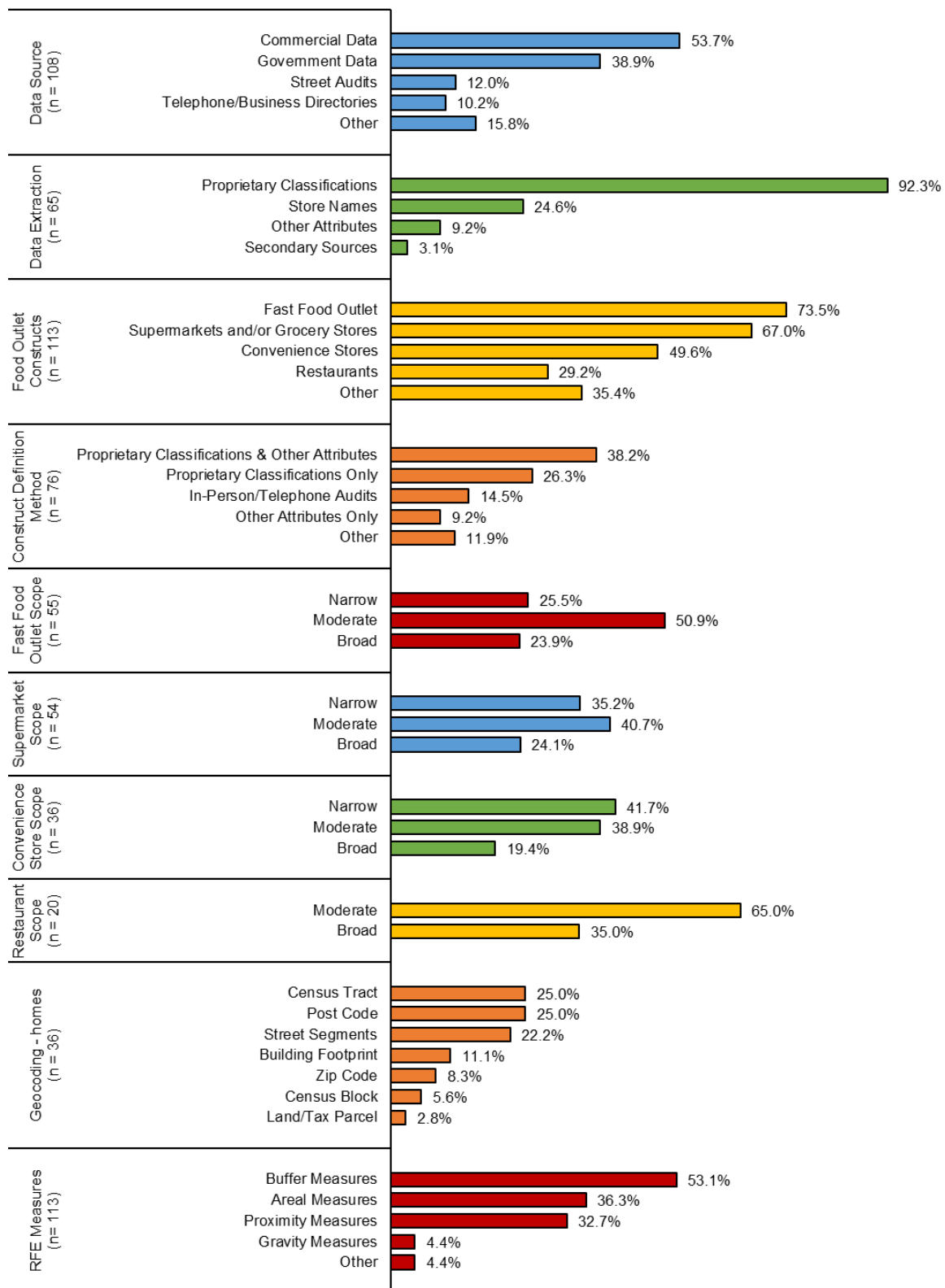


Figure 2. Methods used within studies. *n* = number of studies for which methodological aspect is applicable and for which sufficient methodological information was provided. RFE = Retail Food Environment. Some studies used more than one method within a given methodological aspect, and thus percentages shown do not always add up to 100%. 'Other' data sources included internet searching, data from national mapping agencies, and satellite imagery. 'Other' food outlet constructs included various composite measures such as supermarkets and greengrocers combined, or fast food outlets and convenience stores combined. 'Other attributes' used for construct definition was limited

to information contained within the RFE dataset and included outlet name, size, number of employees or tills. 'Other' methods for applying outlet constructs included use of supplementary information e.g. websites, and interviews with local residents. 'Other' RFE metrics included e.g. a binary measure of whether the neighbourhood centroid was closer to a supermarket or ethnic market and measures of relative store 'attractiveness' (accounting for distance and store size).