



The built environment & children's eating, physical activity & weight status

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Healthy eating & physical activity

- Important for healthy growth
- Important for prevention of disease
 - Type 2 diabetes
 - Improved bone health
 - CVD risk factors
 - Overweight & obesity

'Supportive' environments

- Individual & social factors stronger determinants of behaviour, but individual choices can be constrained by physical environments
- Strong interest in environmental influences on adult behaviour
 - Access to supermarkets, shops & facilities
 - Transport: traffic/public transport
 - Urban design
- Little research has focused on children
- Children different to adults
 - Types/nature of physical activity
 - Less independence / autonomy → Strong influence of those responsible for care

Aims

- To examine associations between children's local neighbourhood environments and their:
 1. Eating behaviours
 2. Physical activity
 3. Weight status

* *DHS Public Health Research Project 2005/6*

Methods

- Cross-sectional study of 5-6 & 10-12 year-old children
 - Recruited from 24 primary schools in low, medium & high SES areas
 - Address details collected from 807 families
 - 343 5-6 y/o
 - 464 10-12 y/o
- Data for 10-12 y/o only presented here
 - Potentially more autonomy/independence

Assessment of eating behaviour

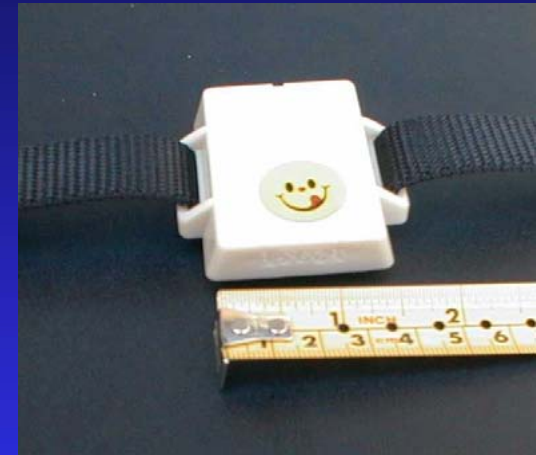
- 56-item Food Frequency Questionnaire: parent-complete (last week)
 1. Frequency/day high energy/fat food & drinks
 2. Frequency/day fruit/vegetables (excludes potato)
 3. Frequency/day 'takeaway-style' meals (savoury tarts, flans, pies, pasties & pizza)

- Frequency child ate takeaway or fast food each week (at or away from home)

Assessment of physical activity & weight status

➤ Accelerometer (MTI Actigraph)

- Worn ≤ 8 days, removed for water-based activity
- Mean mins/day MVPA based on 'complete' days (age-specific regression equation¹)



➤ Weight status

- Height & weight measured at school
- International age & sex-specific cut-points used to define overweight/obese²

Assessment of built environment

- Geographic Information Systems (GIS)
- Existing data sources:
 - VicMap Property, Address, Admin, Transport, Planning (State of Victoria)
 - Open Space 2005 (ARCUE)
 - Melway Map Images (Ausway Publishing)
- Food establishments & physical activity destinations
 - Locations sourced from councils; websites; electronic telephone directories; restaurant guide books.
- 'Local neighbourhood': 800m radius of home address

Food environment

- Categories:
 - Fruit & vegetable stores
 - Supermarkets & grocery stores
 - Bakeries, patisseries & cake shops
 - Butchers, poultry & seafood retailers
 - Restaurants, cafés & takeaway shops
 - Fast food outlets (8 most common)

- Three measures computed for each category:
 - Availability (presence) within 800m
 - Number (density) within 800m
 - Distance (km) to closest via the road network



Physical activity destinations



➤ Features:

- Public transport routes
- School attended
- Public open space/parks¹
- Playgrounds
- BMX facilities
- Skate facilities
- Leisure centres/gyms
- Swimming pools
- Outdoor courts
- Retail districts (strips/centres)

➤ Measures:

- Availability
- Number (density)
- Distance (km) to closest by road²
- Presence of a busy road en route to destination²

➤ Plus:

- Area of public open space
- Availability of, straight-line distance to & total km of **walking/cycling tracks**

¹ Excludes children in Greater Geelong area; ² Only if within 800m for playground & retail

Results: eating, physical activity & weight status

➤ Eating behaviours

- High energy/fat food & drinks: 6.6 times/day
- Fruit or vegetables: 6.2 times/day
- Takeaway-style meals: 1.8 times/week
- Takeaway or fast food: 1.3 times/week

➤ Physical activity

- 2.1 hours/day of physical activity

➤ Weight status

- 31% overweight or obese

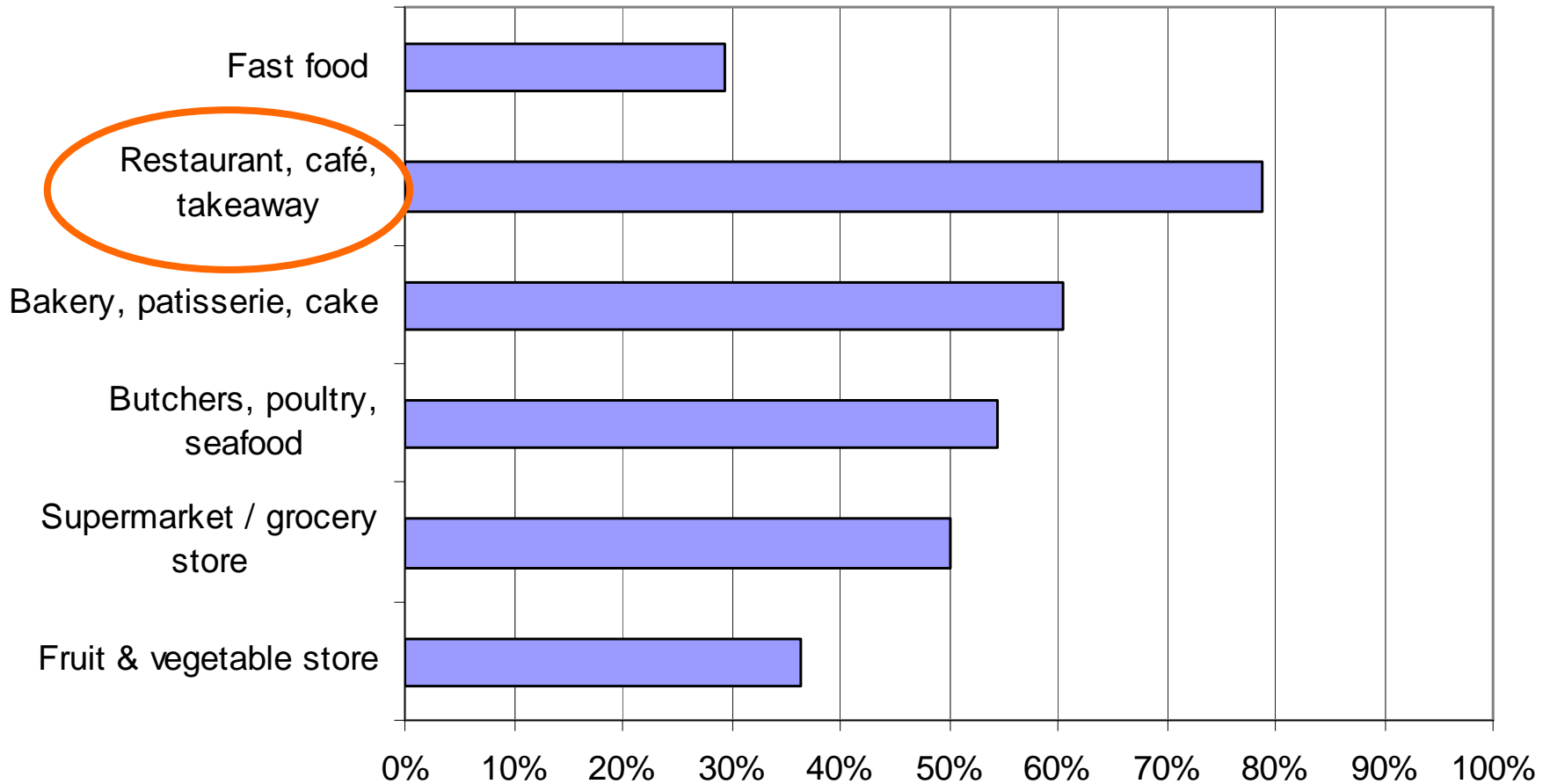


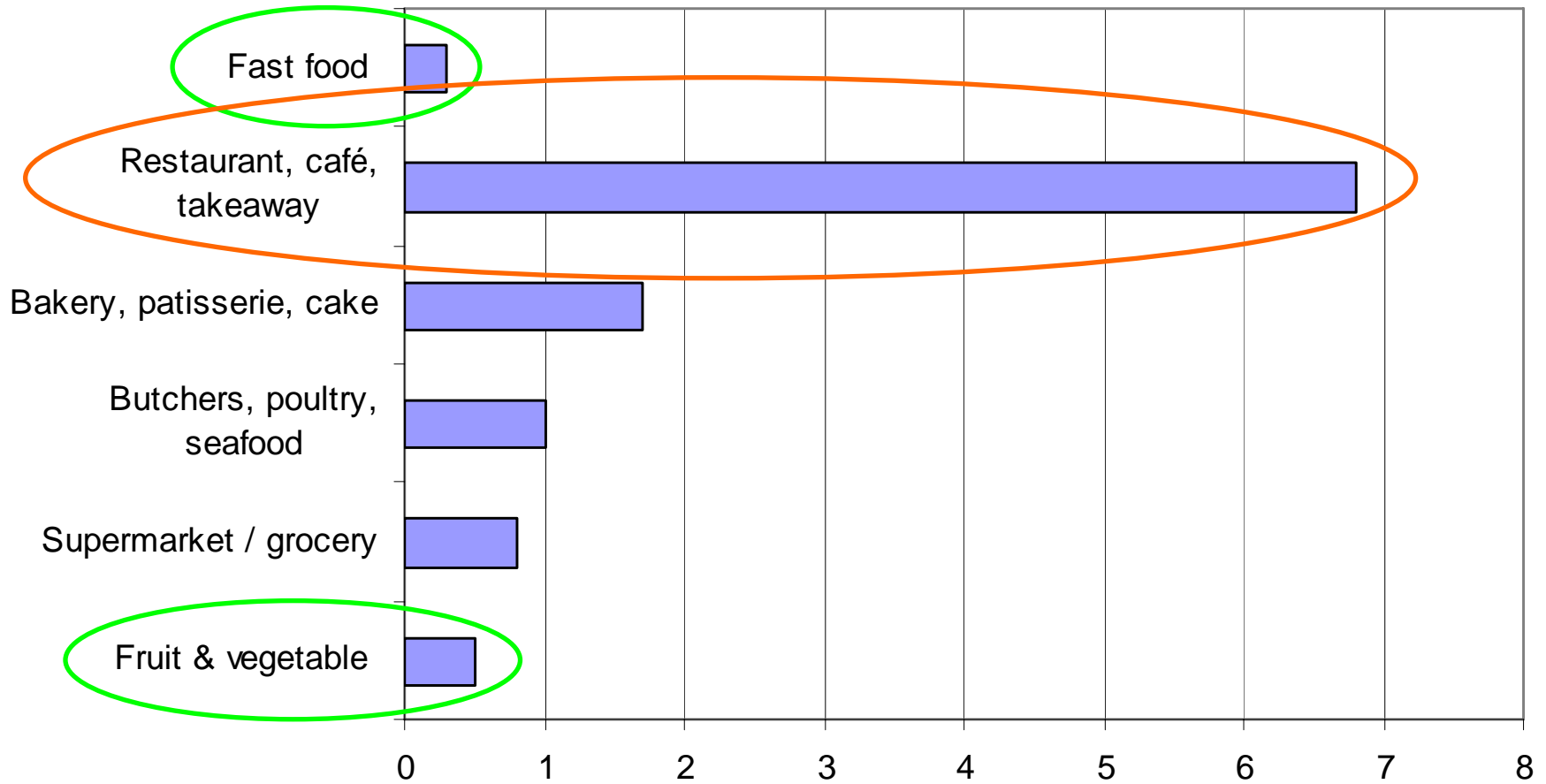
Food environment



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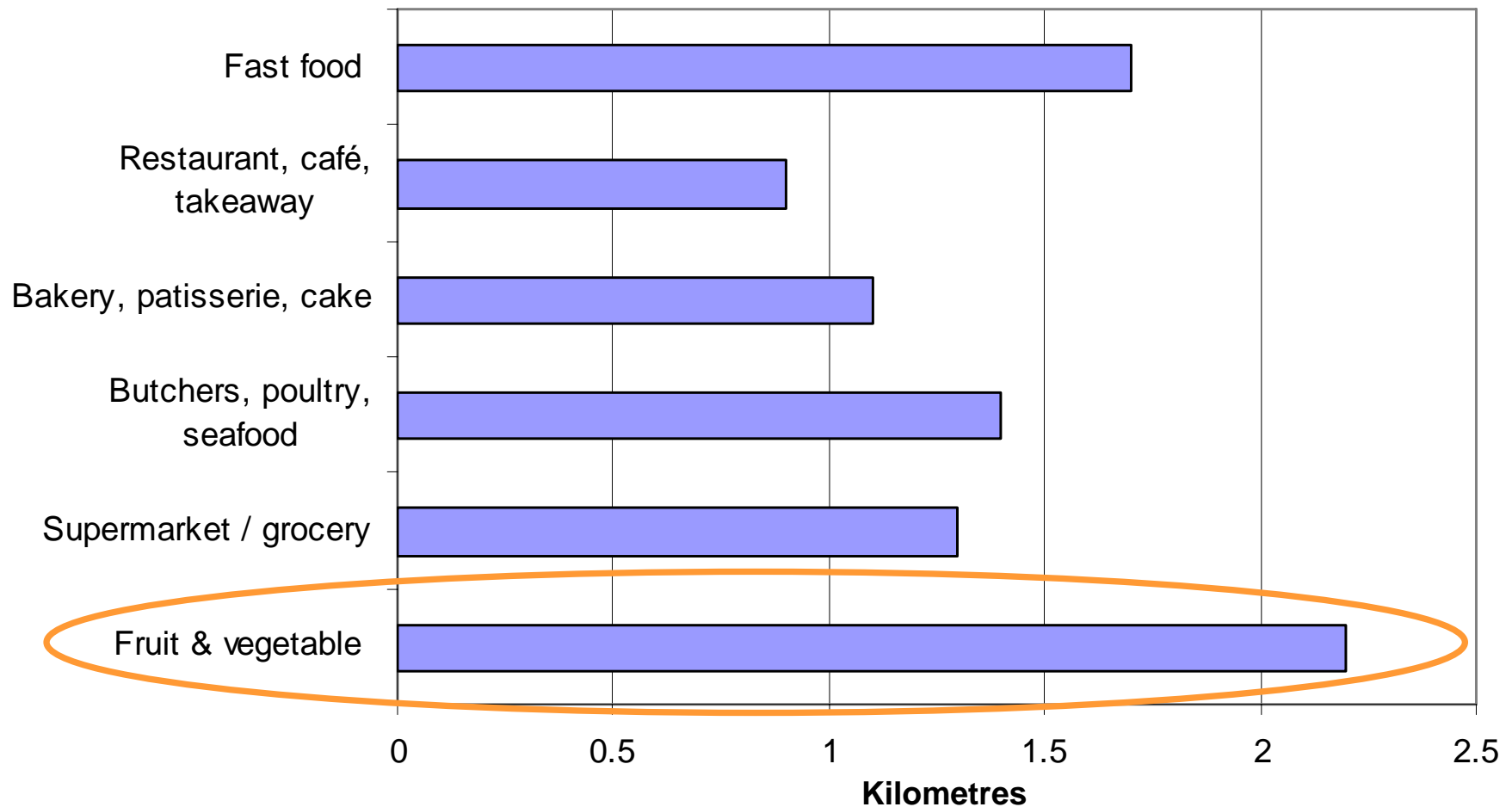
Availability of food establishments





**Number of food establishments
in local neighbourhood**

Distance (km) to the closest establishment along road



Associations with eating behaviour & weight status.....

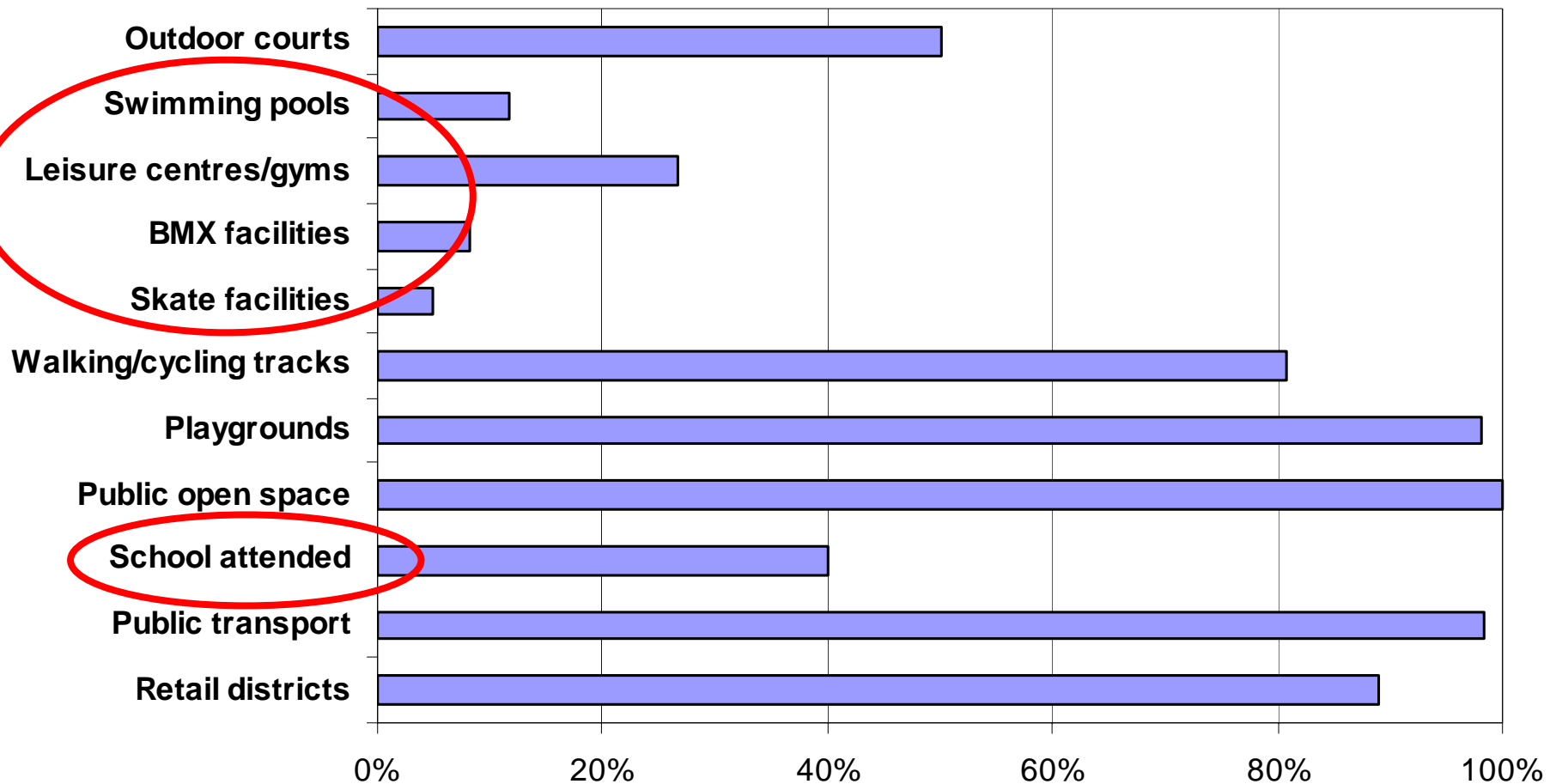
- Availability & number of establishments:
 - No associations
- Proximity to food establishment:
 - Further away the closest fast food outlet = more frequent consumption of fruit & vegetables (B=0.31)



Physical activity environment

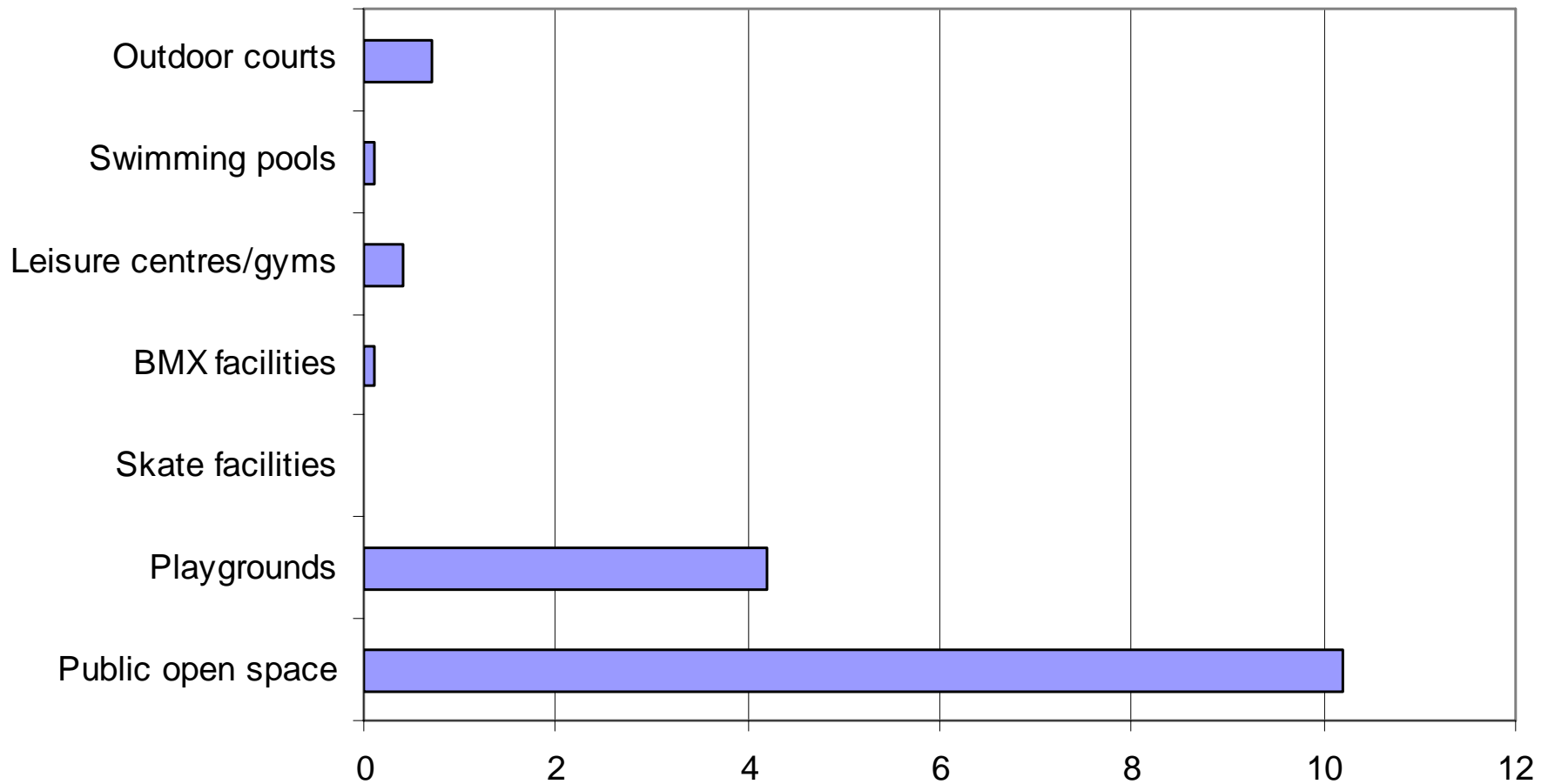


Availability of physical activity destinations in local neighbourhood

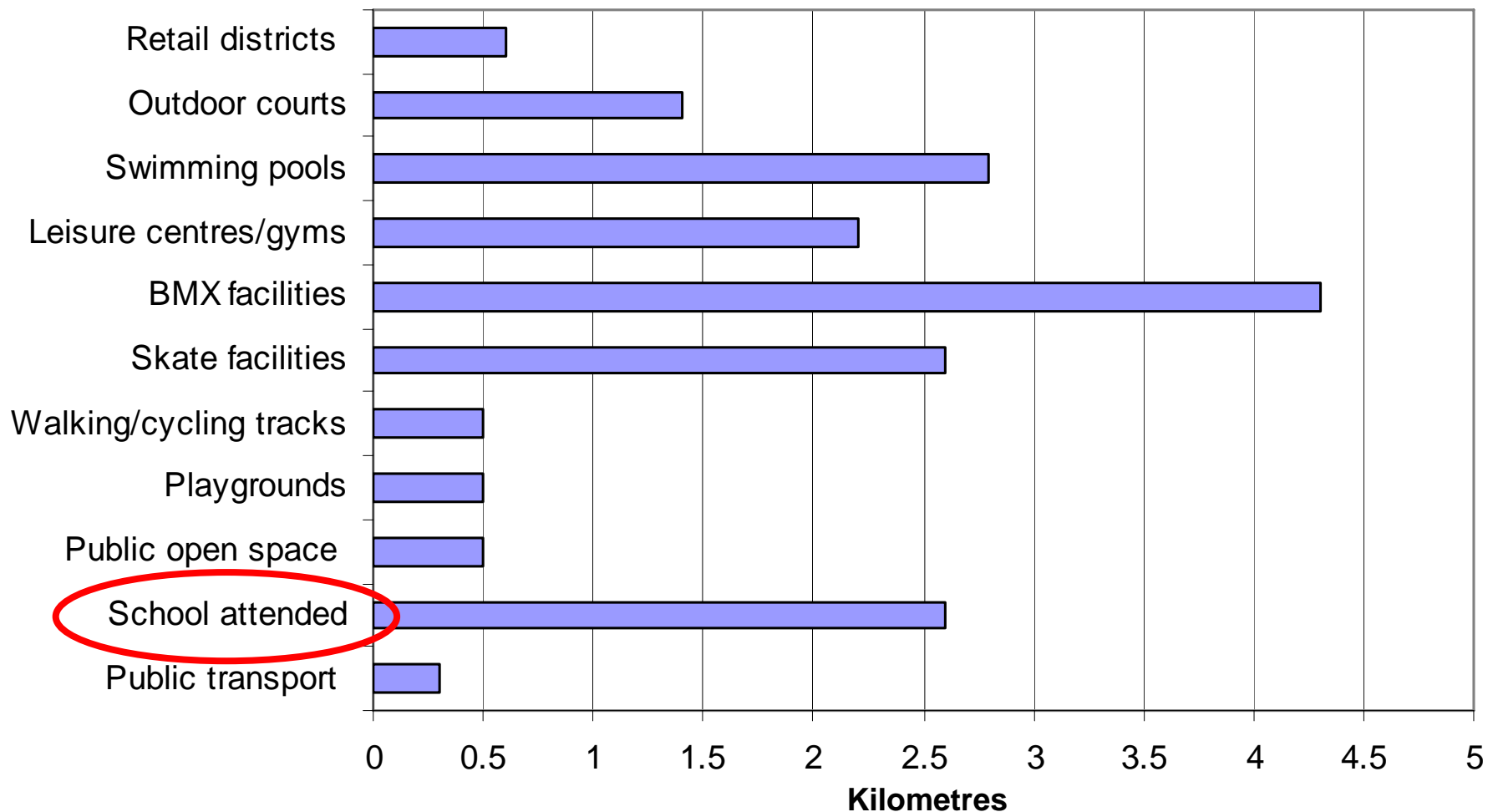


Number of destinations

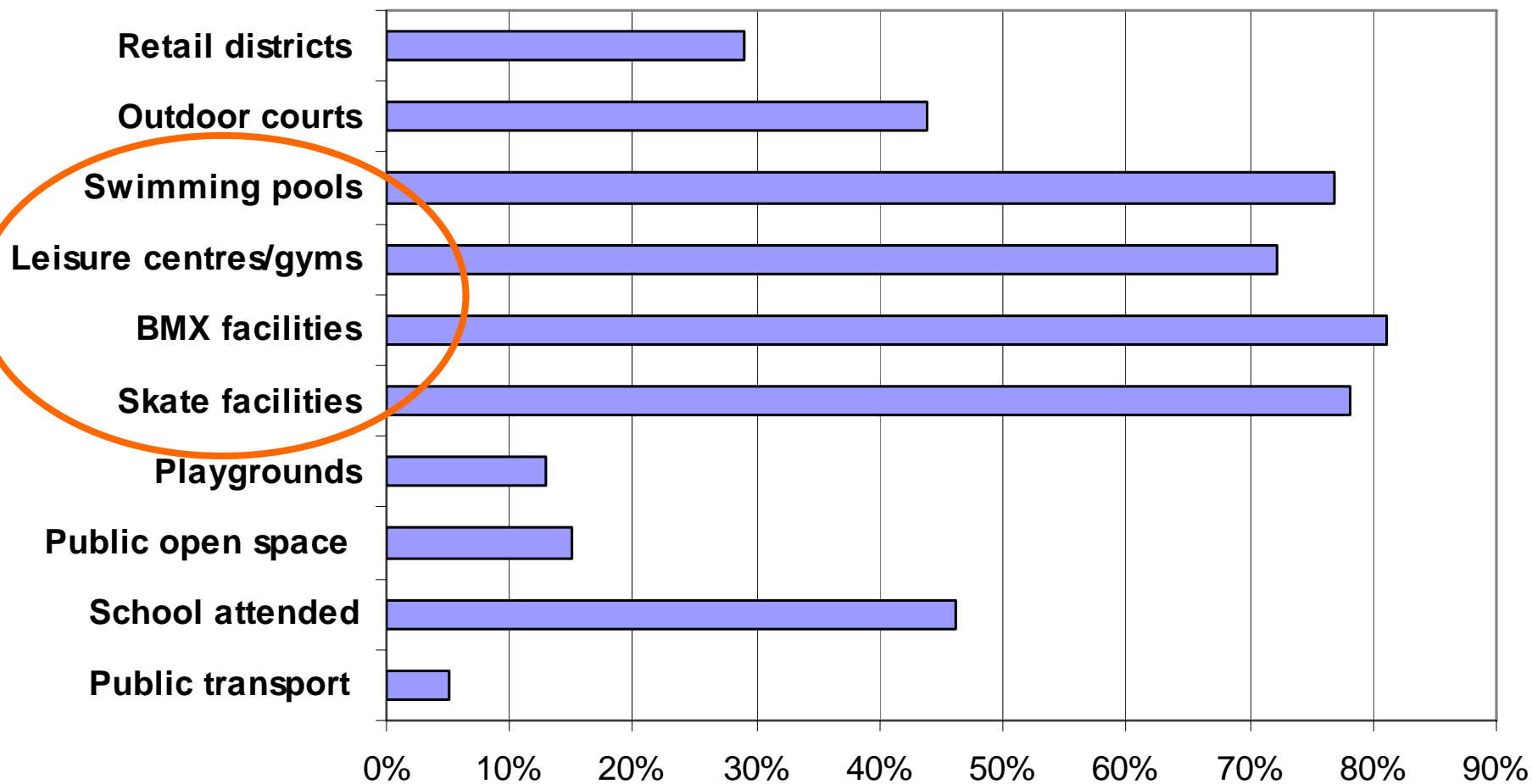
- 1.5 km of walking/cycling tracks
- 6.3 public transport routes
- 2.3 retail districts
- 5.9 km² of public open space accessible from 800m



Distance (km) to the closest establishment along road network



Busy road en route to destination



Associations with physical activity

- Less physical activity the further one lives to:
 - School: 1.5 mins/day less for each km (B=-1.5)
 - BMX facility: 1.6 mins/day less for each (B=-1.6)
- More physical activity the further one lives to:
 - Public open space: 4 mins/day more for each km (B=4.2)
- More physical activity if have busy road en route to:
 - Skate facility: 14 mins/day more physical activity (B=14.2)
 - Swimming pool: 11 mins/day more physical activity (B=11.0)

Associations with overweight or obesity

- Likelihood of being overweight or obese **reduced** by:
 - 50% if have a BMX facility in local neighbourhood (OR=0.5)
 - ~50% for each additional BMX facility (OR=0.47)
 - ~20% for each km of walking/bicycle track (OR=0.82)
 - ~40% for each km² of public open space (OR=0.62)
- **More likely** to be overweight or obese if have a **busy road** en route to BMX facility (OR=2.22)

Implications & recommendations – food environment

- One of the first studies of children – data are very preliminary
- Most children have access to a number of food outlets close to home
- Might be important to locate fast food outlets further from residential areas

Implications – physical activity

- Important destinations for 10-12 year-old children:
 - BMX facilities
 - Walking/cycling paths
 - Public open space
- Provide for inexpensive forms of recreation
- Destinations commonly walked or cycled to → accumulate physical activity 'getting there'
- More public open spaces = more options for families

Recommendations – physical activity

- All children should have access to public open spaces
 - Need further study of quality & positioning
- Walking/cycling tracks provided within residential areas
 - Safe environment for physical activity
- The need for children to cross roads should be considered when siting facilities
 - Safe crossing infrastructure important
- Age-appropriate physical activity facilities should be provided in local neighbourhoods
 - Eg. BMX facilities, walking/cycling paths for 10-12 year-olds



Thank you!