Obesity and local food environment
A Perth Metropolitan Study

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Western Australia's public health system aims:

• To ensure healthier, longer and better lives for all Western Australians

• To protect the health of our community by providing a safe, high quality, accountable and sustainable health care system
Epidemiology Branch
Department of Health
Western Australia

Our Aim:

To monitor, assess and report on health profiles and service utilisation for the WA population.

We provide information to:

- Guide policy development
- Identify emerging issues
- Prioritise service delivery
- Evaluate health system performance

For more info visit: http://www.public.health.wa.gov.au
Email: epi@health.wa.gov.au
GIS in WA Health Department

- Epidemiology Branch within Public Health Division
- 3 FTE + 0.4 contractor position
- Historically MapInfo domain, changed to ESRI suite due to increased spatial analysis requirement
USA

- ~3,790,000 sq mi
- 310,467,000 people
- ~80 ppl/sq mi
- Spend 13.5% GDP on Health
- Life expectancy ~78

Australia

- ~3,000,000 sq mi
- 21,000,000 people
- ~7 ppl/sq mi
- Spend 8.5% of GDP on Health
- Life expectancy ~82
Overview

- Background
- Data source
- Research methods
- Preliminary results and future plan
$41,000,000,000,000

"obesity is worsening throughout the developed world and becoming the top public health concern"
Stroke  
Cancer  
Diabetes  
Heart Disease  
Osteoarthritis
GPs
Hospitals
Nursing homes
Pharmaceuticals
Carers
Equipment
Unemployment
Tax revenue lost
Project Aims

• Is the availability of different food outlets around peoples homes associated with obesity in the Perth metropolitan area?

• Showing benefits of using GIS and statistics
People living in neighbourhoods crowded with fast-food and convenience stores but relatively few grocery or produce outlets are at significantly higher risk of suffering from obesity and diabetes.

(California Center for Public Health Advocacy (CCPHA) report, 2008)

The Lower the ratio of fast-food restaurants and convenience stores to grocery stores and produce vendors near people’s home, the lower the odds of being obese.

(Spence et al 2009)
Data Sources

- **HWSS - WA Health and Wellbeing Surveillance System**
  - Continuous data collection system.
  - Collected using a Computer Assisted Telephone Interview (CATI)
  - People are interviewed throughout the year with an accumulated sample of 7000 annually.
  - People aged 18+ was used in this study (9204 people from 2006-2008 survey)

- Food outlet dataset from all 39 Local Government Authorities
Types of foods used

- Fast food (FF)
- Restaurant food (RE)
- Healthy food (HF)
  - Supermarkets, fruit and veg shops, butchers
Density of Obese or Overweight people and Fast Food locations
Density of Obese people and SEIFA

SEIFA – Socio Economic Indexes for Area, a measure of disadvantage
Statistical analysis

- Logistic regression analysis
  - Obesity as outcome variable
  - Controlled for age, sex, self reported fruit, veg & takeaway consumption, area disadvantage

- Spatial Variables of Interest
  - Distance to nearest FF, HF & RE
  - Density of FF, HF & RE (in 2.5 & 5km buffers)
  - Ratio of FF to HF
Preliminary Results

- More likely to be obese if you are 40+
Preliminary Results

- More likely to be obese if you consume more takeaway
Preliminary Results

- More likely to be obese if you consume more takeaway each week.

Odds Ratios of being Obese by SEIFA Quintile

SEIFA – Socio Economic Indexes for Area, a measure of your disadvantage
Preliminary Results

No relationship found with:

- Sex
- Fruit & veg consumption

Took these variables out of the analysis as they were not significant
Preliminary Results Cont.

Odds of being obese is lower:

- Where high density of FF within 2.5km
  - (OR: 0.996 CI: 0.994 - 0.997)
- Where high density of HF within 2.5km
  - (OR: 0.990 CI: 0.985 - 0.994)
- Where high density of RE within 2.5km
  - (OR: 0.987 CI: 0.981 - 0.992)

These variables were run in separate models because they were strongly correlated.

NO relationship with distance to nearest or FF/HF ratio.
Preliminary Conclusions

Probability of being obese is **lower** where high density of food options within 2.5km

- Perhaps the greater range of food outlets close by means more healthy options are chosen?
- Perhaps people walk more to get food?

**Limitations:**

- Only ~7% of variation in obesity accounted for
- Model fit is OK but not good at determining categories
- Availability of food outlets only plays a small part in predicting obesity (small effect size)
Where next??

- Improving the obesity models
  - Use multiple linear regression
  - Control for more explanatory variables e.g. physical/sedentary activity, individual income, occupation etc

- Sharing information
  - Back to local bodies so they can make informed planning decisions
Thankyou

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