HEALTHY EATING AND THE NEIGHBOURHOOD FOOD ENVIRONMENT IN RICHMOND, BC

my Health my Community

Retail food environments are gaining attention as important determinants of what people eat.[1] The food environment is determined by how close people live to different kinds of food outlets, such as grocery stores or fast food restaurants, as well as the density and variety of those food outlets within the neighbourhood.[2] Evidence suggests that proximity to, and concentrations of some outlets, such as fast food restaurants, are associated with increased prevalence of obesity.[3-10] Meanwhile, cooking frequently at home has been associated with a healthier diet.[11]

Data from the My Health My Community (MHMC) Survey, conducted in 2013-2014 across the Vancouver Coastal Health and Fraser Health regions, can help us understand what residents eat. A key marker of healthy eating is fruit and vegetable consumption, which is strongly associated with positive health outcomes, such as reduced risk of cardiovascular disease, cancer and all cause mortality.[12] Data from MHMC show that only 21% of residents from Richmond, BC report eating 5 or more daily servings of fruits and vegetables, while 25% of Metro Vancouver area residents do. This analysis looks at a relationship between the neighbourhood food environment and both food intake and body mass index (BMI)* in Richmond.

KEY MESSAGES

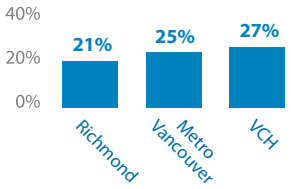
THE FURTHER AWAY PEOPLE LIVE FROM LESS HEALTHY FOOD RETAIL, THE **MORE LIKELY THEY ARE TO EAT 5+ SERVINGS OF FRUITS AND VEGETABLES PER DAY.**

THE GREATER THE DENSITY OF **LESS HEALTHY FOOD RETAIL IN A NEIGHBOURHOOD, THE MORE LIKELY RESIDENTS ARE TO CONSUME SUGARY SNACKS, SUGARY BEVERAGES AND FAST FOOD.**

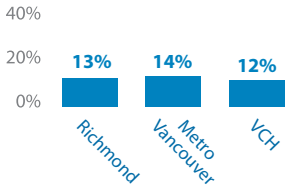
THOSE LIVING IN NEIGHBOURHOODS WITH A **HEALTHIER FOOD ENVIRONMENT** ARE **LESS LIKELY TO HAVE AN OVERWEIGHT OR OBESE BODY MASS INDEX (BMI 25+).**

RICHMOND FOOD INTAKE STATISTICS

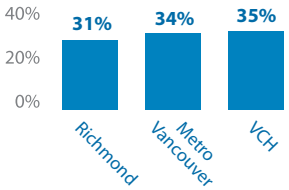
Consume 5+ Servings of Fruit and Vegetables Per Day



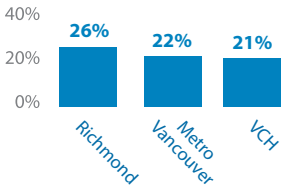
Sugary Beverages 3+ Times Per Week



Sugary Snacks 3+ Times Per Week



Fast food¥ 2+ Times Per Week



* Body mass index (BMI) is a person's weight in kilograms divided by the square of height in meters. BMI can be used as a screening tool for weight category. It is moderately correlated with, but is not diagnostic of, the body fatness or health of an individual.[13]
¥ Eat in or take out meal from a fast food chain.

Vancouver CoastalHealth
Promoting wellness. Ensuring care.

Vancouver CoastalHealth Research Institute
Healthier lives through discovery

METHODS

WHO?

We studied a 2% representative* sample (n=2,618) of the Richmond, BC population aged 18+ years, who responded to the My Health My Community survey (2013-2014). Data for food outlets was obtained from the Vancouver Coastal Health, Environmental Health Information System (2013-2014) that includes all licensed food outlets.

WHAT?

We analyzed the relationship between measures of food access[14] (density, distance, and variety) to different types of food stores, as a proxy for the healthfulness of a food environment, and self-reported food intake and body mass index. Food stores are categorized as "healthier" or "less healthy" (see Food Outlet Definitions on page 3) as a category of health risk. Only statistically significant results are shared in this report.

FOOD ENVIRONMENT EXPOSURE VARIABLES

- The **density** of the food environment was determined by the number of food outlets within a 1km road network threshold between postal code of residence and postal code of the food outlets. The primary indicator in this analysis is 5+ less healthy food retail per 1km.
- The **distance** between residence and a food outlet type was calculated as the distance along a road network between the postal code of residence and the postal code of the nearest of that food retail type.
- The **variety** of the food environment was determined by the **Retail Food Environment Index (RFEI)**, created to measure the healthfulness of the neighbourhood within a 1km buffer along a road network:

$$\text{RFEI} = \frac{\text{\# healthier food outlets X 100}}{\text{(\# healthier + \# less healthy food outlets)}}$$

OUTCOME VARIABLES

- Fruit and vegetable intake: 5+ servings per day
- Fast food intake: 2+ times per week
- Sugary beverage intake: 3+ times per week
- Sugary snack intake: 3+ times per week
- Body mass index

HOW?

Results were derived using multivariate logistic regression adjusted for age, gender, time in Canada, education, and commute mode (work or school). The associations between food environment and food intake and BMI outcomes are measured by odds ratios. An example interpretation of an odds ratio of 1.40: "For every 1km away people live from a limited service food outlet, they have 1.40 times the odds of, or are 40% more likely to, consume 5+ servings of fruits and vegetables per day."

*Responses were weighted using the 2011 National Household Survey data by age, gender, education and neighbourhood.

METHODS

FOOD RETAIL DEFINITIONS€ (NOT MUTUALLY EXCLUSIVE):

Healthier: Grocery stores, green grocers, meat and fish stores.

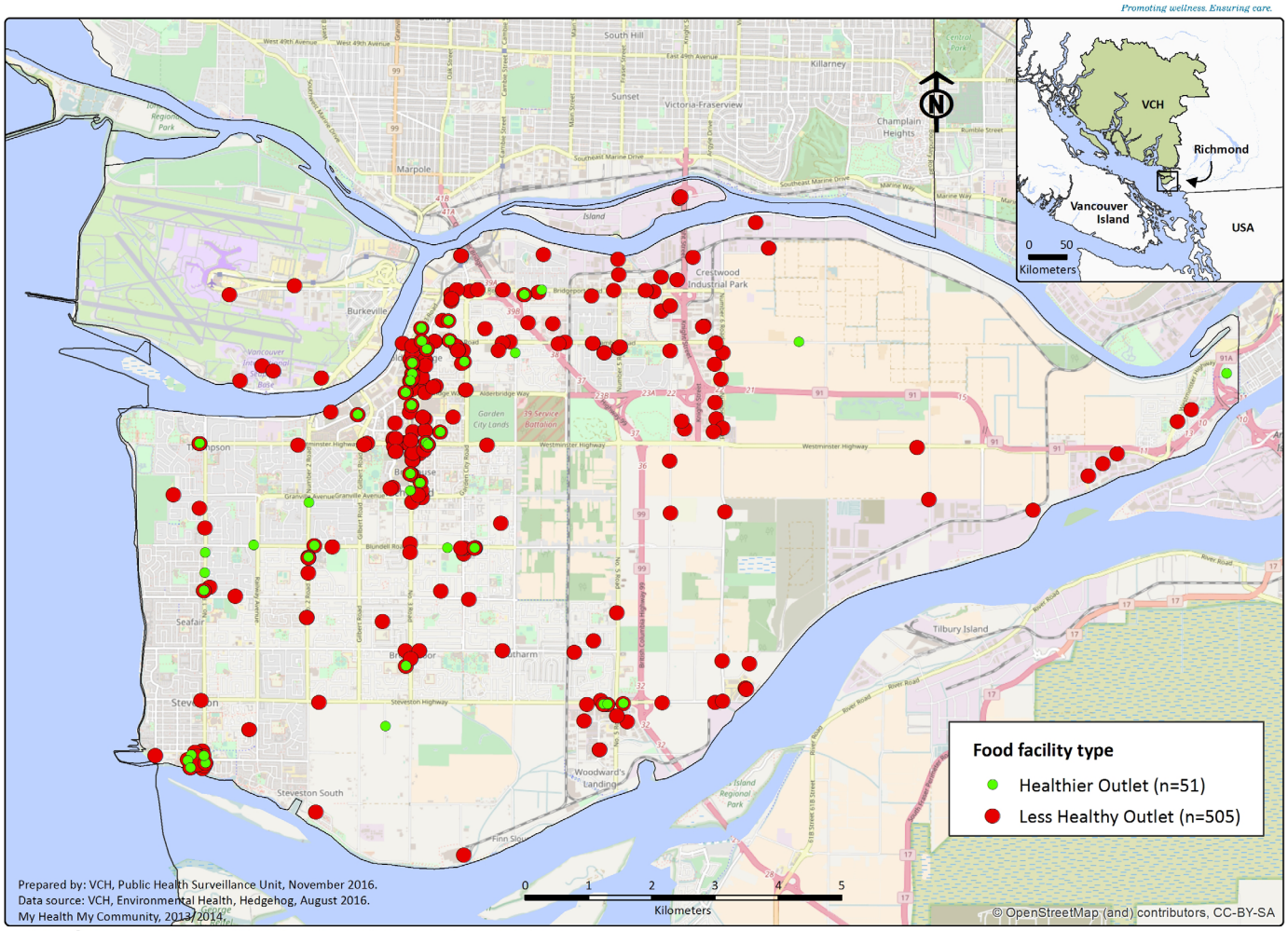
Less Healthy: Convenience stores, gas stations, and limited service retail.

Limited Service: Pay before eating or take out, such as a food bar, cafeteria, food courts, or delivered food by phone.

Fast Food: Quick to buy, cheaper and often high in fat, salt, sugar and calories.

Food Desert: No food retail within 1km of residence.

MAP 1. HEALTHIER AND LESS HEALTHY FOOD OUTLETS IN RICHMOND BETWEEN JUNE 27, 2013 AND JUNE 1, 2014



€ Based on the North American Industry Classification System except for definitions for fast food and food desert.

RESULTS

DENSITY

PEOPLE LIVING IN NEIGHBOURHOODS WITH A HIGH DENSITY OF **LESS HEALTHY FOOD RETAIL** (5+ WITHIN 1KM) ARE:

70%
more likely to consume fast food 2+ times per week (MAP 2)

2.2x
more likely to consume sugary beverages 3+ times per week

THAN PEOPLE LIVING IN NEIGHBOURHOODS WITH NO LESS HEALTHY FOOD RETAIL.

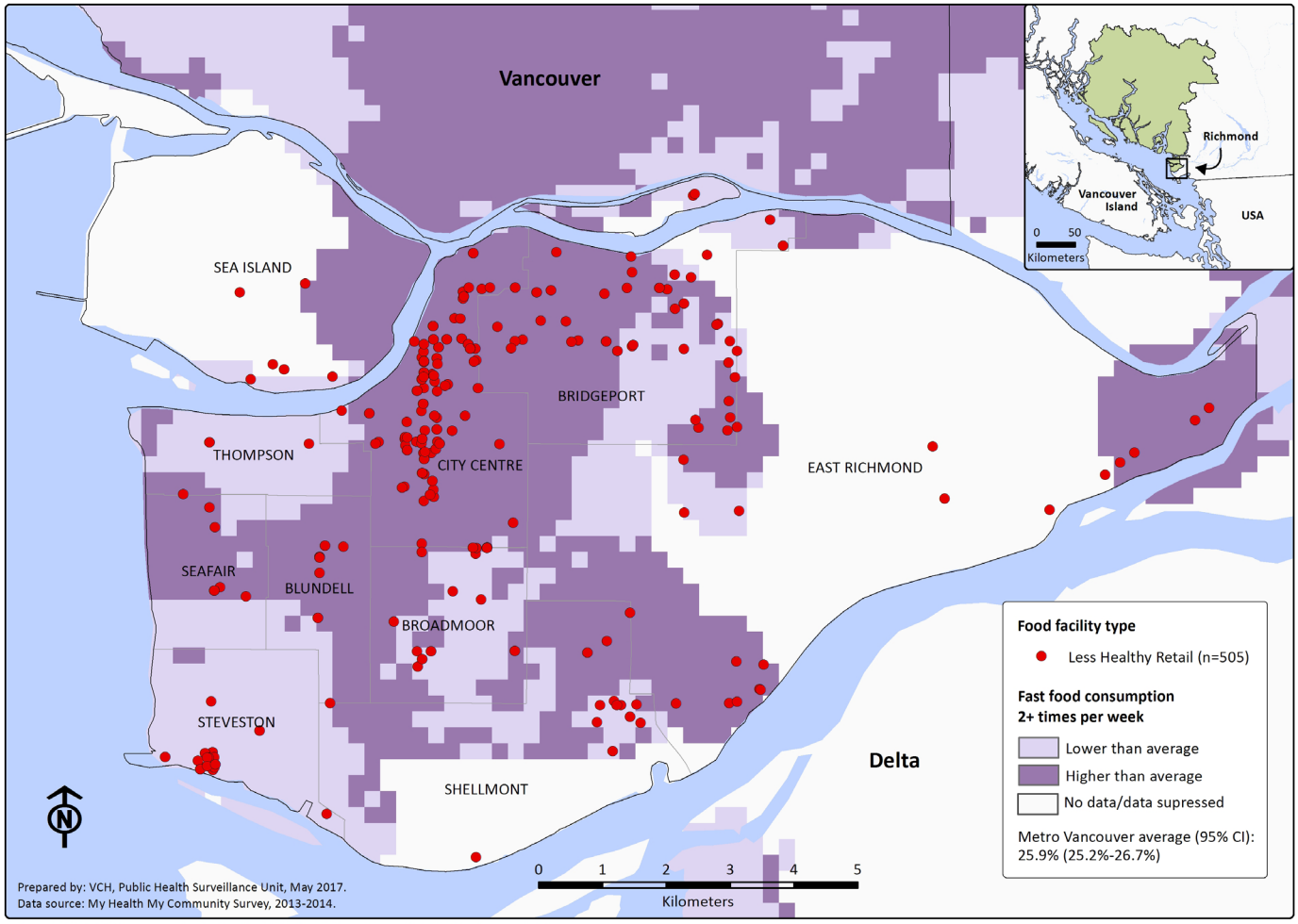
PEOPLE LIVING IN NEIGHBOURHOODS WITH A HIGH DENSITY OF **LIMITED SERVICE FOOD RETAIL** (5+ WITHIN 1KM) ARE:

74%
more likely to consume sugary beverages 3+ times per week

40%
more likely to consume sugary snacks 3+ times per week

THAN PEOPLE LIVING IN NEIGHBOURHOODS WITH NO LIMITED SERVICE FOOD RETAIL.

MAP 2. LESS HEALTHY FOOD RETAIL AND RESPONDENTS WHO REPORTED EATING FAST FOOD 2+ TIMES PER WEEK. MY HEALTH MY COMMUNITY SURVEY, RICHMOND 2013-2014



RESULTS

DISTANCE

PEOPLE LIVING MORE THAN 1KM FROM **LESS HEALTHY FOOD RETAIL** ARE:

56% less likely to consume sugary beverages regularly

42% less likely to eat fast food regularly

THAN THOSE LIVING WITHIN 250M OF LESS HEALTHY FOOD RETAIL.

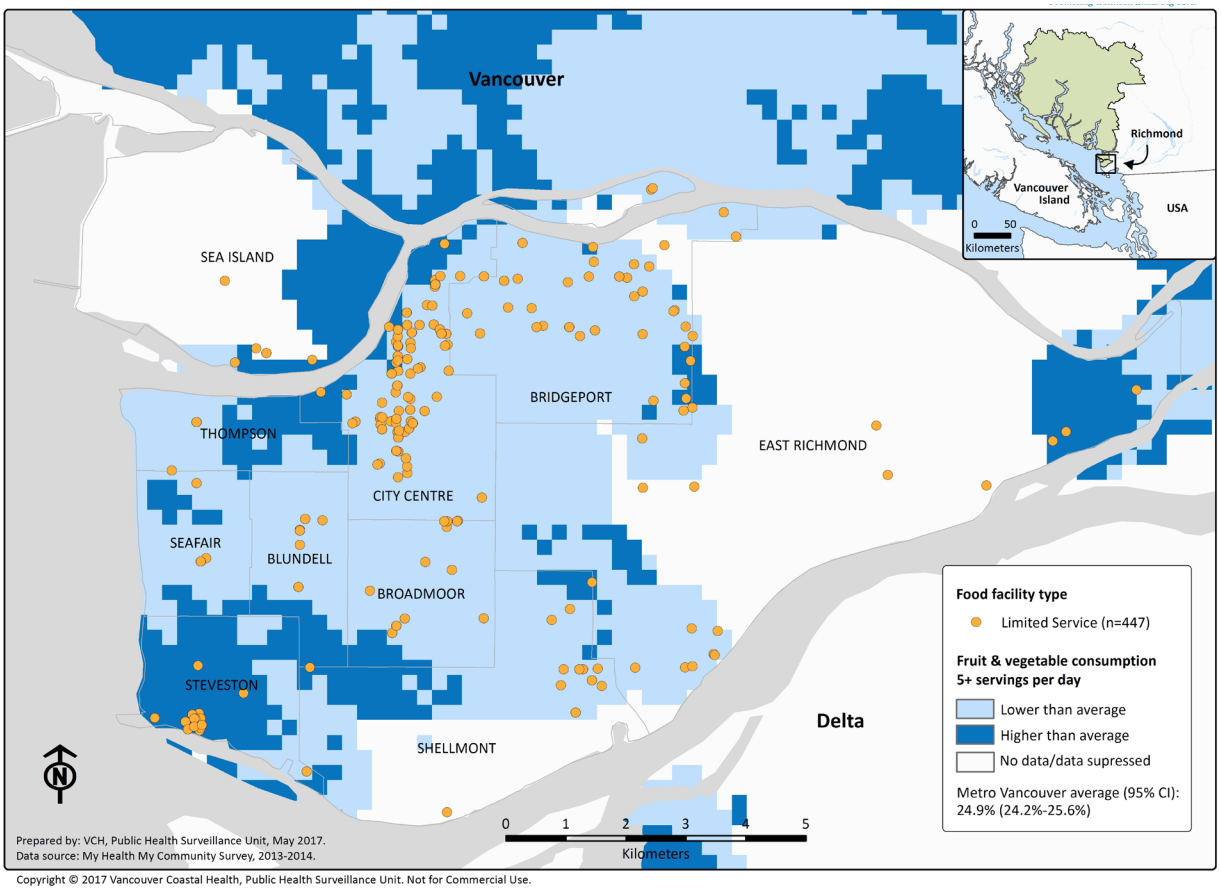
FOR EVERY 1KM AWAY PEOPLE LIVE FROM **LIMITED SERVICE FOOD RETAIL** THEY ARE:

40% more likely to eat 5+ servings of fruit and vegetables per day (Map 3).

FOR EVERY 1KM AWAY PEOPLE LIVE FROM **FAST FOOD RETAIL** THEY ARE:

32% more likely to eat 5+ servings of fruits and vegetables per day.

MAP 3. LIMITED SERVICE FOOD RETAIL AND RESPONDENTS WHO REPORTED EATING 5+ SERVINGS OF FRUIT AND VEGETABLES PER DAY. MY HEALTH MY COMMUNITY SURVEY, RICHMOND 2013-2014



VARIETY

People living in neighbourhoods with a **healthier retail food environment** (RFEI: 60-100) are:

43% **less likely** to have a BMI 25+ than those in less healthy retail food environments (RFEI: 0-10, excluding those in a food desert).

60% **less likely** to have a BMI +25 than those in food deserts (no food retail).

APPENDIX

FOR MORE INFORMATION:

Richmond Community Health Profile, My Health My Community Survey: *https://www.myhealthmycommunity.org/Portals/0/Documents/Community%20Profiles/Richmond_final.pdf*

Food environments: an introduction for public health practice:
http://www.ncceh.ca/sites/default/files/Food_Environments_Public_Health_Practice_Dec_2015.pdf

REFERENCES

1. Minaker LM. Retail food environments in Canada: Maximizing the impact of research, policy and practice. *Can J Public Health.* 2016;107(suppl):eS1-eS3.
2. Rideout K, Mah CL, Minaker LM. Food environments: An introduction for public health practice. National Collaborating Centre for Environmental Health. http://www.ncceh.ca/sites/default/files/Food_Environments_Public_Health_Practice_Dec_2015.pdf. Published December 2015. Accessed June 26, 2018.
3. Black JL, Billette JM. Fast food intake in Canada: differences among Canadians with diverse demographic, socio-economic and lifestyle characteristics. *Can J Public Health.* 2015;106(2):e52-e58.
4. De Vogli R, Kouvonen A, Gimeno D. The influence of market deregulation on fast food consumption and body mass index: A cross-national time series analysis. *Bull World Health Organ.* 2014;92:99-107A.
5. Hollands S, Campbell MK, Gilliland J, Sarma S. Association between neighbourhood fast-food and full-service restaurant density and body mass index: a cross-sectional study of Canadian adults. *Can J Public Health.* 2014;105(3):e172-e178.
6. Kruger DJ, Greenberg E, Murphy JB, DiFazio LA, Youra KR. Local concentration of fast-food outlets is associated with poor nutrition and obesity. *Am J Health Promot.* 2014;28(5):340-343.
7. Stark JH, Neckerman K, Lovasi GS, et al. Neighbourhood food environments and body mass index among New York City adults. J Epidemiol Community Health. 2013;67:736-742.
8. Li F, Harmer P, Cardinal B, Bosworth M, Johnson-Shelton D. Obesity and the built environment: Does the density of neighbourhood fast-food outlets matter? *Am J Health Promot*. 2009;23(3):203-209.
9. Spence JC, Cutumisu N, Edwards J, Raine KD, Smoyer-Tomic K. Relation between local food environments and obesity among adults. *BMC Public Health.* 2009;9(1):192.
10. Scourboutakos M J, Semnani-Azad Z, L'Abbe MR. Restaurant meals: Almost a full day's worth of calories, fats, and sodium. *JAMA Intern Med.* 2013;173(14):1373-1374.
11. Wolfson JA, Bleich SN. Is cooking at home associated with better diet quality or weight-loss intention? *Public Health Nutr.* 2015;18(08):1397-1406.
12. Aune D, Giovannucci E, Boffetta P, et al. Fruit and vegetable intake and the risk of cardiovascular disease, total cancer and all-cause mortality—a systematic review and dose-response meta-analysis of prospective studies. *Int J Epidemiol.* 2017;46(3): 1029-1056
13. About Adult BMI. Centers for Disease Control and Prevention. https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html. Updated August 29, 2017. Accessed June 27, 2018.
14. Minaker LM, Fisher P, Raine KD, Frank LD. Measuring the food environment: From theory to planning practice. *J Agric Food Syst Community Dev.* 2011;2(1):65-82.