

# Food Costing in BC 2017:

Assessing the affordability of healthy eating



**BC Centre for Disease Control**

An agency of the Provincial Health Services Authority

## Prepared for the BC Centre for Disease Control (BCCDC)

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# Table of contents

Executive summary . . . . .	1
Introduction . . . . .	3
Food costing in BC 2017 . . . . .	3
The National Nutritious Food Basket . . . . .	3
Household food insecurity . . . . .	4
Methods . . . . .	6
Findings . . . . .	7
Monthly cost of a nutritious food basket . . . . .	7
Changes in food costs . . . . .	13
Costing difference with and without inclusion of high-end “health food” grocery stores . . . . .	14
Discussion . . . . .	15
Limitations . . . . .	15
Conclusion . . . . .	17
Appendix 1 . . . . .	18
Maps of food costs for each health authority at the HSDA level . . . . .	18
References . . . . .	23



# Executive summary

Sufficient, safe and nutritious food is critical to the health and well-being of British Columbians. A food security indicator for British Columbia (BC) is the average monthly cost of a nutritionally adequate, balanced diet as a proportion of household income. Obtaining a healthy diet is harder for some households than others and food costing data can help determine the affordability of healthy eating for different populations. Food affordability information is valuable for population and public health planning, monitoring and to inform policy.

Every two years, the British Columbia Centre for Disease Control (BCCDC), a part of Provincial Health Services Authority (PHSA), works with the five regional health authorities and key stakeholders such as the Ministry of Health and Dietitians of Canada to monitor the cost of a nutritionally adequate diet in British Columbia (BC). This document presents the 2017 data on the average monthly cost of a nutritionally adequate, balanced diet in BC based on the National Nutritious Food Basket (NNFB) and provides insight into the effects of household food insecurity on individuals and families.

The purpose of this report is to provide data to assess food affordability – the amount of income required for individuals and families to eat a nutritionally adequate diet.

## Methods

In BC, data is collected every two years using Health Canada's NNFB tool, which includes 67 food items that are minimally processed, require preparation and are considered to be commonly eaten by most Canadians in amounts that provide a nutritionally adequate, balanced diet. Data collection is implemented by the regional health authorities (RHAs) and occurs in the last week of May and the first week of June. A sample of 254 full-service grocery stores were randomly selected and stratified by the health service delivery areas (HSDAs) of the RHAs. Complete data for 245 stores was obtained and used to determine the average cost of the NNFB.

The surveillance team at BCCDC analyzed the data submitted by the RHAs using algorithms and information developed by Health Canada on the NNFB. The average cost in each food category is weighted by purchase popularity and the amount of food that each person needs, adjusted by sex and age.

## Findings

### Monthly cost of a nutritious food basket

The average monthly cost of a nutritious food basket for a reference family of four in British Columbia and in each of the five RHAs in 2017 is presented in Table 1.



**Table 1. Average monthly cost of the nutritious food basket for a reference family of four across the BC health authorities in 2017**

	Average Monthly Cost 2017	Number of Stores Sampled 2017
British Columbia	\$1,019	245
Northern Health	\$1,038	23
Island Health	\$1,043	41
Fraser Health	\$982	82
Interior Health	\$1,019	43
Vancouver Coastal Health	\$1,056	56

Also, the monthly costs for each of BC's HSDAs were calculated and ranged from \$912 in the Northeast HSDA (Northern Health) to \$1,184 in the Northwest HSDA (Northern Health).

## Changes in food costs

The average monthly cost of the 2017 nutritious food basket for a reference family of four, \$1,019, shows an increase of \$45/month between 2015 and 2017. The cost of a nutritionally adequate diet increased in all of the health authorities.

## Discussion

In 2017, the average monthly cost of a nutritious food basket for a reference family of four in BC is **\$1,019**. Information on food costs alone has little meaning; the purpose of the food costing data is to assess the affordability of an adequately healthy diet for different population groups in the province. When the cost of a healthy diet is compared to income, the information shows that rising costs of an adequately healthy diet have the biggest impact on those who have the hardest time affording healthy food due to inadequate income. Inadequate or insecure income to purchase food is described as household food insecurity.

Household food insecurity is recognized as a key public health issue in BC as it affects an individual's physical, social and mental health and overall well-being.

## Conclusions

The results show that the monthly cost of an adequately nutritious diet is \$1,019 in BC. This data can be used to assess the affordability of a healthy diet for different population groups and to provide insight into the challenges food insecure households face in order to purchase a healthy diet. Research shows that the strongest predictor of household food insecurity is not price itself, but household income.

# Introduction

## Food costing in BC 2017

Sufficient, safe and nutritious food is critical to the health and well-being of British Columbians. A food security indicator for British Columbia (BC) is the average monthly cost of a nutritionally adequate, balanced diet as a proportion of income – this is referred to as food affordability. When assessing food affordability, it is clear that households with the lowest income have the hardest time affording healthy food.

Every two years, the British Columbia Centre for Disease Control (BCCDC), a part of Provincial Health Services Authority (PHSA), works with the five regional health authorities and key stakeholders such as the Ministry of Health and Dietitians of Canada to monitor the cost of a nutritionally adequate diet in British Columbia (BC). The food costing data can be used to assess the affordability of a healthy diet for different populations groups, which can be used for population and public health planning and monitoring and to inform policy.

The purpose of this document is to present the 2017 data on the average monthly cost of a nutritionally adequate, balanced diet in BC, based on the National Nutritious Food Basket and to present the latest research on the connections between household food insecurity (the inability to afford a healthy diet) and overall health. This document outlines the methods taken to collect and analyze the data and the results; it discusses the health implications of not being able to afford a healthy diet; it compares the 2017 data to previous years' data; and it discusses the findings.

## The National Nutritious Food Basket

The National Nutritious Food Basket (NNFB) was first introduced at a national level in 1974. The Food Prices Review Board developed the tool and Agriculture and Agri-Food Canada implemented it in cities across Canada until 1995. In 1997, Health Canada assumed responsibility for the tool and updated it based on data from Statistics Canada, the Canadian Nutrient File and Canadian nutrition recommendations. In 2008, the NNFB was revised once more to reflect the Dietary Reference Intakes, the updates to Eating Well with Canada's Food Guide and the data collected through the Canadian Community Health Survey (CCHS).<sup>1</sup>

Calculating the cost of the NNFB provides insight into the income required for individuals and families to be able to eat a nutritionally adequate diet.

The NNFB tool is used by provinces and territories across Canada to monitor the cost and affordability of healthy eating. For example, the Ontario Public Health Standards require health boards across Ontario to monitor food affordability on an annual basis.<sup>2</sup>

The NNFB includes 67 food items that are minimally processed, require preparation and are considered to be commonly eaten by most Canadians in amounts that would provide a nutritionally adequate, balanced diet. The NNFB does not consider special dietary needs, cultural or other food preferences, non-food items, take-out food or condiments, spices or kitchen equipment and utensils.

## Household food insecurity

A key indicator of food insecurity in BC is an individual's or household's ability to afford healthy, safe and culturally appropriate food. Calculating the cost of the NNFB provides insight into the income required for individuals and families to be able to eat a nutritionally adequate diet.

Health Canada defines household/individual food insecurity as “the inability to acquire or consume an adequate diet quality or a sufficient quantity of food in socially acceptable ways or the uncertainty that one will be able to do so”<sup>3</sup>, which is most often due to lack of financial resources to access food.<sup>4</sup> More recently, a leading group of researchers in Canada defines household food insecurity as “the inadequate or insecure access to food due to financial constraints”.<sup>5</sup>

Household food insecurity ranges from worrying about running out of food (marginal food insecurity), to not being able to afford healthy food (moderate food insecurity) and to missing meals or going hungry (severe food insecurity). In 2012 (our most recent data for BC), 12.7% or 485,000 people of the BC population was food insecure: 3.2%, 5.7% and 3.8% experiencing severe, moderate and marginal food insecurity respectively.<sup>6</sup> Higher rates of food insecurity are found in lower income households and among: families headed by single females, Indigenous Peoples, marginally housed and homeless people and new immigrants.<sup>7</sup>

Food insecurity affects individual health and healthcare costs. A 2015 study in Ontario shows that as the severity of food insecurity rises, so too does utilization of health care services. In Ontario, the health care costs are 16% higher for marginally food insecure and 76% higher for severely food insecure households compared to food secure households.<sup>8</sup> In addition, a 2018 study found the economic burden of not meeting healthy eating recommendations is approximately \$13.8 billion per year in Canada (\$5.1 billion of which is associated directly with health care costs and \$8.7 billion is associated with indirect costs such as lost productivity).<sup>9</sup> Food insecurity contributes to this economic burden as those who are food insecure cannot afford to meet their basic dietary needs.

As reported in the Ministry of Health's document the Core Functions Food Security Evidence Review,<sup>10</sup> food security is foundational to healthy eating and for those households that are food insecure, there are a number of health and social challenges that may arise:

## Birth outcomes and maternal health

- Inadequate nutrition during pregnancy can have negative health impacts on both the mother and baby. For example, low-income women who are unable to meet their dietary requirements during pregnancy have an increased risk for a low birth weight baby.<sup>11</sup>

- Mothers living in food insecure households were as likely to initiate breastfeeding as mothers who were food secure, but food insecure mothers were less able to sustain exclusive breastfeeding for as long as mothers living in food secure households.<sup>12</sup>
- Among food insecure families, the quality and quantity of women's food intake may deteriorate as household incomes dwindle.<sup>13</sup>

## Chronic diseases

- Food insecure individuals report higher levels of: poor or fair self-rated health, diabetes, heart disease, high blood pressure and food allergies.<sup>14-16</sup>
- Food insecure individuals with diabetes experience greater emotional distress around successful diabetes self-management, have a harder time managing their blood sugars and following a diabetic diet due to precarious food access.<sup>17</sup>
- Youth who experience hunger are more likely to have a chronic condition and asthma.<sup>18</sup>
- Food insecure children have poorer general health.<sup>18</sup>

## Mental health and emotional well-being

- Food insecurity impacts social and mental well-being and can increase the likelihood of depression, distress (including feelings of worthlessness and hopelessness) and social isolation.<sup>15,19,20</sup>
- Child hunger is an independent risk factor for depression and suicidal symptoms in adolescence and early adulthood.<sup>20,21</sup>
- Food insecure children may have poorer academic outcomes and social skills compared to children who do not experience food insecurity.<sup>23,24</sup>



# Methods

In BC, data is collected every two years, during the last week of May and the first week of June, by the five regional health authorities. Health Canada's NNFB tool is used to collect the cost and the same tool is used each year to facilitate comparison. From 2009-2013, data was collected and analyzed at the regional health authority (RHA) level and food costs from approximately 130 randomly selected, full-service grocery stores were used to determine the average cost of the 67 food items.

Since 2015, data collection and analysis includes all 16 health service delivery areas (HSDA) to address the RHAs' request for more local-level data.<sup>i</sup> In 2017, BCCDC randomly selected a sample of 254 full-service grocery stores stratified by the HSDAs of the RHAs. BCCDC received complete data for 245 stores, which was used to determine the average cost of the NNFB.

The surveillance team at BCCDC analyzed the data submitted by the regional health authorities using algorithms and information developed by Health Canada on the NNFB. The average cost in each food category was weighted by purchase popularity and the amount of food that each person needs, adjusted by sex and age. Then the total cost was adjusted based on the size of family, using the household size adjustment factor, to account for the economies or diseconomies of scale.

<sup>i</sup> The 2017 food costing also included three local health areas (LHA) in each health authority. This information is available from the regional health authorities.

# Findings

## Monthly cost of a nutritious food basket

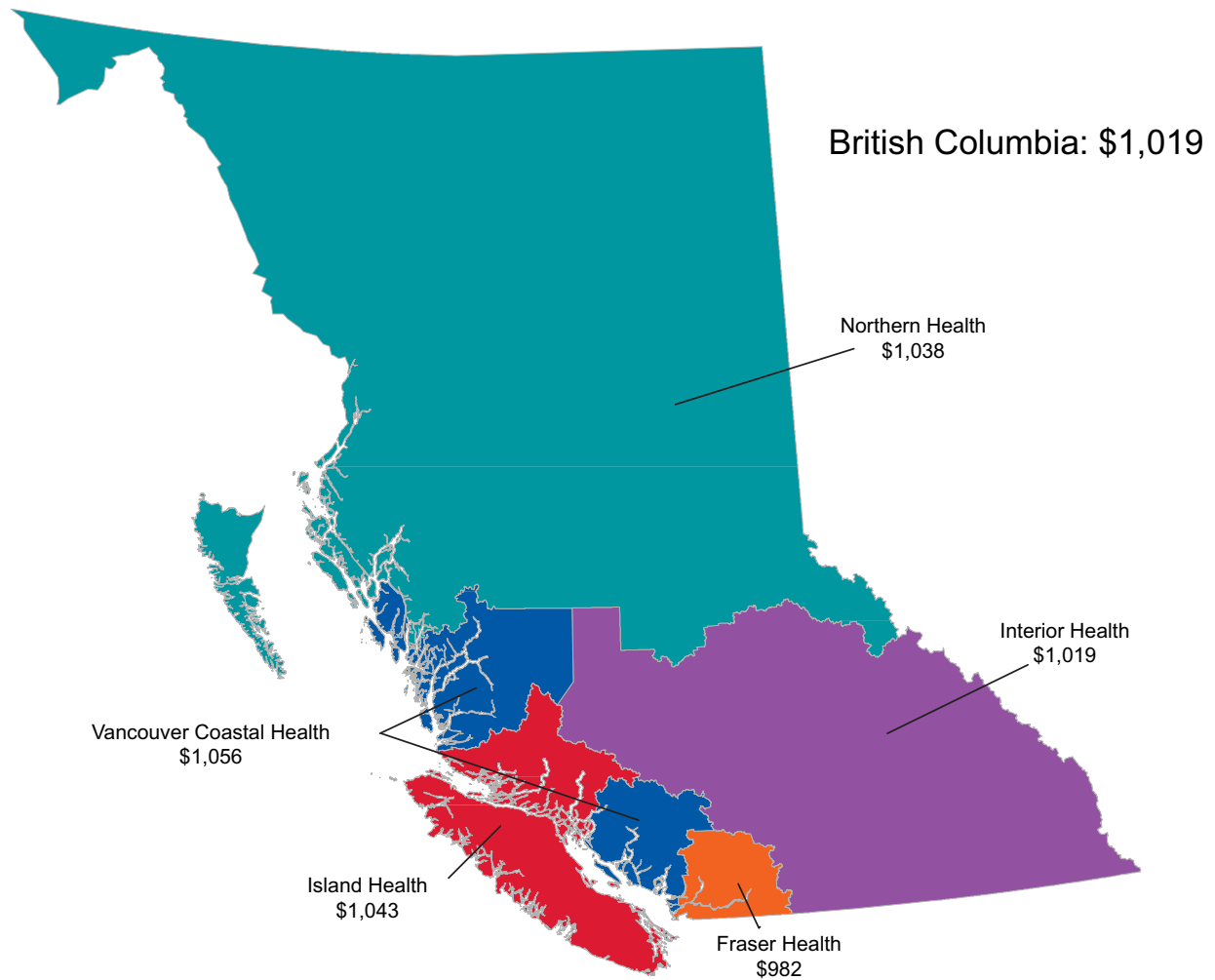
The average monthly cost of a nutritious food basket for a reference family of four in British Columbia in 2017 is **\$1,019**. The monthly food cost we derived is based on a reference family of four, which is made up of a male and female (age 31-50), a boy (14-18 years old) and a girl (4-8 years old).

The average monthly cost of a nutritious food basket for a reference family of four across the health authorities is presented in Table 1 and is graphically displayed in Figure 1. There is some variation in average monthly cost by health authority: the highest cost is in Vancouver Coastal Health (\$1,056) and the lowest cost is in Fraser Health (\$982).

**Table 1. Average monthly cost of the nutritious food basket for a reference family of four across the BC health authorities in 2017**

	Average Monthly Cost 2017	Number of Stores Sampled 2017
British Columbia	\$1,019	245
Northern Health	\$1,038	23
Island Health	\$1,043	41
Fraser Health	\$982	82
Interior Health	\$1,019	43
Vancouver Coastal Health	\$1,056	56

Figure 1. Average monthly cost of the nutritious food basket for a reference family of four across the BC health authorities in 2017



Data Source: BC Nutritious Food Basket Food Costing Survey, 2017

The average monthly cost of a nutritious food basket for a reference family of four across the BC HSDAs is presented in Table 2. Figure 2 shows the geographical location of each of the HSDAs. Maps showing the average monthly food cost for each of the five regional health authorities by their HSDA are presented in Appendix 1.

**Table 2. Monthly food costs for each health services delivery area for a reference family of four in 2017**

	Average Monthly Cost 2017	Number of Stores Sampled 2017
<b>Fraser Health</b>		
Fraser East	\$959	14
Fraser North	\$985	31
Fraser South	\$989	37
<b>Interior Health</b>		
East Kootenay	\$1,002	7
Kootenay Boundary	\$1,090	8
Okanagan	\$1,020	17
Thompson Cariboo	\$979	11
<b>Northern Health</b>		
Northeast	\$912	8
Northern Interior	\$992	6
Northwest	\$1,184	9
<b>Vancouver Coastal Health</b>		
North Shore/Coast Garibaldi	\$1,038	19
Richmond	\$978	9
Vancouver	\$1,093	28
<b>Island Health</b>		
Central Vancouver Island	\$1,029	14
North Vancouver Island	\$1,036	9
South Vancouver Island	\$1,057	18

Figure 2. Locations of the 16 HSDAs across BC



The cost of the nutritious food basket is reported based on a reference family of four (two parents and two children). Table 3 shows the calculation for the reference family of four.

**Table 3. Calculation of the 2017 nutritious food basket for a reference family of four in BC**

Gender	Age	Average Monthly Cost
Female	4 – 8 years	\$167
Male	14 – 18 years	\$323
Female	31 – 50 years	\$243
Male	31 – 50 years	\$286
Subtotal		\$1,019
Multiply by the household adjustment factor for a family of four		X 1.0
<b>Total cost</b>		<b>\$1,019</b>

Information in Tables 5 and 6 (page 12) can be used to calculate the cost of a nutritious food basket for different family types. Because it costs more per person to feed a smaller family and less to feed a larger family, the household size adjustment factors found in Table 6 must be applied to the total cost. An example of how to calculate the cost of a nutritious food basket using the household size adjustment factor for a single mother with one son is provided in Table 4.

**Table 4. Calculation of the 2017 nutritious food basket for a single mom and her son in BC**

Gender	Age	Average Monthly Cost
Female	35 years	\$243
Male	12 years	\$227
Subtotal		\$470
Multiply by the household adjustment factor for a family of two		X 1.10
<b>Total cost</b>		<b>\$517</b>

**Table 5. Average monthly cost of the 2017 nutritious food basket in BC for different age and gender groups**

Males	Average Monthly Cost	Females	Average Monthly Cost
<b>Age Group</b>		<b>Age Group</b>	
2 - 3 years	\$134	2 - 3 years	\$131
4 - 8 years	\$172	4 - 8 years	\$167
9 - 13 years	\$227	9 - 13 years	\$195
14 - 18 years	\$323	14 - 18 years	\$234
19 - 30 years	\$316	19 - 30 years	\$246
31 - 50 years	\$286	31 - 50 years	\$243
51 - 70 years	\$275	51 - 70 years	\$212
Over 70 years	\$272	Over 70 years	\$208
		<b>Pregnancy</b>	
		Younger 18 years	\$261
		19 - 30 years	\$266
		31 - 50 years	\$259
		<b>Breastfeeding</b>	
		Younger 18 years	\$271
		19 - 30 years	\$282
		31 - 50 years	\$276

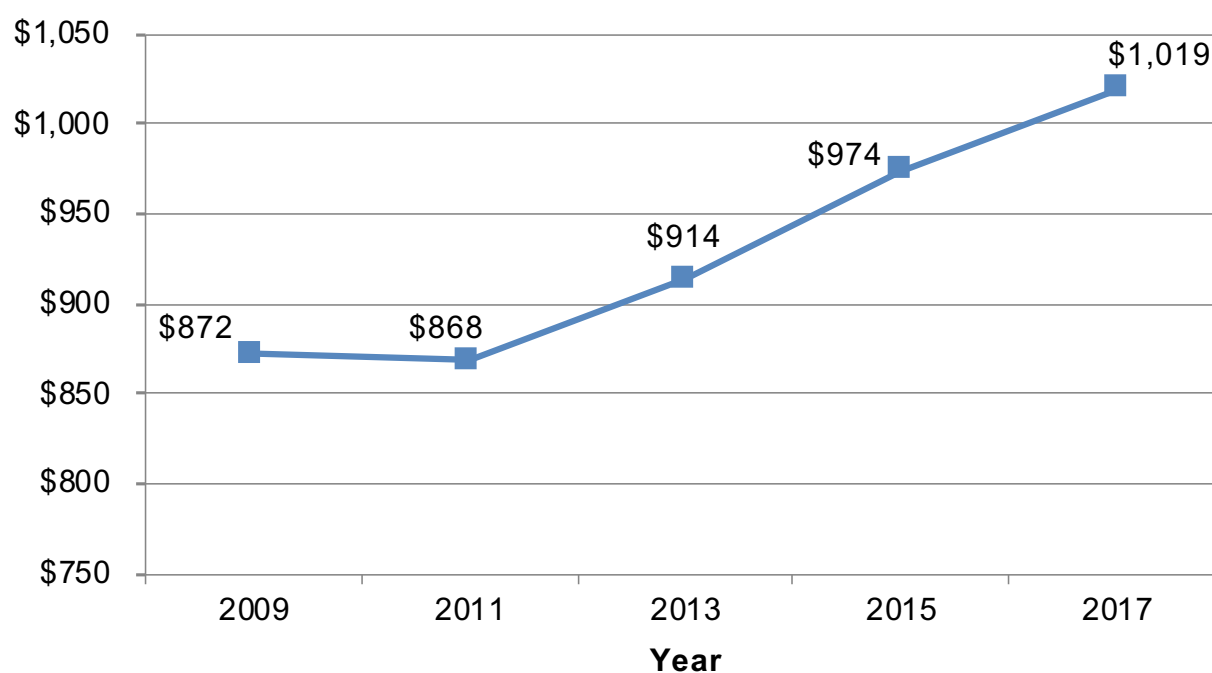
**Table 6. Household size adjustment factors**

Family Size	Adjustment Factor
Individual	Multiply by 1.20
Two people	Multiply by 1.10
Three people	Multiply by 1.05
Four people	Multiply by 1.0
Five to six people	Multiply by 0.95
Seven or more people	Multiply by 0.90

## Changes in food costs

The average monthly cost of the 2017 nutritious food basket for a reference family of four is \$1,019, which shows an increase of \$45/month between 2015 and 2017. Changes in food costs at a provincial level over the last four costing cycles for a reference family of four are included in Figure 3.

**Figure 3. Changes in BC monthly food costs for a reference family of four from 2009-2017**



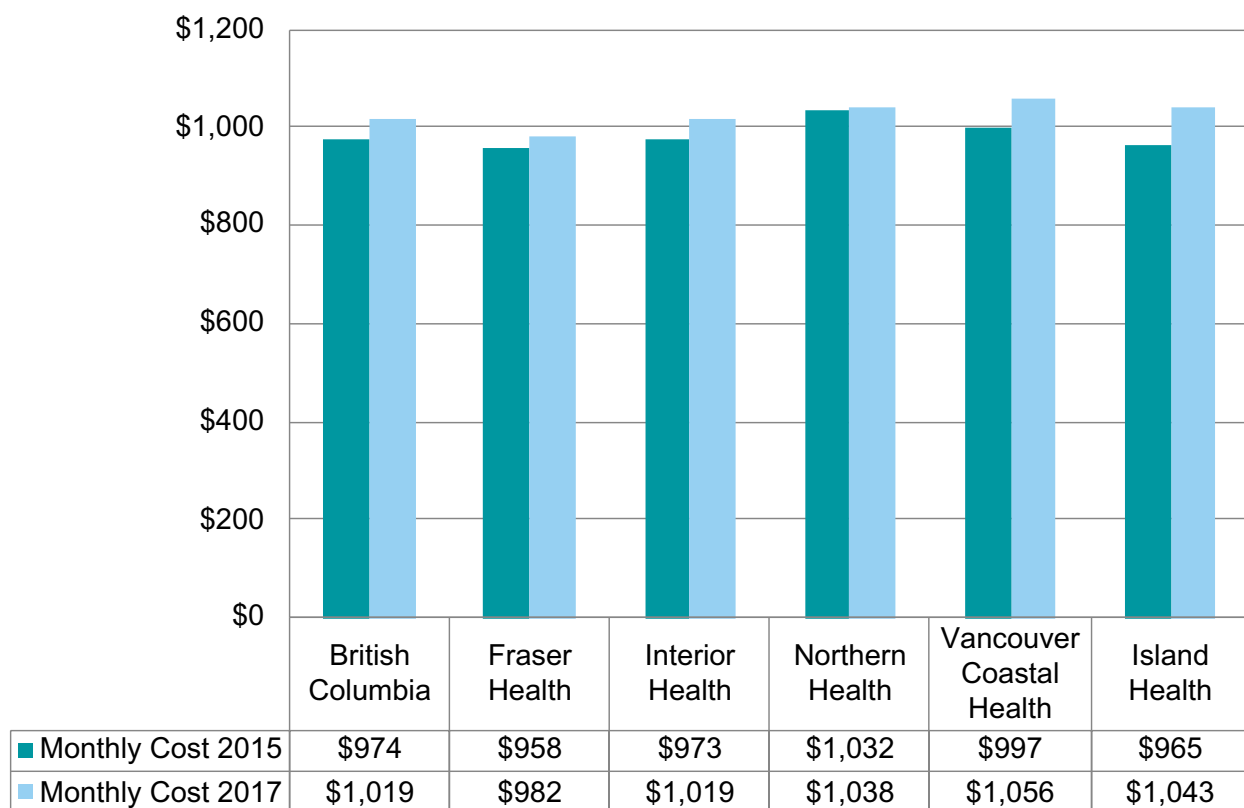
Since 2015, the average monthly cost of the NFB increased in all five of the RHAs. The greatest absolute change in 2017 was \$78 in Island Health followed by \$59 in Vancouver Coastal Health. The change in average monthly food costs for each RHA are included in Table 7 and are graphically presented in Figure 4.

**Table 7. The change in monthly food costs for BC and each RHA for a reference family of four from 2015 and 2017**

	Average Monthly Cost 2015	Average Monthly Cost 2017	Number of Stores Sampled 2017	Absolute Change
British Columbia	\$974	\$1,019	245	<b>\$45</b>
Northern Health	\$1,032	\$1,038	23	<b>\$6</b>
Island Health	\$965	\$1,043	41	<b>\$78</b>
Fraser Health	\$958	\$982	82	<b>\$24</b>
Interior Health	\$973	\$1,019	43	<b>\$46</b>
Vancouver Coastal Health	\$997	\$1,056	56	<b>\$59</b>



**Figure 4. The change in monthly food costs for B.C. and each health authority for a reference family of four from 2015 to 2017**



## Costing difference with and without inclusion of high-end “health food” grocery stores

Food costing occurs in randomly selected full-service grocery stores, which include high-end “health food” grocery stores (stores which are known to have a high proportion of organic and/or local foods). The inclusion of these stores may disproportionately influence food costs, as they often had multiple items identified as high outliers when looking at the average cost of food items. For example, in the 2017 cycle of food costing, eight out of the 28 stores sampled (29%) in the Vancouver HSDA were high-end “health food” grocery stores, which was higher than in any other HSDA in BC. The monthly average food cost for all sampled stores in the Vancouver HSDA is \$1,093. By excluding the eight high-end “health food” grocery stores, the monthly cost for the Vancouver HSDA decreases by \$140 to \$953. Another example of the impact of high-end “health food” grocery stores is in the South Island HSDA, where the monthly average food cost of all sampled stores is \$1,057 but the exclusion of one high-end “health food” grocery store lowered the monthly average food cost to \$1,007.

# Discussion

In 2017, the average monthly cost of a nutritious food basket for a reference family of four in BC is **\$1,019**. The data presents food costs across the province and shows that food costs are increasing over time; however, food costs and rising food prices have little meaning on their own. Increasing food prices do not affect everyone equally – they have the biggest impact on those with the lowest incomes. Individuals and families earning low wages struggle to find ways to purchase healthy food after meeting their other basic needs. Research consistently shows that the strongest predictor of household food insecurity is not the price of food itself, but household income levels. For this reason, the food costing data is intended to be used to assess food affordability which describes the percentage of income required to purchase an adequately healthy diet compared to different income scenarios. Food costing data is also used in living wage and affordability calculations.

As with all data, there are some limitations to the food costing process (see the section on limitations). For example, the highest food costs in 2017 are in Vancouver Coastal Health (\$1,056), Island Health (\$1,043) and Northern Health (\$1,038). This is a change from 2015 where Northern Health had the highest food cost and Island health had some of the lowest food costs in the province. Some of this change in food costs can be explained by the inclusion of high-end “health food” grocery stores. By excluding the high-end stores from Vancouver Coastal Health and Island Health, the monthly food costs dropped to \$992 and \$1,022 respectively; as a result Northern Health (which did not have any high-end stores) returns to having the highest food costs in BC. The Food Costing Working Group and the Population and Public Health team at BCCDC are considering excluding high-end grocery stores in future food costing cycles. Another factor that may affect food costs is the proportion of larger chain grocery stores, especially those that are known for having lower prices, versus smaller, independent grocery stores.

## Limitations

There are two main sampling limitations: data collection was a one-time snapshot event that may not necessarily reflect the average annual cost estimate and the exclusion of non-full-service grocery stores may influence the estimated costs and may not reflect the cost in remote areas where there are a limited number of full-service grocery stores.

Other limitations include:

- Not everyone shops at full-services stores.
- Rural and remote areas have limited number of full-services stores.
- Transportation costs are not considered for rural and remote communities who may have to travel long distances to access a full-service grocery store.
- The NNFB costing tool is from 2008 and some of the items and/or sizes may no longer represent the current marketplace.
- The Health Canada costing analysis tool is also from 2008 (with revisions in 2009) and may no longer reflect variables such as item popularity.

- When applied to sub-provincial levels, demographic and geographic differences between RHAs/ HSDAs may not be fully captured by the current Health Canada NNFB costing analysis tool. These differences include but are not limited to:
  - Age and sex distribution,
  - Ethnicity/culture,
  - Average family composition,
  - Rural/remoteness vs. urbanity,
  - Seasonality of food items, and
  - Seasonality of sales promotion.
- Inflation rate is not considered when comparing prices over time.
- While a random sample of stores is used, the inclusion of high-end “health food” grocery stores may disproportionately influence the total cost (see discussion on page 15).
- Food costing data collection is completed by health authority’s Registered Dietitians and volunteers whose skills, knowledge of items and precision may vary causing some variation in the data collected.

# Conclusion

Sufficient, safe and nutritious food is critical to the health and well-being of the BC population. Households that are food insecure face numerous health and social challenges. In this report, the National Nutritious Food Basket was used as a tool to assess the cost and affordability of food to better understand the challenges food insecure households face to eat a healthy diet.

In BC, the 2017 average monthly cost of a nutritious food basket for a reference family of four is \$1,019. There is some variation in average monthly cost by health authority and by health services delivery area. This data can be used to assess the affordability of a healthy diet for different population groups and to provide insight into the challenges food insecure households face to purchase a healthy diet.

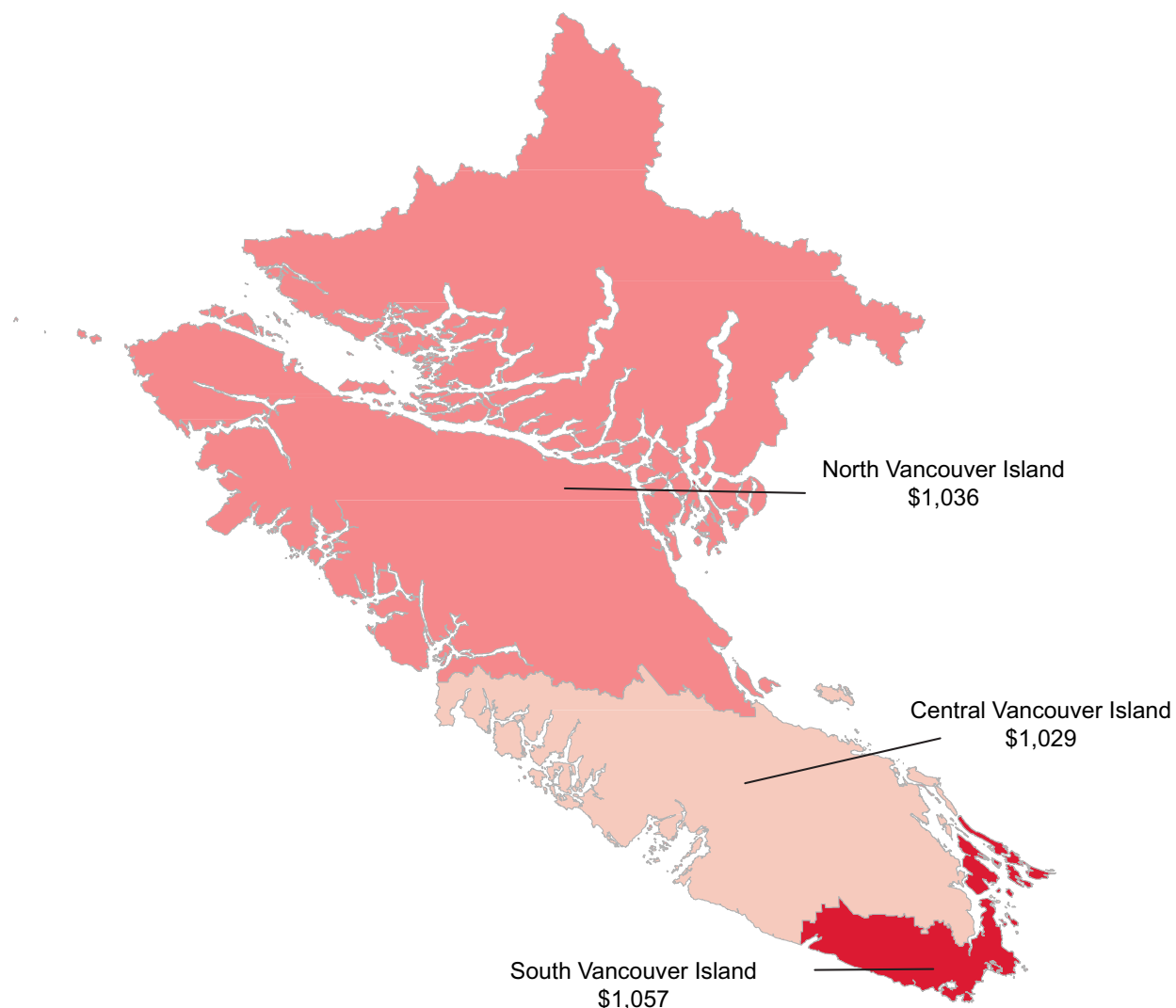
The cost of a healthy diet can affect individuals and families of all incomes but has the highest impact among households with the lowest incomes. Research shows that the strongest predictor of household food insecurity is not food price itself, but household income.

# Appendix 1

## Maps of food costs for each health authority at the HSDA level

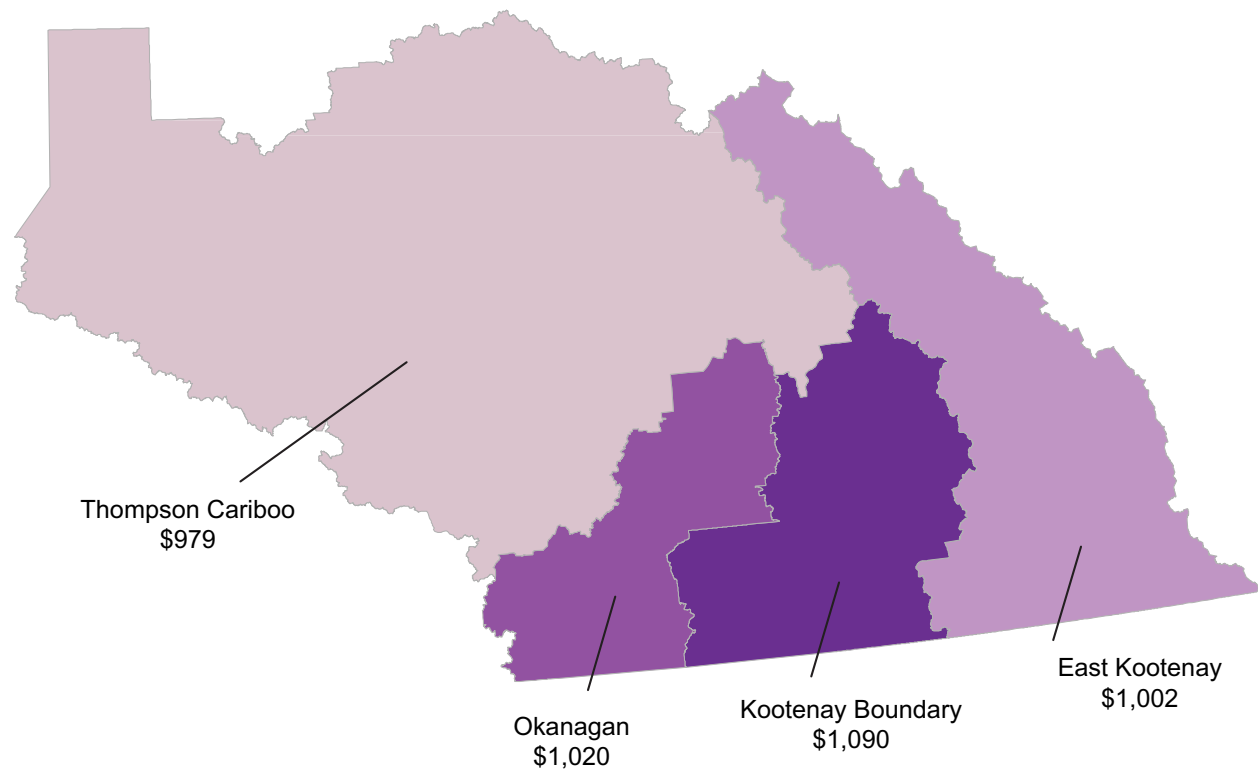
Figures 5-9 show the average monthly cost of a nutritious food basket for a reference family of four across the HSDAs for each of the five regional health authorities.

**Figure 5. Average monthly cost of the nutritious food basket for a reference family of four across the Island Health HSDAs in 2017**



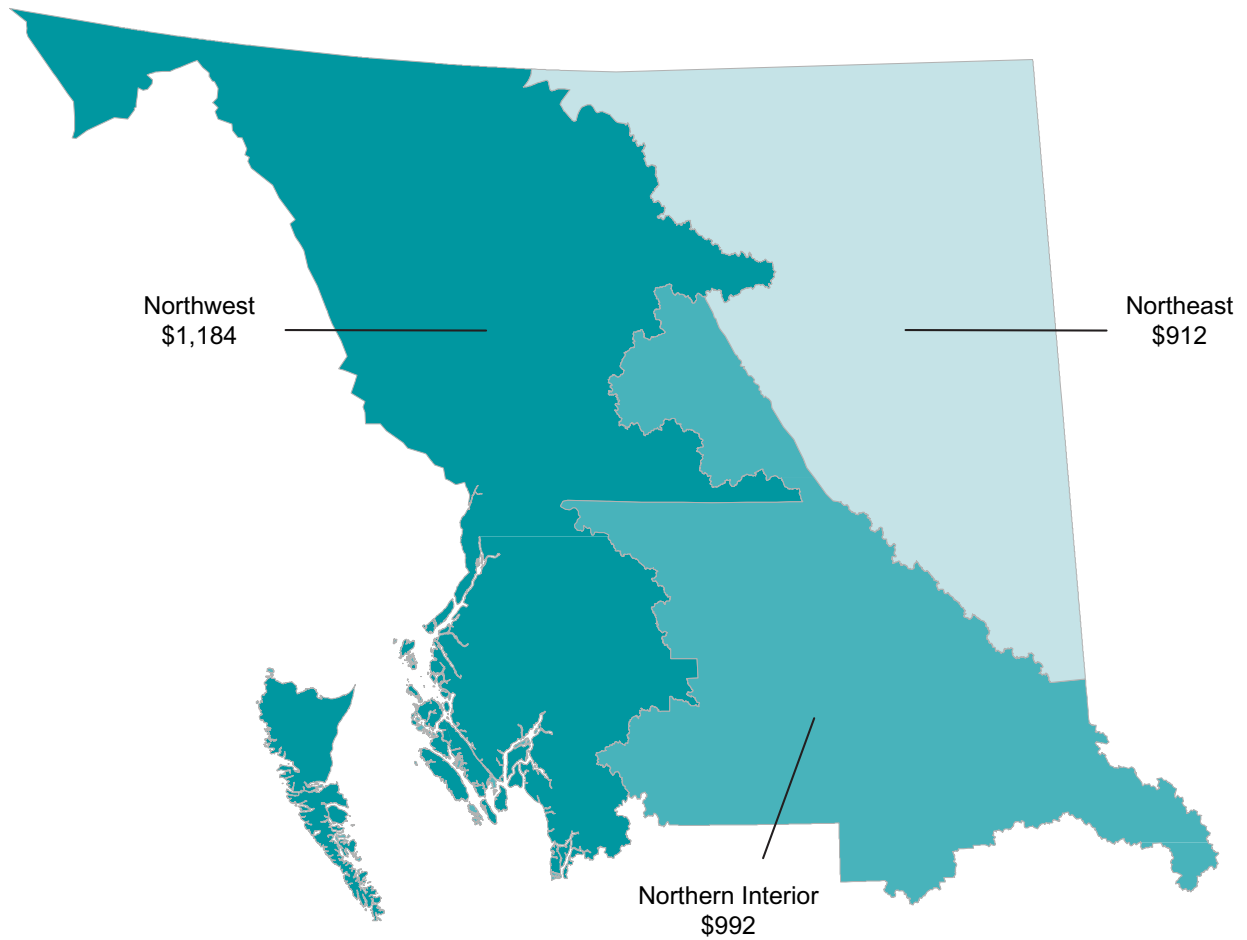
Data Source: BC Nutritious Food Basket Food Costing Survey, 2017

**Figure 6. Average monthly cost of the nutritious food basket for a reference family of four across the Interior Health HSDAs in 2017**



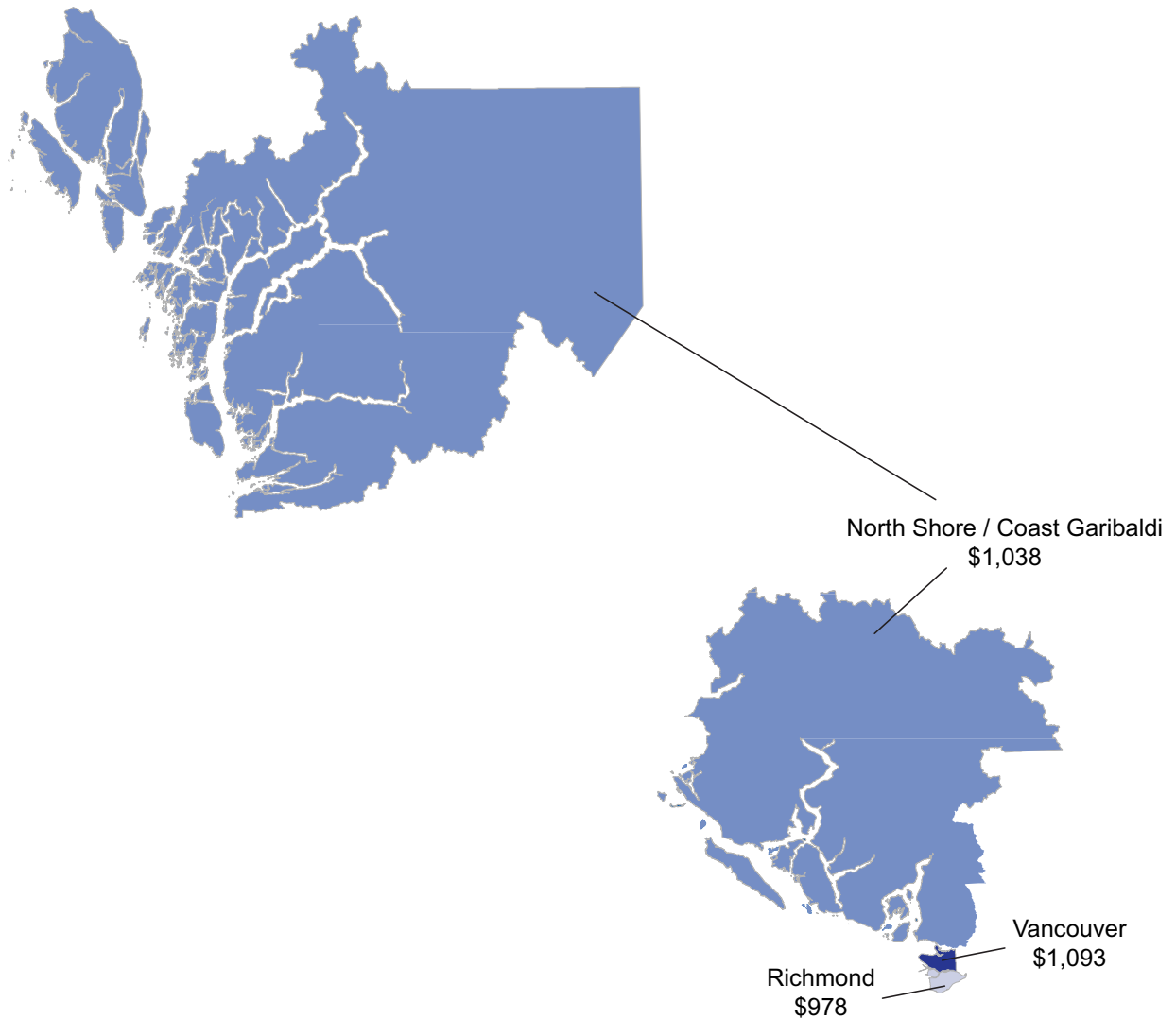
Data Source: BC Nutritious Food Basket Food Costing Survey, 2017

**Figure 7. Average monthly cost of the nutritious food basket for a reference family of four across the Northern Health HSDAs in 2017**



Data Source: BC Nutritious Food Basket Food Costing Survey, 2017

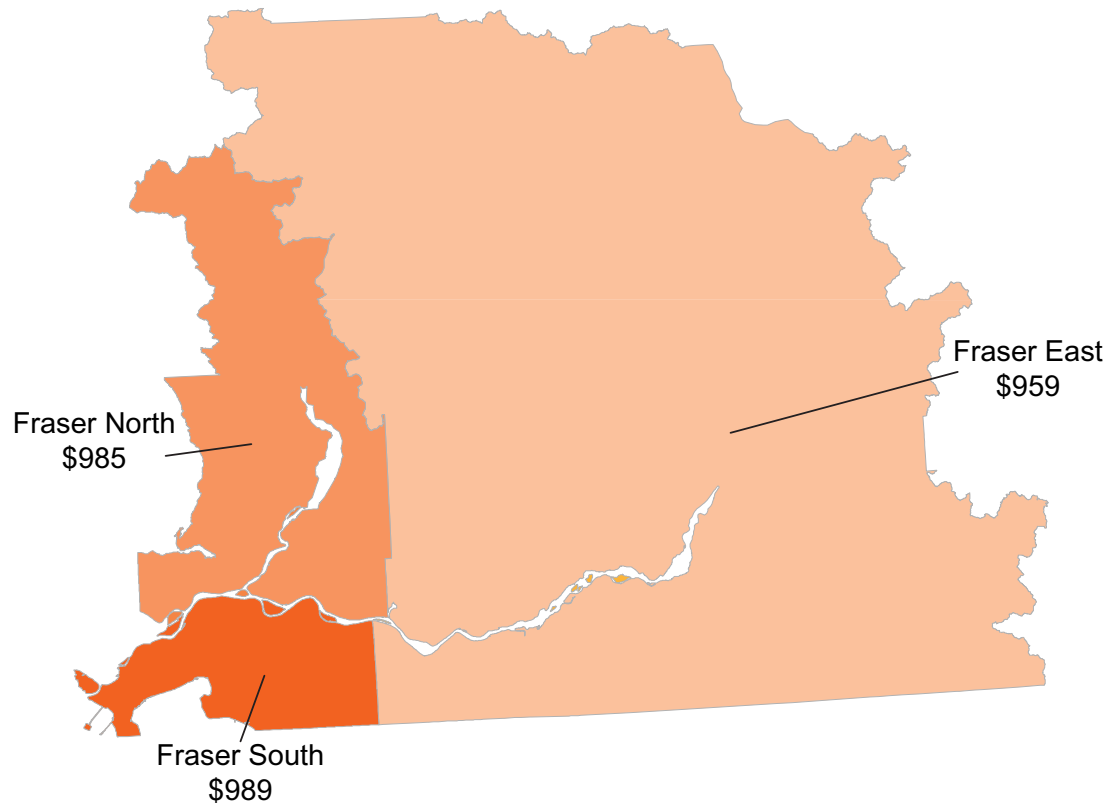
Figure 8. Average monthly cost of the nutritious food basket for a reference family of four across the Vancouver Coastal Health HSDAs in 2017



Data Source: BC Nutritious Food Basket Food Costing Survey, 2017



Figure 9. Average monthly cost of the nutritious food basket for a reference family of four across the Fraser Health HSDAs in 2017



Data Source: BC Nutritious Food Basket Food Costing Survey, 2017

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