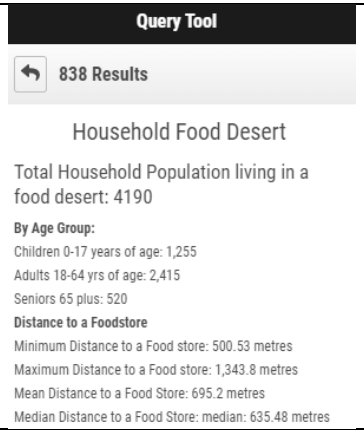
Data Dictionary - Winnipeg Food Atlas 2020

Layer Name	Description	Date Updated
I. MAP LAYERS		
A. CORE CENSUS DATA		
Smart Ward (2016 Census data)	Link to a 2016 Census data report for each City Electoral Ward **Source**: City of Winnipeg	August, 2019
Smart Neighborhood (2016 Census Data)	Link to Census data report for the years 2016 and 2011 for each the 239 Winnipeg Health Region neighborhoods **Source:** City of Winnipeg	August, 2019
B. ADMINISTRATIVE BOUNDARIES		
Community Area Boundary	Community Area (CA) Boundaries used by the Winnipeg Regional Health Authority. There are 12 CAs in the Winnipeg Health Region. CAs are aggregations of Winnipeg neighborhoods. **Source:** Population and Public Health, Winnipeg Regional Health Authority	August, 2019
City Electoral Ward Boundary	There are 14 Electoral Wards in the City of Winnipeg. Wards are aggregations of Winnipeg neighborhoods. **Source:** City of Winnipeg	Oct., 2018
Neighborhood Boundary	Winnipeg Neighborhoods include the City of Winnipeg neighborhoods plus the rural municipalities of East and West St. Paul. **Source:** City of Winnipeg	August, 2019
C. FOOD ASSETS		
Food Banks, Winnipeg Harvest 2019	Food banks locations supported by Winnipeg Harvest. Foodbank locations are allocated to a random location within a neighborhood. Circle size is scaled by maximum number of clients served. **Source:** Winnipeg Harvest	Oct., 2019
Community Gardens	Community garden allotments managed by the City of Winnipeg. This layer does not include non-City managed community garden locations. **Source:** City of Winnipeg	July, 2019
Farmers Markets	Farmers Markets in the Winnipeg Health Region	Nov., 2019

	Source: List created manually by Population and Public Health, Winnipeg Regional Health Authority	
Newcomer Food Stores, Nov. 2019	List of stores carrying foods relevant to Winnipeg's newcomer population. **Source**: Food Matters Manitoba	Oct., 2019
Full Service Grocery Stores	Non-national chain grocery stores (may be independently owned) that carry a large variety of fruits and vegetables, dairy products (e.g. different brands of yogurt and cheese), fresh meat, whole grain bread, all at a reasonable cost. **Source:** Community Dietitians, Winnipeg Regional Health Authority	Nov., 2019
National Chain Food Stores	Large national chain grocery stores, >10,000 square feet (eg. Superstore, Safeway etc.) Source: Community Dietitians, Winnipeg Regional Health Authority	Nov. 2019
D. MEASURES OF FOOD INSECURITY		
Household Food Desert (2019)	The number of individuals (1 dot = 5 individuals) in low income households (Low-Income Measure, after tax - LIMAT-AT – 2016 Census), living more than 500 meters away from either a National Chain or Full Service Grocery store. Since the 2016 Census does not provide an exact location for these low-income households, they were assigned a random location within one of the 1150 dissemination areas in the Winnipeg Health Region. Distance to stores were calculated "as the crow flies" in ArcGIS. **Source**: 2016 Census (low income populations); Winnipeg Regional Health Authority (store locations); Department of Nutrition, University of Manitoba (map layer creation)	Nov. 2019
Neighborhood Food Desert (2016)	Low income (Income quintile 1 - avg. household income in 2011 Census between $14,722 and $49,506) dissemination blocks with a centroid more than 500 meters (as the crow flies) from a Full Service or National Chain grocery store. Full methodology can be found in the following publication: Food deserts in Winnipeg, Canada: a novel method for measuring a complex and contested construct (Slater et. al., 2017) **Source:** 2011 Census (income data); Winnipeg Regional Health Authority (store locations); Department of Nutrition, University of Manitoba, Food Matters Manitoba (map layer creation). **Note:** This layer was built using food store locations current as of Dec. 2015. Since that time, there have been significant changes to food store locations in Winnipeg.	June, 2016

Food Desert and Mirage Locations, Institute of Urban Studies, University of Winnipeg, 2016	Location of food desert and mirage locations identified by modeling the proximity of supermarkets to low income populations in Winnipeg. A full description of the definitions and methodology used can be found in Confronting the Illusion: Developing a Method to Identify Food Mirages and Food Deserts in Winnipeg (authors Kyle Wiebe and Dr. Jino Distasio).	
E. MEASURES OF NUTRITION INSECURITY		
Diabetes Cases (dot map of cases)	Estimated cases of diagnosed diabetes in 35-49 year olds in the year 2016. Cases (1 dot = 1 case) are distributed randomly within Winnipeg neighborhoods. **Source:** See Appendix 1 – Small Area Diabetes Costing and Projection Methodology	Dec., 2019
Diabetes Rates (Neighborhoods)	Estimated neighborhood level diagnosed diabetes prevalence rates and costs for the year 2016. **Source:** See Appendix 1 – Small Area Diabetes Costing and Projection Methodology	Dec. 2019
Diabetes Rates (City Wards)	Estimated Ward level diagnosed diabetes prevalence rates and costs for the year 2016. **Source:** See Appendix 1 – Small Area Diabetes Costing and Projection Methodology	Dec. 2019
Male Life Expectancy (Neighborhood Cluster)	Male Life Expectancy, 2012-2016 Source: 2019 MCHP RHA Indicator Atlas	Dec. 2019
F. POPULATION CHARACTERISTICS		
% Recent Immigrants	The % of the population immigrating between 2011 and 2016 by dissemination area. **Source:** 2016 Census	April, 2017
% North American Aboriginal Origins	The % of the population reporting North American Aboriginal origins by dissemination area in 2016. **Source:** 2016 Census	April 2017

II. QUERIABLE LAYERS (uses the Query or Proximity Tools)		
Food Banks (Winnipeg Harvest)	Using the query or proximity tools, generates a geographically specific report of the count of food banks served by Winnipeg Harvest and the maximum number of clients served. **Source**: Winnipeg Harvest 	Dec. 2019
Household Food Desert	Using the query or proximity tools, generates a geographically specific report of the population living in a Household Food Desert (see definition above in Map Layers section) by age group, as well as minimum, maximum, average and median distance to a food store **Source:** 2016 Census (low income populations); Winnipeg Regional Health Authority (store locations); Department of Nutrition, University of Manitoba (map layer creation)	Dec. 2019

	 Query Tool 838 Results Household Food Desert Total Household Population living in a food desert: 4190 By Age Group: Children 0-17 years of age: 1,255 Adults 18-64 yrs of age: 2,415 Seniors 65 plus: 520 Distance to a Foodstore Minimum Distance to a Food store: 500.53 metres Maximum Distance to a Food store: 1,343.8 metres Mean Distance to a Food Store: 695.2 metres Median Distance to a Food Store: median: 635.48 metres		

Appendix 1
Diabetes Small Area Estimation, Costing, and Projection Methodology

A. <u>Overview:</u> Estimated cases and costs of diagnosed diabetes, undiagnosed diabetes and prediabetes at the Neighborhood, Community Area and Ward levels in the Winnipeg Health Region were calculated for the year 2016. Cases and costs for the Winnipeg Health Region as a whole were projected to the year 2032.

It is important to note the following:

- ***Reported counts, rates and costs are not actual, but are estimates***. The methodology used to derive these are described in detail below.
- ***Since reported counts are estimates, there are no issues related to confidentiality*** or potential re-identification of individuals when small counts (< 5) are reported.
- ***Type 1 and Type 2 diabetes are not differentiated***. However, the majority (90%+) of diabetes cases are Type 2, especially in older age groups, and this percentage is rising rapidly as the prevalence of Type 2 diabetes increases in all age groups.
    - **Type 1 diabetes** (also called insulin-dependent diabetes) used to be called juvenile-onset diabetes because it most frequently begins in childhood. It is an auto-immune condition that occurs when the body attacks the pancreas with antibodies. As a result, the pancreas no longer makes insulin.
    - **Type 2 diabetes**, which used to be called non-insulin dependent or adult-onset diabetes is rapidly increasing in all age groups including children, and is due to poor nutrition and lack of physical activity.
- **Prediabetes** rates and costs are included since prediabetes affects a substantial (and an increasing) proportion of the population. Prediabetes refers to blood glucose levels that are higher than normal, but not sufficiently high to constitute a diagnosis of type 2 diabetes. People with prediabetes are already starting to suffer from the complications of diabetes. If left untreated, half of people with prediabetes will go on to develop Type 2 diabetes.

B. Methodology Overview:

- Small area counts of diagnosed diabetes were estimated at the Neighborhood, Ward and Community Area levels in the Winnipeg Health Region for the year 2016 using the indirect standardization approach (Rahman, 2017; Bajekal et. al., 2004; Charlton, 1998 Schaible, 1996;). This was accomplished by applying age, gender and income quintile specific diagnosed diabetes rates for the Winnipeg Health Region as a whole (derived from the MCHP 2019 RHA Indicators Atlas) to similarly stratified small area population counts for the year 2016. Derived case-counts were re-scaled at the Neighborhood Cluster(NC) level to ensure they matched case counts published in the 2019 RHA Indicator Atlas. Estimates of the number of undiagnosed and prediabetes cases were calculated by scaling published estimates (Chapter 3, Diabetes in America Atlas 3rd edition, 2018, Appendix 3.3) against the number of estimated diabetes cases, taking into account the difference in Canadian and U.S. definitions of prediabetes.
- Direct medical and indirect societal costs were calculated using an age-specific per-case costing formula derived from U.S. costing studies (Yang and Dall, 2018; Dall, 2019). Per-capita annual costs of diabetes were down-scaled (50%) to reflect the lower cost of health care services in the Canadian context. Indirect societal costs for the < 20 population were estimated to be one half that of the 20-39 year age group to reflect the impact on parents (work productivity and absenteeism). The indirect societal costs associated with prediabetes in all age groups were assumed to be zero as there were no published estimates to base cost estimates on. For the same reason, the direct medical and indirect societal costs of undiagnosed diabetes in the < 20 population were also assumed to be zero. Diabetes related costs were derived and classified as follows:
    i. **Medical costs** attributed to diabetes equates to the total health care expenditures for people with diabetes minus the level of expenditures that would have occurred for those people in the absence of diabetes for the following cost components:
        1. Institutional Care:
            - Hospital inpatient
            - Nursing/residential facility
            - Hospice
        2. Outpatient Care:
            - Physician services

- Emergency room use
- Ambulance services
- Hospital outpatient services
- Home Health care
- Podiatry

3. Outpatient Medications and Supplies:
   - Insulin
   - Diabetes Supplies
   - Other antidiabetes agents (exanatide, pramlintide)
   - Prescription medications
   - Other equipment and supplies

ii. **Indirect societal** costs associated with diabetes included:

1. Work days absent
2. Reduced performance at work
3. Reduced productivity days for those not in the labor force
4. Reduced labor force participation due to disability
5. Premature mortality

- Counts and costs were then projected to the year 2032 by applying age and gender specific diabetes prevalence rates and associated costs to population projections for the Winnipeg Health Region developed by Manitoba Health Seniors and Active Living. Age/gender specific prevalence rates from 2016 were incremented by 2% a year from baseline throughout the projection period to reflect the historically observed increase in annual age/gender specific diagnosed diabetes prevalence rates in Manitoba from the year 2000 to 2015 (Canadian Chronic Disease Surveillance System).

C. <u>Methodological Approach, Assumptions and Validation:</u>

- **Reasonable Estimates Approach:** This study uses a "reasonable estimates" approach based upon the indirect standardization approach to estimate expected small area counts of diagnosed diabetes. This approach has been used extensively to estimate expected counts of disease when small area data is not easily available (Rahman, 2017; Bajekal et.

al., 2004; Charlton, 1998 Schaible, 1996). The approach has been demonstrated to generate reasonably accurate small area disease count estimates as along as the global estimates used to derive those estimates are stratified by key factors affecting disease prevalence such as age, gender, and other predictors such as income or social position. For example, if we know the age, gender and income of a small area population, the approach assumes a good quality local estimate of expected disease counts can be obtained by applying age/gender/income stratified rates available only at a more global level to the local population structure. The degree to which the local estimate diverges from reality cannot be easily calculated, but a convincing argument can be made that an estimate derived in this manner is likely in the right "ballpark" (e.g. there are likely around 450 cases of diabetes in a given neighborhood, not 30, given what we know about the population size, age structure, and income level of that neighborhood).

- **Costs of Chronic Disease Are Estimated using the Results of Costing Studies:** Since exact costing data is not available locally, cost estimates for disease conditions such as diabetes must be derived by adapting cost estimates from detailed costing studies undertaken elsewhere. It is important to note that there are two approaches to estimating diabetes related direct medical costs (Public Health Agency of Canada, 2011). The first approach attempts to calculate the exact medical costs associated with treating a diabetes case (drugs, physician services etc.), while the second approach compares the differences in health care utilization (and costs) of persons with diabetes vs. persons without the disease, controlling for key variables such as age and sex. This second approach, which leads to much higher estimates of medical costs (3 to 4 times higher) is a more robust and realistic method of calculating the medical costs associated with diabetes since it captures the costs of treating all of the complications of diabetes including neurological disease, peripheral vascular disease, cardiovascular disease, kidney disease, and eye disease. The second approach is used here and draws upon costing studies that compare the overall medical costs of persons with diabetes vs. persons without the disease.

- **Undiagnosed Diabetes and Prediabetes are Estimated Directly:** The detailed inputs (age, gender, income quintile stratified rates) required to estimate the prevalence of undiagnosed diabetes and prediabetes are not available as they are for diagnosed diabetes. If one assumes that the same underlying social and biological processes responsible for diagnosed diabetes are also responsible for undiagnosed diabetes and prediabetes, then the number of undiagnosed and

prediabetes cases can be estimated from the number of identified diagnosed diabetes cases using published ratios (of undiagnosed diabetes cases/diagnosed diabetes cases, and prediabetes cases/diagnosed diabetes cases).

- **The Majority of Type 2 Diabetes and Prediabetes Cases are Preventable:** There is emerging scientific consensus that the majority (60-90%) of Type 2 diabetes and prediabetes cases are preventable through primary prevention efforts including improved nutrition and increased physical activity (International Diabetes Federation; Steinbrecher et. al.; Harvard School of Public Health; National Center for Biotechnology Information; Hu et. al. ; World Health Organization; and the U.S. Center for Disease Control.

- **Validation of Estimation Results:**

  The accuracy of the estimation results (case counts, costs) cannot be validated directly as there is no gold standard against which to do this. However, the estimation results generated through this project are consistent with results published elsewhere as follows:

  - When small area diagnosed diabetes case counts are summarized at the Winnipeg Health Region level, case counts by age and gender are almost identical those published in the MCHP 2019 RHA Indicator Atlas. When summarized at the Neighborhood Cluster or Community Area, diagnosed diabetes case counts are identical to published outputs from the 2019 RHA Indicator Atlas
  - Estimated prediabetes case counts are approximately 50% lower than those reported by Diabetes Canada in their 2018 Diabetes 360 report (national level estimates scaled to the Winnipeg Health Region population). This is likely because this project estimated prediabetes using the more conservative Canadian definition of prediabetes (Rosella et. al., 2015) while it appears that the Canadian Diabetes Costing model reported by the Diabetes 360 initiative used the more liberal American definition of prediabetes.
  - Estimated undiagnosed diabetes case counts are slightly lower than those reported by Diabetes 360 (national level estimates scaled to the Winnipeg Health Region population).
  - The annual per capita medical cost of a diagnosed diabetes case for all ages combined estimated in this study for the year 2016 was $5874 and is substantially lower than the annual per capita cost of diabetes of $7150 used by the Diabetes 360 and reported in the 2017 International Diabetes Federation Atlas (p. 74) for Canada.

- The indirect societal costs associated with diagnosed diabetes reported here are almost certainly an under-estimate since the U.S. indirect cost estimates used as inputs were down-scaled by 50%. Although the per-capita cost of delivering medical services to individuals in Canada is approximately 50% lower than in the U.S., it is unlikely that the per-capita indirect societal costs of diabetes are also 50% lower. There are no contemporary Canadian costing studies we could find to validate this.