

Integration of Population-based Cohorts into Synthetic Ecosystem Digital Convergence Platform

Project Funded by CIHR

Maahir Shah (Supervisor - Dr. Raja Sengupta)

Background

- Synthetic Populations are computationally generated populations that statistically represent a given community
- Can be linked with population cohorts and spatial environment data through probabilistic assignment – provides a “Synthetic Ecosystem”
- Future applications are in modelling, simulations, and urban and public health intervention planning
- **Project Aim:** Develop a synthetic population for Montreal CMA

Results

- Synthetic population generated for Montreal CMA
- Health services and Food organizations data integrated into Synthetic Ecosystem and visualized through a dashboard
- **Future steps:**
 - Enhance synthetic population with longitudinal cohort data (e.g., CLSA, MoNNET)
 - Simulate population interactions over time through Agent Based Modelling (ABM), to support public health decision-making

Methods

PUMF (Public Use Microdata File) for CMA

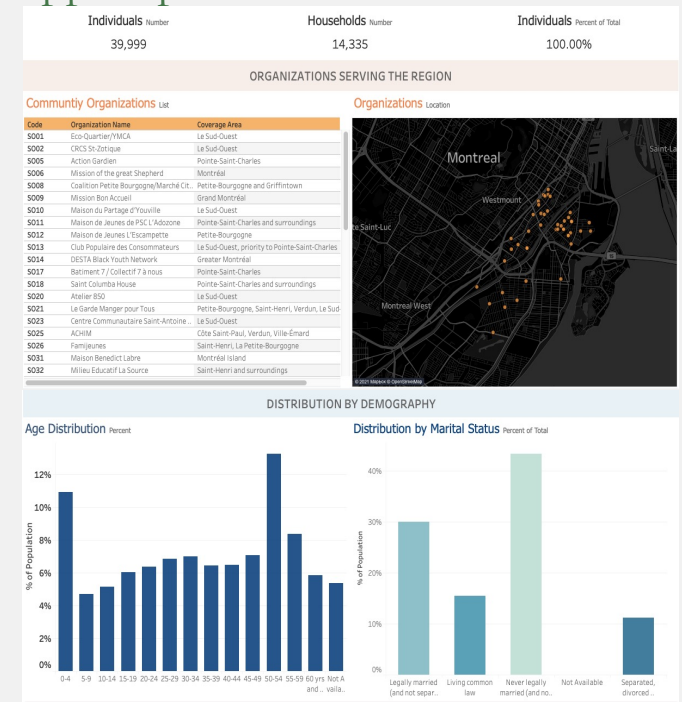
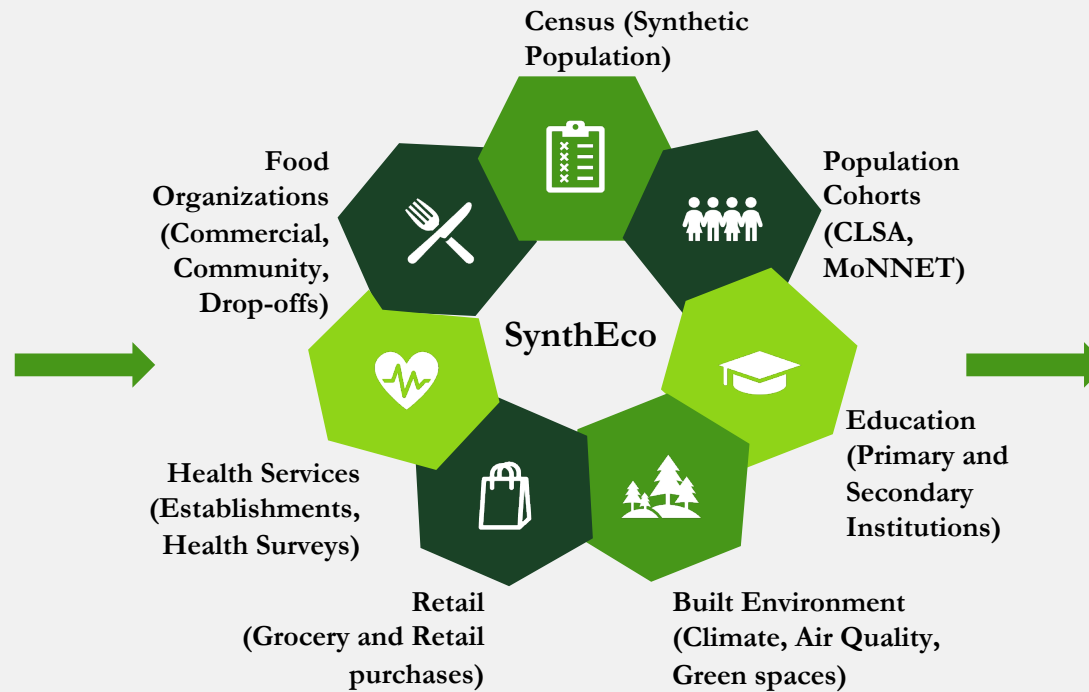
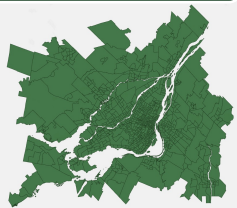
- Create Probability Distributions based on demographic variables

IPF Procedure & Sampling

- Conducted at the level of the Census Tract
- Create synthetic population based on PUMF

Geographic Allocation

- Assign locations to synthetic individuals in population



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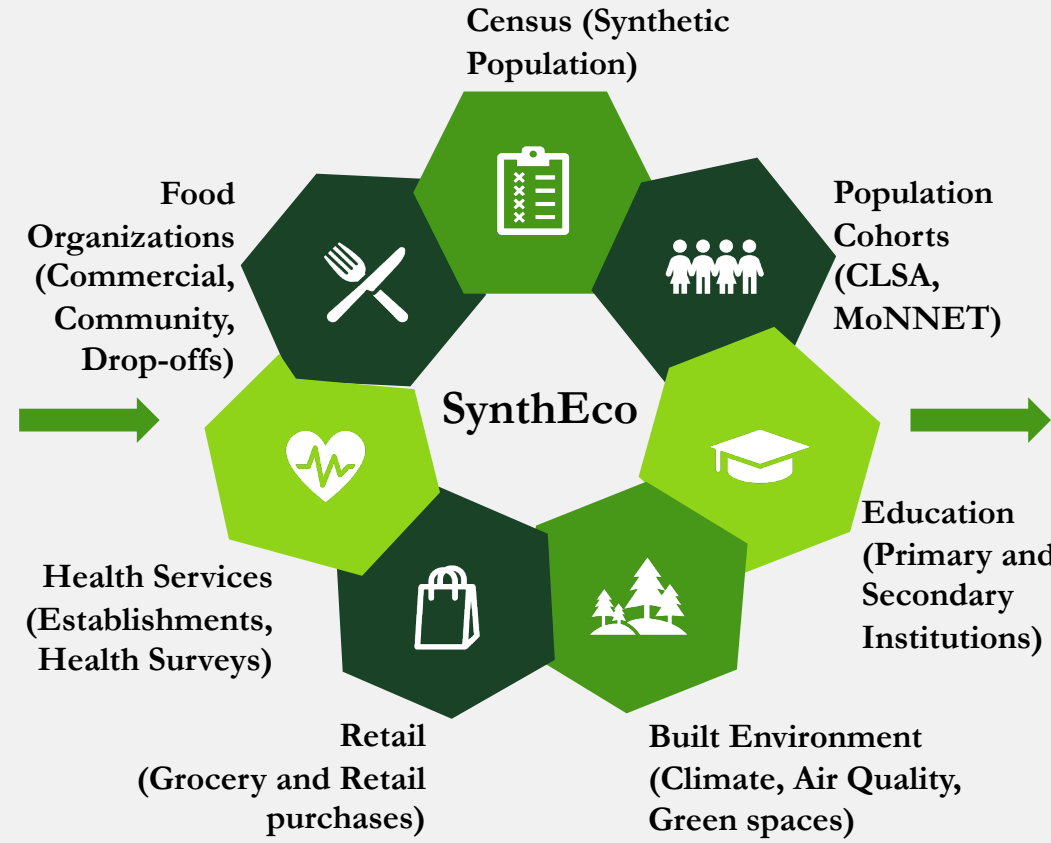
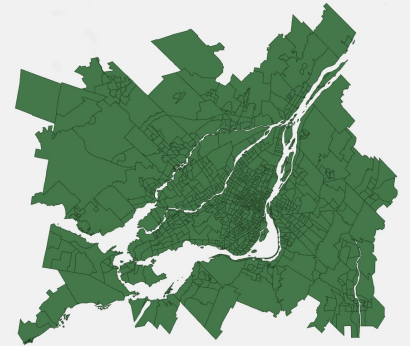
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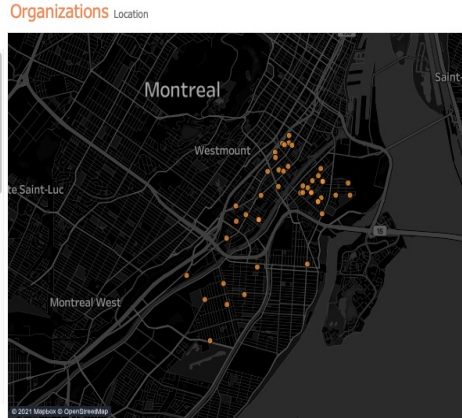


Individuals	Number	Households	Number	Individuals	Percent of Total
	39,999		14,335		100.00%

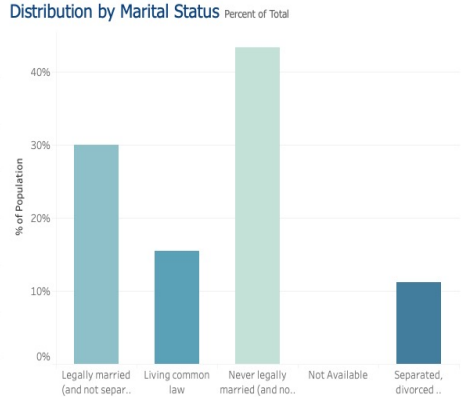
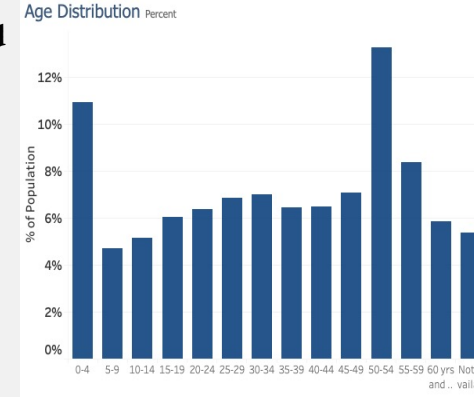
ORGANIZATIONS SERVING THE REGION

Community Organizations List

Code	Organization Name	Coverage Area
S001	Eco-Quartier/YMCA	Le Sud-Ouest
S002	CRCS St-Zotique	Le Sud-Ouest
S005	Action Gardien	Pointe-Saint-Charles
S006	Mission of the great Shepherd	Montréal
S008	Coalition Petite Bourgogne/Marché Cit.	Petite-Bourgogne and Griffintown
S009	Mission Bon Accueil	Grand Montréal
S010	Maison du Partage d'Youville	Le Sud-Ouest
S011	Maison de Jeunes de PSC L'Adozone	Pointe-Saint-Charles and surroundings
S012	Maison de Jeunes L'Escampette	Petite-Bourgogne
S013	Club Populaire des Consommateurs	Le Sud-Ouest, priority to Pointe-Saint-Charles
S014	DESTA Black Youth Network	Greater Montréal
S017	Batiment 7 / Collectif 7 à nous	Pointe-Saint-Charles
S018	Saint Columba House	Pointe-Saint-Charles and surroundings
S020	Atelier 850	Le Sud-Ouest
S021	Le Garde Manger pour Tous	Petite-Bourgogne, Saint-Henri, Verdun, Le Sud-Ouest
S023	Centre Communautaire Saint-Antoine	Le Sud-Ouest
S025	ACHIM	Côte Saint-Paul, Verdun, Ville-Émard
S026	Familleunes	Saint-Henri, La Petite-Bourgogne
S031	Maison Benedict Labre	Montréal Island
S032	Milieu Educatif La Source	Saint-Henri and surroundings



DISTRIBUTION BY DEMOGRAPHY



1. Generate Synthetic Population

2. Integrate Environmental Data

3. Develop Visualization Platform