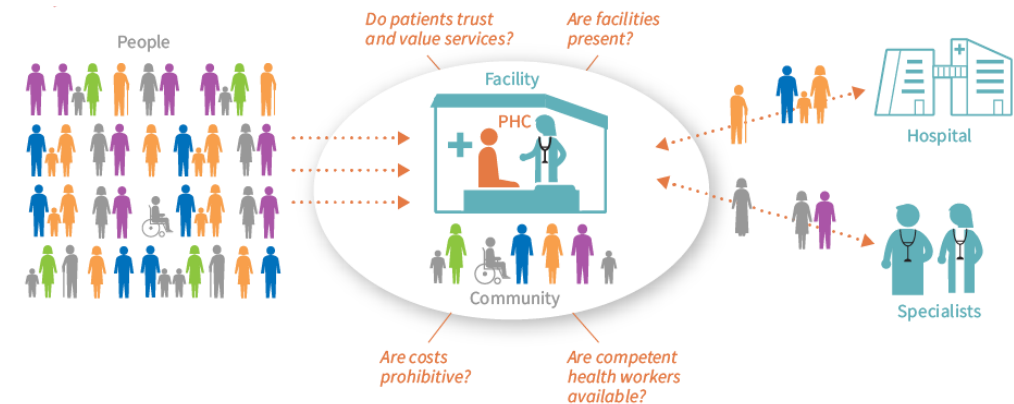# Potential availability and access to primary health care in a neighbourhood

Sook-Yee Chong

Introduction

- Access to health care services is important in maintaining health, preventing and managing disease, and reducing premature death. This means that availability and timely access to primary health services is needed.

Accessibility to primary health service
(improvingphc.org/first-contact-accessibility)

Aim

- The aim of this study is to determine if residents in a borough would have quick access to primary health services in their respective neighbourhood.
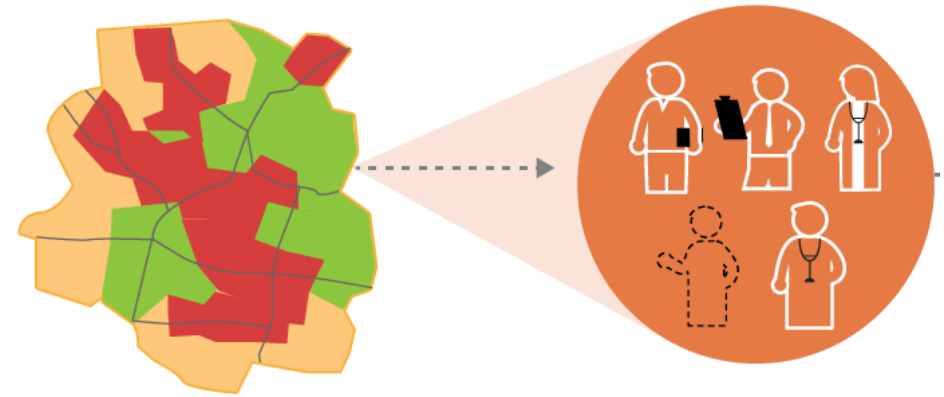
Accessibility to primary health service within a neighbourhood
(improvingphc.org/first-contact-accessibility)

Methods

- Foursquare API is utilised to pull the location data in New York.

- A list of venues are requested, returning a hierarchical list of categories. Response fields like Venue Name, Venue Location and Venue Category were requested from Foursquare.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.91066	NewYork-Presbyterian/The Allen Hospital	40.873327	-73.913051	Hospital
1	Marble Hill	40.876551	-73.91066	USA Vascular Centers	40.875152	-73.909602	Medical Center
2	Marble Hill	40.876551	-73.91066	Riverdale Audiology	40.879582	-73.908073	Medical Center
3	Marble Hill	40.876551	-73.91066	USA Vein Clinics	40.875314	-73.909535	Doctor's Office
4	Marble Hill	40.876551	-73.91066	USA Fibroid Centers	40.875760	-73.908281	Doctor's Office
5	Marble Hill	40.876551	-73.91066	St. Joseph's Imaging Center	40.879963	-73.907951	Medical Center
6	Marble Hill	40.876551	-73.91066	Advanced Endoscopy Center	40.876770	-73.906488	Doctor's Office
7	Marble Hill	40.876551	-73.91066	Riverdale Family Practice	40.879941	-73.907996	Doctor's Office
8	Marble Hill	40.876551	-73.91066	Columbia Doctors	40.879582	-73.908073	Doctor's Office
9	Marble Hill	40.876551	-73.91066	Montefiore Medical Group-Marble Hill	40.877639	-73.906119	Doctor's Office
10	Marble Hill	40.876551	-73.91066	Sahadeo D. Ramnauth, MD	40.873348	-73.913017	Doctor's Office
11	Marble Hill	40.876551	-73.91066	Riverdale Eye Associates	40.878632	-73.914774	Doctor's Office
12	Marble Hill	40.876551	-73.91066	Wolfeld Plastic Surgery, LLC	40.878657	-73.914814	Doctor's Office
13	Marble Hill	40.876551	-73.91066	Riverdale Pediatrics	40.879202	-73.914397	Doctor's Office
14	Marble Hill	40.876551	-73.91066	Southern Westchester Orthopedics	40.879902	-73.907761	Doctor's Office
15	Marble Hill	40.876551	-73.91066	Ola Pediatrician	40.878707	-73.905973	Doctor's Office
16	Marble Hill	40.876551	-73.91066	Godwin Medical	40.878845	-73.905976	Doctor's Office
17	Marble Hill	40.876551	-73.91066	Dr Joanna D'elia ENT	40.880085	-73.913943	Doctor's Office
18	Marble Hill	40.876551	-73.91066	The Allen Pavillion/ Room 63-1	40.873348	-73.913017	Hospital
19	Marble Hill	40.876551	-73.91066	Allen Hospital Breastfeeding Fair	40.873348	-73.913017	Hospital

Methods

- Data was filtered to 'Doctor's office' and 'Medical center'

- Example of data filtered to 'Doctor's office'

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
3	Marble Hill	40.876551	-73.910660	USA Vein Clinics	40.875314	-73.909535	Doctor's Office
4	Marble Hill	40.876551	-73.910660	USA Fibroid Centers	40.875760	-73.908281	Doctor's Office
6	Marble Hill	40.876551	-73.910660	Advanced Endoscopy Center	40.876770	-73.906488	Doctor's Office
7	Marble Hill	40.876551	-73.910660	Riverdale Family Practice	40.879941	-73.907996	Doctor's Office
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16	Marble Hill	40.876551	-73.910660	Godwin Medical	40.878845	-73.905976	Doctor's Office
17	Marble Hill	40.876551	-73.910660	Dr Joanna D'elia ENT	40.880085	-73.913943	Doctor's Office
45	Chinatown	40.715618	-73.994279	Dr. Chun T. Wong M.D. (Gastroenterologist)	40.713978	-73.993401	Doctor's Office
46	Chinatown	40.715618	-73.994279	Dr Dang Dung Nguyen	40.716730	-73.995316	Doctor's Office
47	Chinatown	40.715618	-73.994279	Dr. Song Office	40.714561	-73.992348	Doctor's Office
48	Chinatown	40.715618	-73.994279	Liu & Zhou Medical Office	40.714073	-73.993414	Doctor's Office
50	Chinatown	40.715618	-73.994279	Timothy Wong, MD	40.717186	-73.995842	Doctor's Office
51	Chinatown	40.715618	-73.994279	Dr. Yixiu Zheng	40.714377	-73.996356	Doctor's Office

Methods

- Population data are accessed from data.cityofnewyork.us.

- Population data filtered for 2010 (most recent year found)

- Some neighbourhoods with common names were combined

	borough	Neighborhood	population
17	Manhattan	Battery Park City-Lower Manhattan	39699
1	Manhattan	Central Harlem North-Polo Grounds	75282
5	Manhattan	Central Harlem South	43383
18	Manhattan	Chinatown	47844
9	Manhattan	Clinton	45884
23	Manhattan	East Harlem North	58019
22	Manhattan	East Harlem South	57902
14	Manhattan	East Village	44136
13	Manhattan	Gramercy	27988
2	Manhattan	Hamilton Heights	48520
7	Manhattan	Hudson Yards-Chelsea-Flat Iron-Union Square	70150
20	Manhattan	Lenox Hill-Roosevelt Island	80771
8	Manhattan	Lincoln Square	61489
19	Manhattan	Lower East Side	72957
3	Manhattan	Manhattanville	22950
0	Manhattan	Marble Hill-Inwood	46746
10	Manhattan	Midtown-Midtown South	28630
4	Manhattan	Morningside Heights	55929
12	Manhattan	Murray Hill-Kips Bay	50742
16	Manhattan	SoHo-TriBeCa-Civic Center-Little Italy	42742

Methods

Neighbourhoods did not match in both datasets, so weighted mean was used instead

	Neighborhood	Doctor's Office	Medical Center
0	Battery Park City	8	5
1	Carnegie Hill	85	13
2	Central Harlem	8	2
3	Chelsea	55	19
4	Chinatown	58	13
5	Civic Center	65	20
6	Clinton	8	8
7	East Harlem	6	4
8	East Village	29	9
9	Financial District	61	30
10	Flatiron	63	30
11	Gramercy	62	29
12	Greenwich Village	49	20
13	Hamilton Heights	6	2
14	Hudson Yards	4	6
15	Inwood	14	5
16	Lenox Hill	82	16
17	Lincoln Square	72	14
18	Little Italy	73	14
19	Lower East Side	6	2

Neighborhood	population
Battery Park City-Lower Manhattan	39699
Central Harlem	118665
Chinatown	47844
Clinton	45884
East Harlem	115921
East Village	44136
Gramercy	27988
Hamilton Heights	48520
Hudson Yards-Chelsea-Flat Iron-Union Square	70150
Lenox Hill-Roosevelt Island	80771
Lincoln Square	61489
Lower East Side	72957
Manhattanville	22950
Marble Hill-Inwood	46746
Midtown-Midtown South	28630
Morningside Heights	55929
Murray Hill-Kips Bay	50742
SoHo-TriBeCa-Civic Center-Little Italy	42742
Stuyvesant Town-Cooper Village	21049
Turtle Bay-East Midtown	51231

Health services from Foursquare

Population data from data.cityofnewyork.us

Methods

- K-means clustering algorithm was used to find clusters within the dataset.

- This is to differentiate neighbourhoods based on locations and number of medical centres and doctor's clinics.
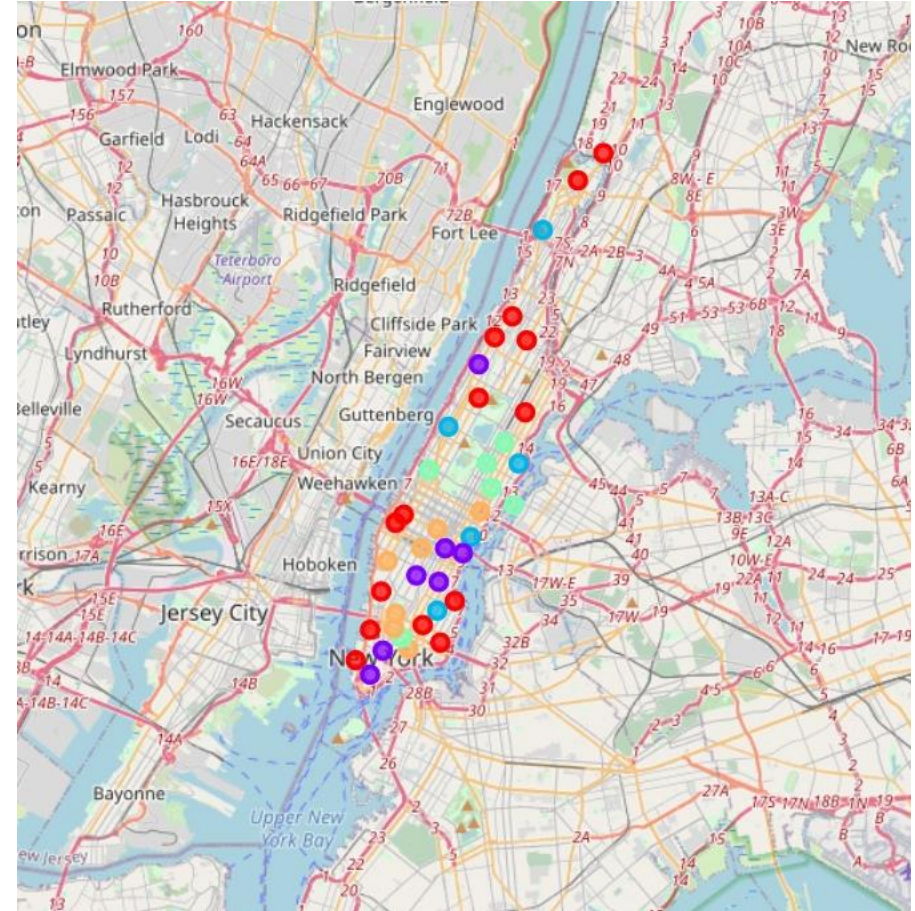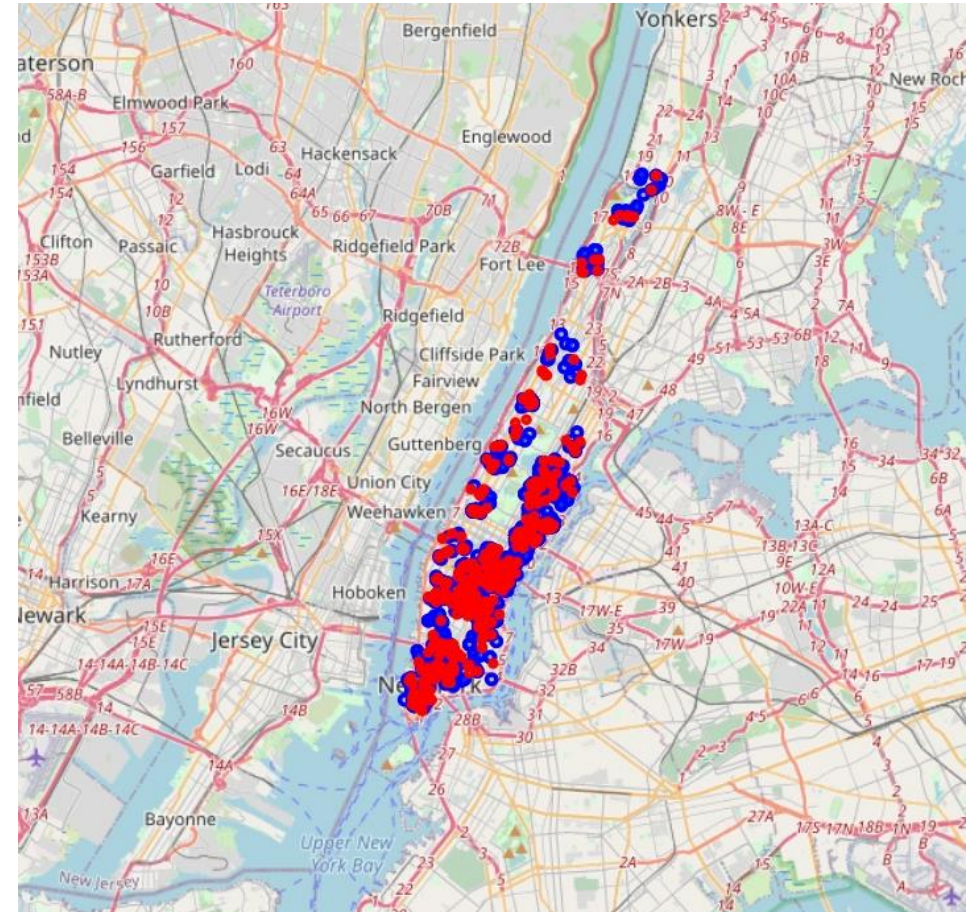
Results

- Number of doctor's office and medical center in each neighbourhood
- Ranked according to doctor's office

	Neighborhood	Doctor's Office	Medical Center
28	Roosevelt Island	87	12
1	Carnegie Hill	85	13
16	Lenox Hill	82	16
35	Upper East Side	77	21
18	Little Italy	73	14
17	Lincoln Square	72	14
5	Civic Center	65	20
10	Flatiron	63	30
11	Gramercy	62	29
9	Financial District	61	30
26	Murray Hill	60	24
25	Morningside Heights	60	21
33	Tudor City	60	30
23	Midtown	59	12
4	Chinatown	58	13
31	Sutton Place	56	17
3	Chelsea	55	19
24	Midtown South	52	25
12	Greenwich Village	49	20
29	Soho	44	16

Results

- Map of medical centers (in red) and doctor's clinics (in blue)

Results

- Top 10 Neighbourhoods with doctor's office and medical centers per 1000 residents.

|	Neighborhood	Doctor's Office	Medical Center
28	Roosevelt Island	1.590922	0.219437
1	Carnegie Hill	1.554349	0.237724
16	Lenox Hill	1.499490	0.292583
35	Upper East Side	1.408057	0.384016
18	Little Italy	1.334911	0.256010
17	Lincoln Square	1.316625	0.256010
5	Civic Center	1.188620	0.365729
10	Flatiron	1.152047	0.548594
11	Gramercy	1.133760	0.530307
9	Financial District	1.115474	0.548594

Results

- Bottom 10 Neighbourhoods with least number of doctor's office and medical centers per 1000 residents.

|	Neighborhood	Doctor's Office	Medical Center
0	Battery Park City	0.146292	0.091432
6	Clinton	0.146292	0.146292
2	Central Harlem	0.146292	0.036573
19	Lower East Side	0.109719	0.036573
13	Hamilton Heights	0.109719	0.036573
7	East Harlem	0.109719	0.073146
20	Manhattan Valley	0.109719	0.091432
32	Tribeca	0.091432	0.073146
14	Hudson Yards	0.073146	0.109719
21	Manhattanville	0.036573	0.091432

Discussion

- Cluster 3 (in light green) has the highest number of doctor's centres and medical centres

- This is not surprising as that is close to the centre of Manhattan.

- Those in red has the least number of doctor's centres and medical centres.
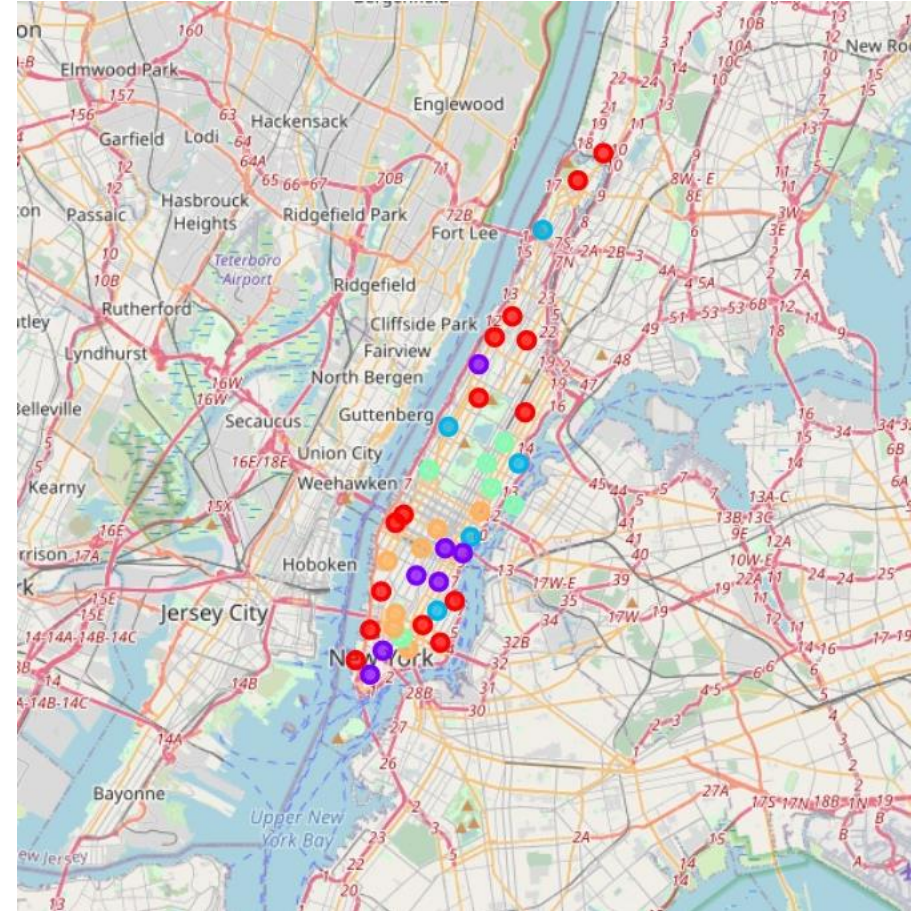
Discussion

- The closer you are to centre of Manhattan, there are higher chances of accessing primary health services.
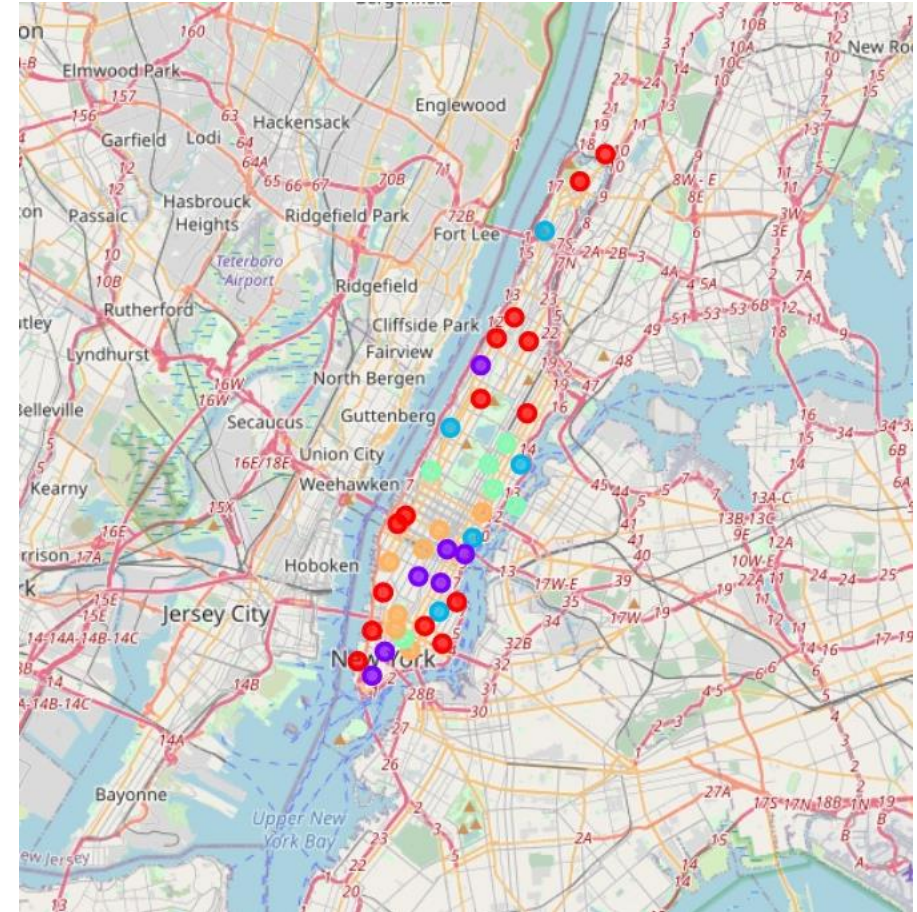
Conclusion

- Neighbourhoods closest to the centre have the highest number/density of doctor's clinics and medical centres.

- Neighbourhoods with the least number of doctor's clinics and medical centres were also identified. So residents in those neighbourhoods may not have quick access to a primary health service to get a primary diagnosis.
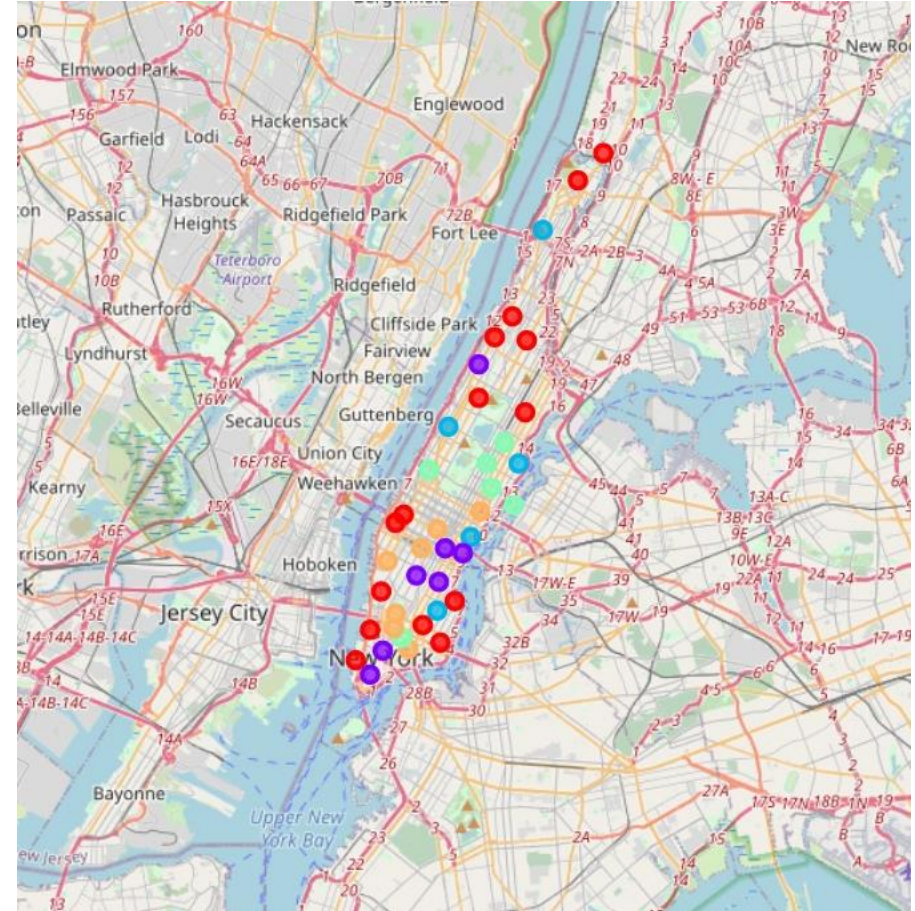
Recommendations

- The state should address physician/clinic shortages in neighbourhoods further away from the centre (such as Battery Park City).

- Digital health interventions (with the use of apps) could be part of a strategic process to allow residents assess to a quick health assessment, or direct them to the nearest care facility (if necessary).