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YTÜ YILDIZ TEKNİK ÜNİVERSİTESİ

Rethinking Urban Living Environments: Investigating the Influence of Built Environment Features on Physical Activity Levels- Evidence from a Cross-Sectional Study in Ankara, Türkiye

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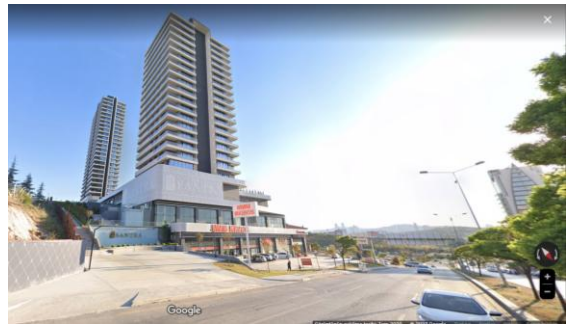
RELEVANCE TO THE THEME:
Relentless growth into Space

What happens to the physical attributes of built environments? -we can only get a hold of….

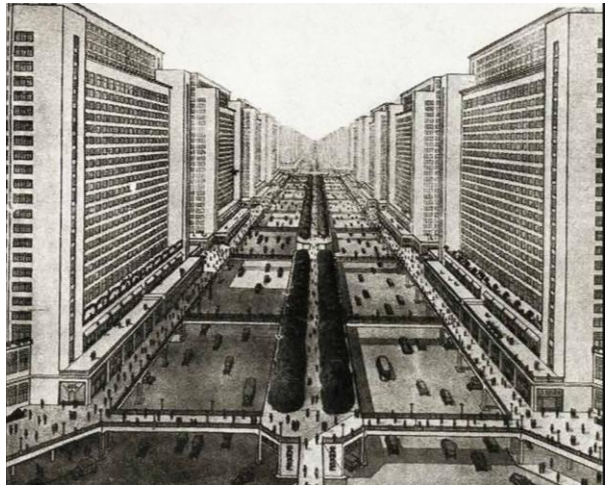
- **street network**
- **land use characteristics,**
- **population density**
- **socio-economic features**

As planners, what is our role in this transformative environment?



URBAN LIVING ENVIRONMENTS: TRANSFORMATION & GROWTH



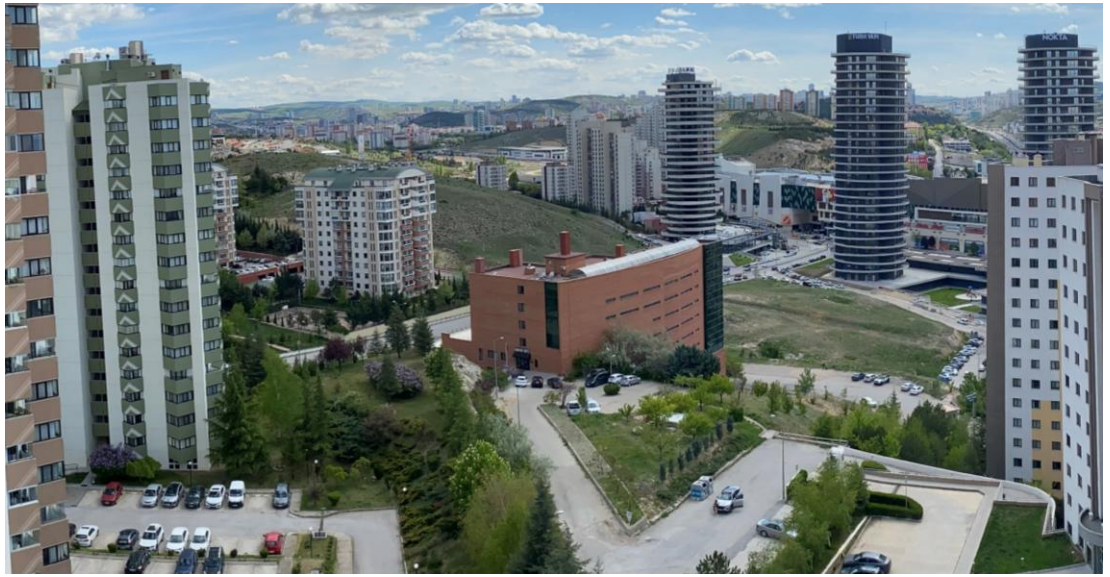
Top: Illustration of Urban Transformation
Bottom: Le Corbusier, 1920-1950

Top: Nilüfer Neighborhood, Bursa, 2020
Bottom: Ümit Neighborhood, Ankara, 2022

CHANGE FOR THE BETTER?

ÇAYYOLU, 2002

ÇAYYOLU, 2012



ÇAYYOLU, 2022

URBAN LIVING ENVIRONMENTS

Pruitt–Igoe (Destruction Date: 1972)

The Relationship of Built Environments with Health Indicators and Quality of Life: A Community Participatory Model Proposal for Healthy Cities

ACKNOWLEDGMENTS

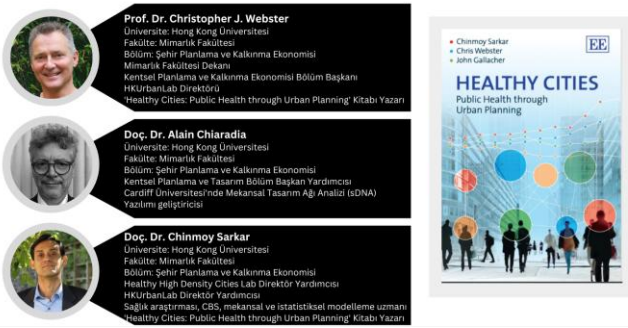
The Scientific and Technological Research Council of Türkiye

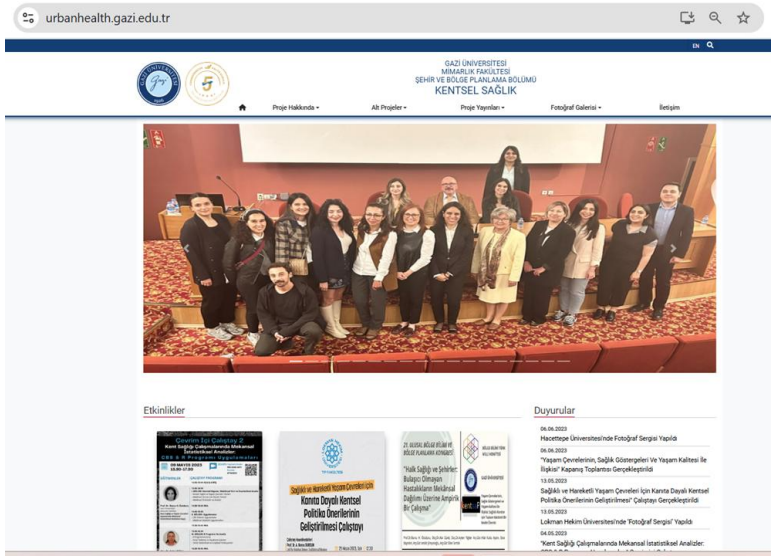
TUBİTAK - 1003 Project: Prioritizing Quality of Life and Urban Living Environments

Grant No. 218K368 & 218K371

Project Duration: 01/12/2019 – 01/06/2023

https://urbanhealth.gazi.edu.tr/

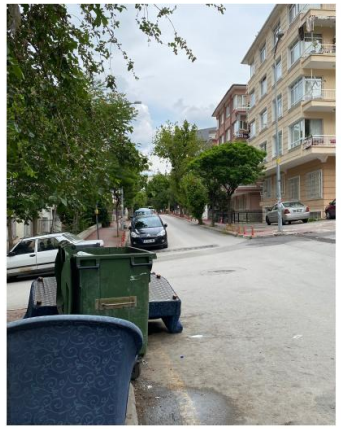




PROBLEM DEFINITION

- What are the constituents of:
  - high-quality, active, healthy, livable built environments
- Can we explain the relationship between
  - Overall health status of individuals
  - Physical attributes of a built environment

Katılımcılar yaşam alanlarında fiziksel aktivite sırasında güvenlik ile ilgili sorunları da dile getirmişlerdir. Bazı yerlerde yol bittiği halde uyarı işaretinin olmaması, inşaat alanları ve atıkları, boş ve tenha alanların güvensiz olması ve serbest gezen köpek grupları en fazla bahsedilen konular olmuştur.



50. Yıl Parkı

Seğmenler Parkı

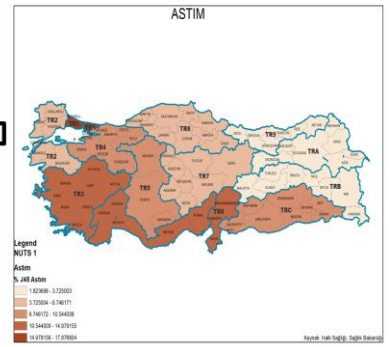
Mavi Göl

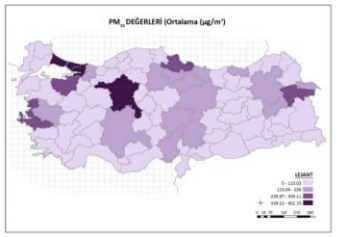
Mavi Göl

PROJECT SCOPE

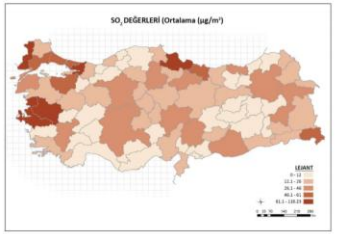
Regional, City, Neighborhood (Ankara) & Individual Level Analyses (Ankara)

Code	Definition
TRA	KUZEYDOĞU ANADOLU
TRB	ORTADOĞU ANADOLU
TR1	İSTANBUL
TR2	BATI MARMARA
TR3	EGE
TR4	DOĞU MARMARA
TR5	BATI ANADOLU
TR6	AKDENİZ
TR7	ORTA ANADOLU
TR8	BATI KARADENİZ
TR9	DOĞUKARADENİZ

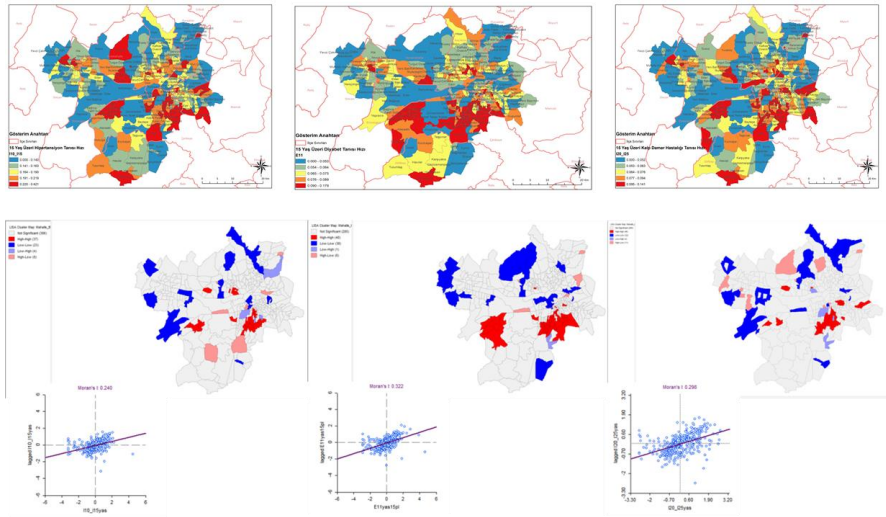


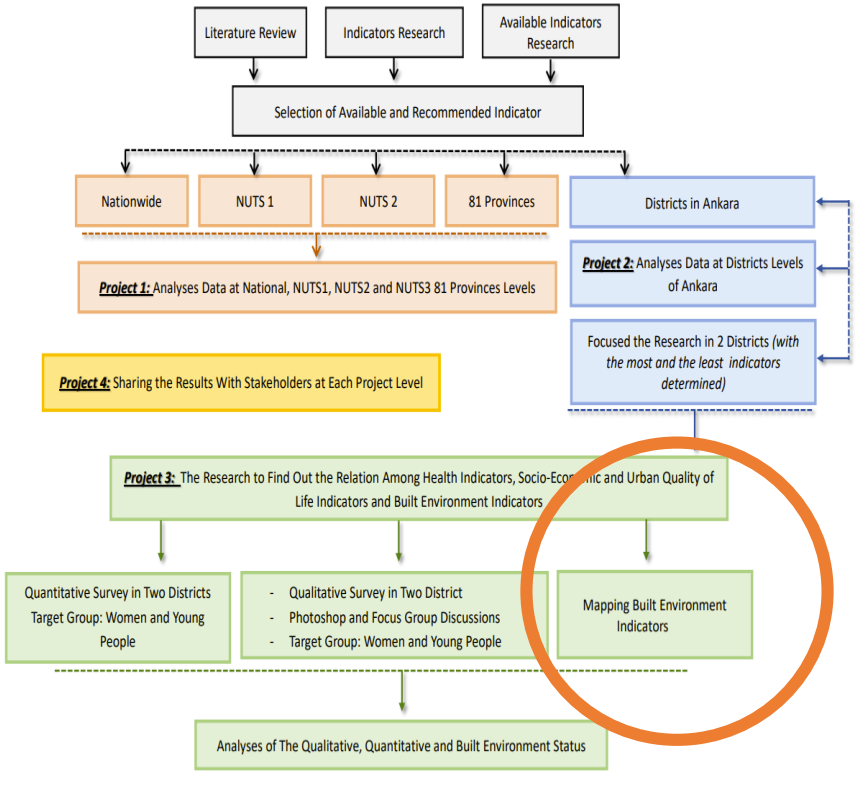


Harita 2 Türkiye illere göre PM_{10} değerleri

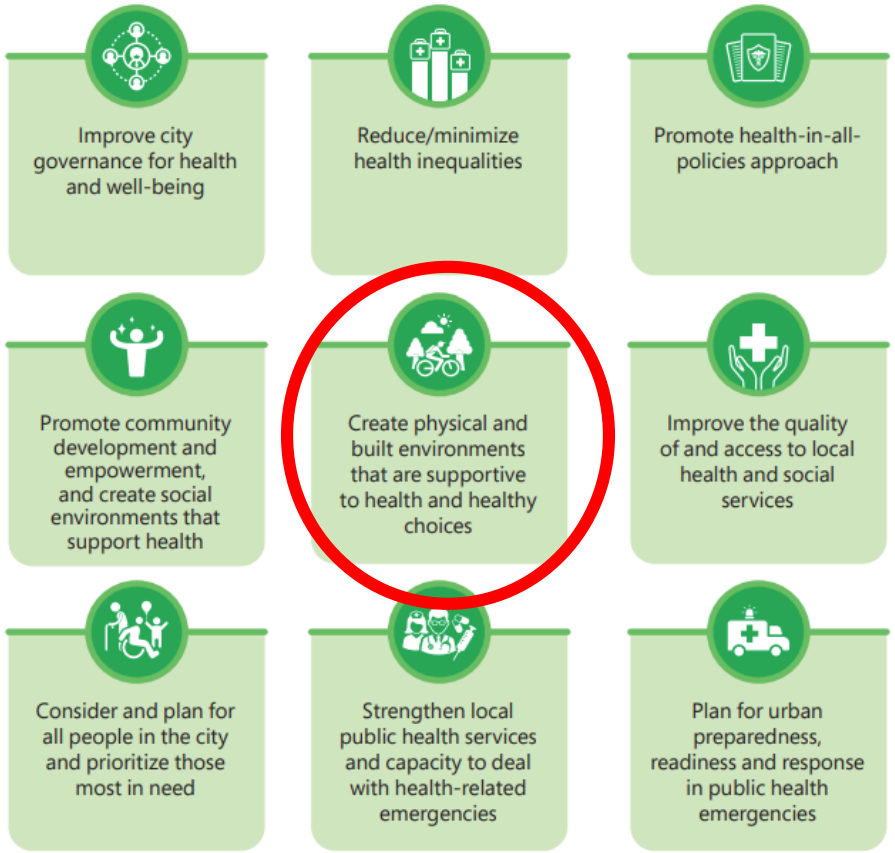


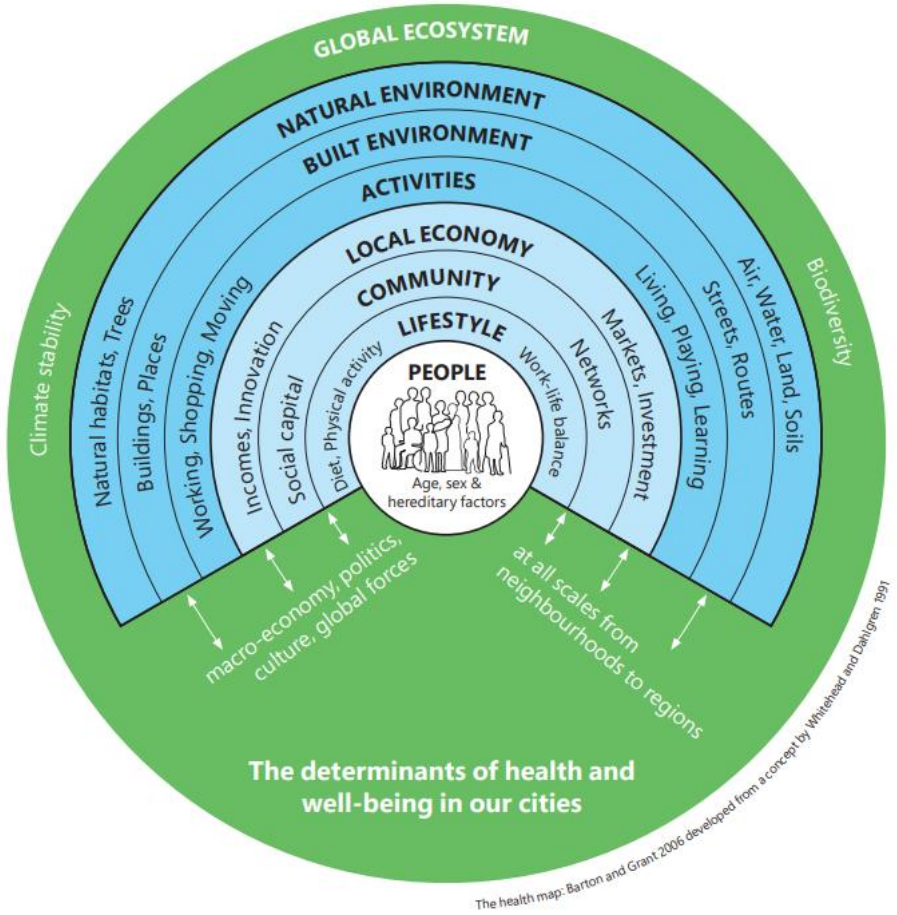
Harita 3 Türkiye illere göre SO_2 değerleri





CONTEXT:
URBAN HEALTH & HEALTHY CITIES





Reference: Healthy cities effective approach to a rapidly changing world. Geneva: World Health Organization; 2020. License: CC BY-NC-SA 3.0 IGO.

BUILT ENVIRONMENT EPIDEMIOLOGY

Risk Factors for Non-Communicable Diseases (NCDs)

- Physical inactivity
- Air, water, noise, and environmental pollution
- Limited access to health infrastructure and other urban services

How to eliminate the risks?

- Increase physical activity
- Decrease pollution
- Increase overall accessibility to urban services

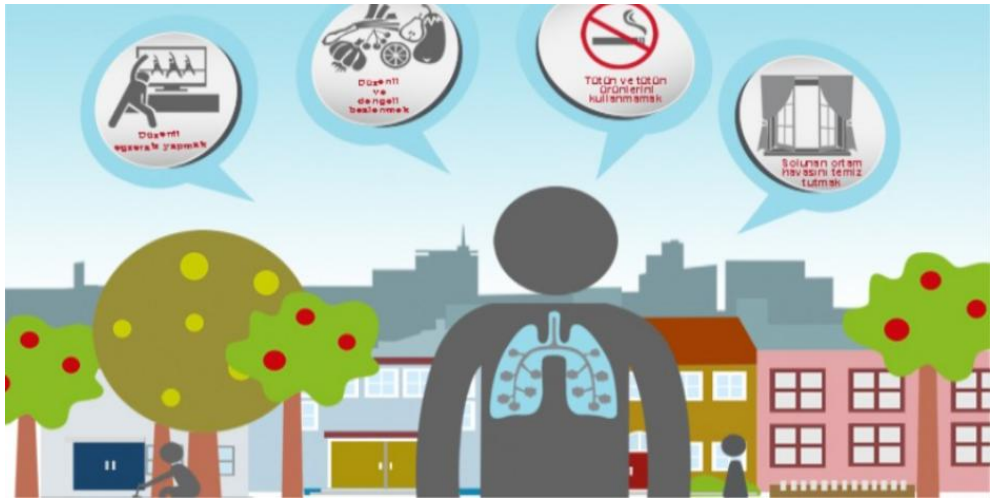
At neighborhood scale: housing density, economic structure, centrality, accessibility, distance/walkability to green areas, land use diversity, and its level of integration can be linked to NCDs & their risk factors, such as physical inactivity.

What about the residents' perspective?

So ….our quest is to investigate how our **overall health perception** is affected by the urban living environments?

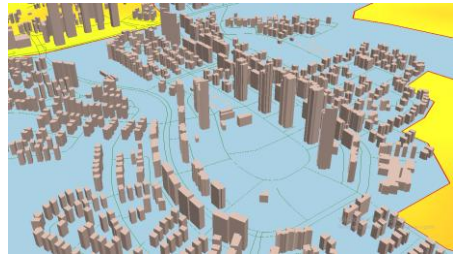
QUALITY OF LIFE AND URBAN LIVING ENVIRONMENTS

- Personal Features
  - Genetics & Biology
  - Beliefs, food habits, lifestyle preferences, and family structure
- Environmental Features
  - Heat – light features
  - Air, water, and environmental pollution
  - Climate conditions



- Public Health & City Planning and Design (3D+2D) (Ewing & Cervero, 2010)
  - Design
  - Density
  - Diversity
  - Accessibility
    - Distance to Transit
    - Distance to Urban Services & Green Spaces

RESEARCH METHODOLOGY: NEIGHBORHOOD SELECTION

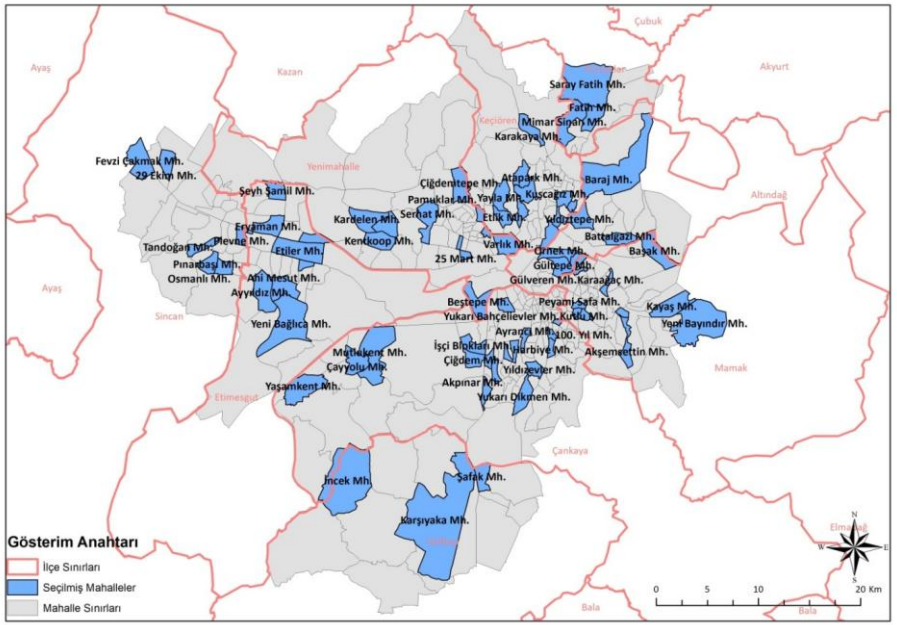


Study Area: Ankara, Türkiye

Survey Duration: 21st December 2021 and 15th March 2022

Sample Size: 4015 valid interviews

76 neighborhoods (distributed by SES and clusters)

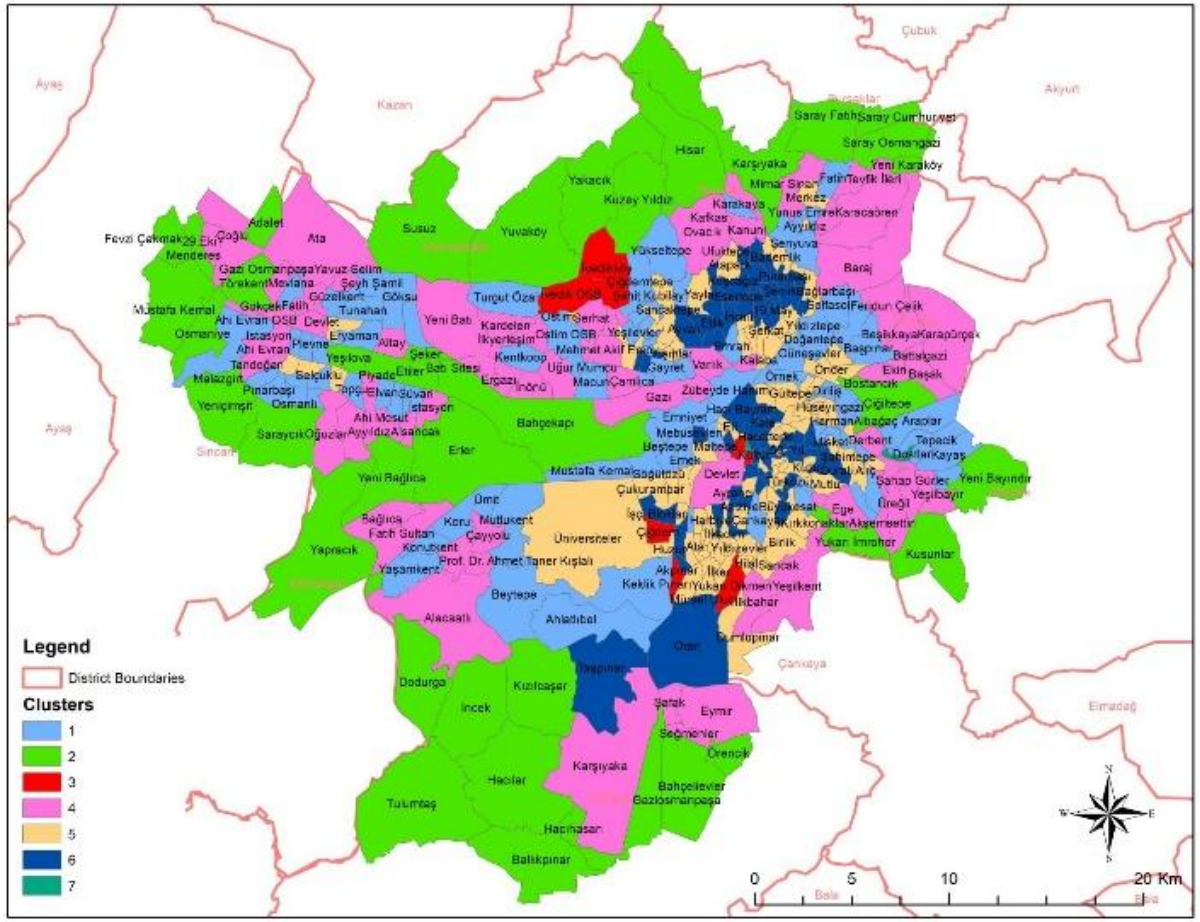


Cluster	Population 2020	Share of Population	Sample Size		Actual Distribution of Interviews	
			Number	%	Number	%
1	1,393,621	0,28	929	23.23	953	23.74
2	326,598	0,07	450	11.25	420	10.46
3+7*	39,286	0,01	176	4.40	177	4.41
4	1,112,234	0,22	830	20.75	828	20.62
5	1,217,823	0,24	869	21.73	878	21.87
6	898,796	0,18	746	18.65	759	18.90
Toplam	4,988,358	1,00	4,000	100.00	4,015	100.00

* The clusters are merged due to the size and similarity of cluster 3 and 7.

RESEARCH METHODOLOGY: NEIGHBORHOOD SELECTION

Key Variables
Housing Density
Floor Area Ratio (FAR*)
TPBtA1000
TPBtA5000
Number of pharmacies per 1000 people
Number of eating and drinking places per 1000 people
Land Price
Number of chain markets per 1000 people
Number of physicians per 1000 people
Number of primary healthcare centers per 1000 people
MAD1000
MAD5000
Volume
Average Height
Active Green Areas per Person
Active Green Area Ratio



RESPONDENT ATTRIBUTES

DEMOGRAPHIC & SOCIO-ECONOMIC ATTRIBUTES

VARIABLES	Frequency	%	Cumulative %
Education			
Primary and Secondary School	1593	39.7	39.7
High School	1455	36.2	75.9
University	864	21.5	97.4
No Education	103	2.6	100
SES			
Moderate Low	1193	29.7	29.7
Moderate	1068	26.6	56.3
Moderate High	773	19.3	75.6
High	407	10.1	85.7
Low	574	14.3	100
Age Grouped into 4 Classes			
<29	799	19.9	19.9
30-44	1253	31.2	51.1
45-64	1399	34.8	86
>65	564	14	100

LIFESTYLE & BEHAVIORAL ATTRIBUTES

VARIABLES	Frequency	%	Cumulative %
GreenSpaceRef			
Visits Green Spaces	2001	49.8	49.8
Not Available	156	3.9	53.7
Does Not Visit Green Spaces	1858	46.3	100
Environment Attitude			
Negative	1030	25.7	25.7
Moderate	1418	35.3	61
Positive	1567	39	100
Physical Acitivity Level (metref)			
Moderate	1943	48.4	48.4
High	622	15.5	63.9
Low	1450	36.1	100
Life Satisfaction			
Very High/High	1856	46.2	46.2
Not Satisfied	1541	38.4	84.6
Undecided	618	15.4	100
BMI			
<18,5 (Underweight); 18,5-24,99 (Normal Weight)	1786	44.5	44.5
25,00-29,99 (Overweight)	1648	41	85.7
30,00 ve üstü (Obesity-Morbid Obesity)	575	14.3	100

MULTINOMIAL LOGISTIC MODEL RESULTS: MODERATE

SIGNIFICANT VARIABLES

SocioEconomicStatus (SES)

Age Grouped into 4 Classes

GreenSpace (2: Not Available)

Environment Attitude (1: Negative)

Physical Activity Level

(1: Moderate; 2 High)

BMI (1: Underweight & Normal;

2: Overweight)

LifeSatisfaction

(1: High/Very High; 2: Low/Very Low)

Parameter Estimates

Overall Health Assessment		B	Std. Error	Wald	df	Sig.	Exp(B)	Interval for Exp(B)	
								Lower Bound	Upper Bound
Moderate	Intercept	3.169	0.510	38.585	1	0.000			
	Education	-0.073	0.089	0.670	1	0.413	0.930	0.780	1.107
	SES	**-0.175**	**0.055**	**10.059**	**1**	**0.002**	**0.840**	**0.754**	**0.935**
	Age Grouped into 4 Classes	**-0.244**	**0.094**	**6.663**	**1**	**0.010**	**0.784**	**0.651**	**0.943**
	[Greenspaceref=1.00]	-0.113	0.171	0.433	1	0.510	0.893	0.639	1.250
	[Greenspaceref=2.00]	**-1.341**	**0.321**	**17.392**	**1**	**0.000**	**0.262**	**0.139**	**0.491**
	[Greenspaceref=3.00]	0[b]			0				
	[EnvironmentAttitude=1.00]	**-0.799**	**0.194**	**16.907**	**1**	**0.000**	**0.450**	**0.307**	**0.658**
	[EnvironmentAttitude=2.00]	0.141	0.218	0.420	1	0.517	1.152	0.751	1.767
	[EnvironmentAttitude=3.00]	0[b]			0				
	[PhysicalActivityLevel=1.00]	**0.995**	**0.175**	**32.324**	**1**	**0.000**	**2.705**	**1.920**	**3.813**
	[PhysicalActivityLevel=2.00]	**0.593**	**0.274**	**4.694**	**1**	**0.030**	**1.809**	**1.058**	**3.092**
	[PhysicalActivityLevel=3.00]	0[b]			0				
	[BMI=1]	**1.072**	**0.220**	**23.701**	**1**	**0.000**	**2.922**	**1.897**	**4.499**
	[BMI=2]	**0.777**	**0.203**	**14.715**	**1**	**0.000**	**2.175**	**1.462**	**3.236**
	[BMI=3]	0[b]			0				
	[LifeSatisfaction=1.00]	**-0.796**	**0.307**	**6.733**	**1**	**0.009**	**0.451**	**0.247**	**0.823**
	[LifeSatisfaction=2.00]	**-0.893**	**0.290**	**9.489**	**1**	**0.002**	**0.409**	**0.232**	**0.723**
	[LifeSatisfaction=3.00]	0[b]			0				

a. The reference category is: bad/very bad.

b. This parameter is set to zero because it is redundant.

MULTINOMIAL LOGISTIC MODEL RESULTS: GOOD/VERY GOOD

SIGNIFICANT VARIABLES

SocioEconomicStatus (SES)

Age Grouped into 4 Classes

GreenSpace (2: Not Available)

Environment Attitude

(1: Negative; 2: Moderate)

Physical Activity Level

(1: Moderate; 2 High)

BMI (1: Underweight & Normal; 2: Overweight)

LifeSatisfaction

(1: High/Very High; 2: Low/Very Low)

Parameter Estimates

Overall Health Assessment		B	Std. Error	Wald	df	Sig.	Exp(B)	Interval for Exp(B) Lower Bound	Interval for Exp(B) Upper Bound
Good/Very Good	Intercept	4.337	0.507	73.090	1	0.000			
	Education	0.167	0.089	3.540	1	0.060	1.181	0.993	1.405
	SES	-0.067	0.055	1.485	1	0.223	0.935	0.839	1.042
	Age Grouped into 4 Classes	**-0.690**	**0.094**	**53.603**	**1**	**0.000**	**0.502**	**0.417**	**0.603**
	[Greenspaceref=1.00]	0.066	0.172	0.149	1	0.699	1.068	0.763	1.495
	[Greenspaceref=2.00]	**-0.750**	**0.301**	**6.198**	**1**	**0.013**	**0.472**	**0.262**	**0.853**
	[Greenspaceref=3.00]	0[b]			0				
	[EnvironmentAttitude=1.00]	**-1.662**	**0.194**	**73.496**	**1**	**0.000**	**0.190**	**0.130**	**0.277**
	[EnvironmentAttitude=2.00]	**-0.469**	**0.217**	**4.668**	**1**	**0.031**	**0.626**	**0.409**	**0.957**
	[EnvironmentAttitude=3.00]	0[b]			0				
	[PhysicalActivityLevel=1.00]	**0.841**	**0.176**	**22.940**	**1**	**0.000**	**2.320**	**1.644**	**3.273**
	[PhysicalActivityLevel=2.00]	**1.041**	**0.267**	**15.166**	**1**	**0.000**	**2.832**	**1.677**	**4.782**
	[PhysicalActivityLevel=3.00]	0[b]			0				
	[BMI=1]	**0.910**	**0.218**	**17.437**	**1**	**0.000**	**2.484**	**1.621**	**3.808**
	[BMI=2]	**0.458**	**0.200**	**5.218**	**1**	**0.022**	**1.580**	**1.067**	**2.340**
	[BMI=3]	0[b]			0				
	[LifeSatisfaction=1.00]	0.166	0.304	0.297	1	0.586	1.180	0.650	2.144
	[LifeSatisfaction=2.00]	**-1.321**	**0.291**	**20.602**	**1**	**0.000**	**0.267**	**0.151**	**0.472**
	[LifeSatisfaction=3.00]	0[b]			0				

a. The reference category is: bad/very bad.

b. This parameter is set to zero because it is redundant.

OTHER FINDINGS

SIGNIFICANT FINDINGS

- a significant relationship between BE characteristics and health status:
  - the prevalence of chronic diseases, and individuals' socio-economic statuses, PA levels, and obesity prevalence, assessed by Body Mass Index (BMI).
    - individuals with **chronic diseases tend to use green areas for walking more frequently** than those without chronic diseases (59.8% vs. 49.6%; $p > 0.05$).
    - individuals with **a high BMI tend to use parks more frequently,** particularly during the **summer** months.
    - people with **a low BMI tend to walk to urban facilities**, such as markets and fast-food chain stores (94.4% and 89.9%; $p < 0.001$).
    - Availability and accessibility of green spaces significantly affect PA levels; people **with high PA levels stated that they live close to a park** (21,4% and 9,3%; p<0,001).
    - Housing conditions also affected the results. People living **in high-rises are less likely to use these parks than those living in low-rises** (60.0% and 50.0%; $p < 0.001$).

DISCUSSION: POTENTIALS AND CHALLENGES FOR URBAN LIVING ENVIRONMENTS

- Health determinants (WHO, 2018) & the "Health in All Policies" approach
- Health outcomes cannot be attributed solely to the health sector
- Social determinants of health framework highlights the significant impact of income, age, environmental quality, and social support mechanisms on health evidence-based research supports a holistic framework that enables the development of healthier societies by transforming the social and physical environments in which individuals live.
- The focus should be at the community level rather than solely on individual behavioral change

Thank you!

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AESOP 2025 CONGRESS

Istanbul, 7-11 July

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