



impacTEEN
A Policy Research Partnership
for Healthier Youth Behavior

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The Impact of Policy and Environmental Factors on Physical Activity and Weight Outcomes

Presentation will focus on:

Data Sources:

1. ImpacTeen original community-level data collections in communities around the MTF schools
2. Existing archival data sources:
 - *Census data (TIGER files, demographic information)*
 - *Dun & Bradstreet business lists*
 - *Aerial Photographs*
 - *ESRI Street Maps*
 - *GNIS (Geographic Names Information Systems)*
3. Results of Analyses using these data
4. Future data collection efforts and analysis
5. Resource document for researchers



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Built Environment Data Collection Efforts

ImpacTeen Data

ImpacTeen original community-level data collections in communities around the MTF schools

- *1999-2003; approximately 950 communities*
- *focused on alcohol, tobacco, and illicit drug use*
- *combination of observations and key informant surveys*
- *plans to resume with obesity focus in 2009*

Catchment area, or community, was defined based on the school enrollment zone

- *70% defined using school district map*
- *17% based on student home zip code*
- *9% based on radius around the school*
- *4% based on algorithm*

ImpacTeen Community Data

Community Outdoor observations include presence of :

- *Sports areas (baseball diamonds, basketball and tennis courts, soccer fields, etc.)*
- *Parks and green spaces*
- *Public pools and beaches*
- *Bike paths/lanes*
- *Neighborhood gardens*
- *Attractive community spaces (trees, flowers, shrubs)*
- *Bike lanes on roads*
- *Curbs and sidewalks*
- *Street lighting around school and in neighborhood*
- *Traffic density around school and in neighborhood*

ImpacTeen Community Data

Area Deprivation measures include presence of :

- *Homeless persons loitering on the street*
- *Bars on windows*
- *Dilapidated buildings, unkempt lawns*
- *Security barriers around residential and retail property*
- *Teens smoking or drinking*
- *Vandalism and/or graffiti*

ImpacTeen Community Data

ArcGIS measures include:

- *Population density per sq. mi. for the catchment area*
- *Housing density per sq. mi. for the catchment area*
- *Intersection density per sq. mi. for the catchment area*
- *Ratio of 4-way intersections per catchment area*
- *Ratio of higher road classes to local and neighborhood roads (measure of street safety)*



Archival Data:

- Dun & Bradstreet MarketPlace Database
 - List of more than 14 million US businesses
 - Updated quarterly
 - More than 1,300 D&B staff
 - Yellow page directories
 - News and media sources
 - Government registries
 - Websites
 - Verified with telephone interviews
 - Variety of quality control procedures to avoid duplication, minimize errors, etc.
 - Accessed through licensed D&B MarketPlace software
- 



Archival Data Cont'd:

- Dun & Bradstreet MarketPlace Database
 - Multiple criteria included
 - Standard Industry Classification codes
 - » Primary and secondary codes reported
 - addresses
 - Contact information
 - Company size
 - More
 - Data matched to MTF surveys based on zip code of the MTF school and first quarter D&B data on outlets for that zip code





Archival Data Cont'd:

– Physical activity related outlets

- At 4 digit SIC level, identified:

- Physical fitness facilities

- » health clubs, spas and others featuring exercise and other physical fitness activities, both membership and non-membership

- Membership sports and recreation clubs

- » Ice, court, country, golf, tennis, amateur sports, yacht, and recreation clubs

- Dance studios, schools, and public dance halls

– Food store outlet density measures

- Used 6 digit SIC codes to identify

- Chain supermarkets, Non-chain supermarkets, Convenience stores, Grocery stores



Aerial Photographs



Example: Traffic Circle



Example: Water Barrier



Example: Neighborhood Park

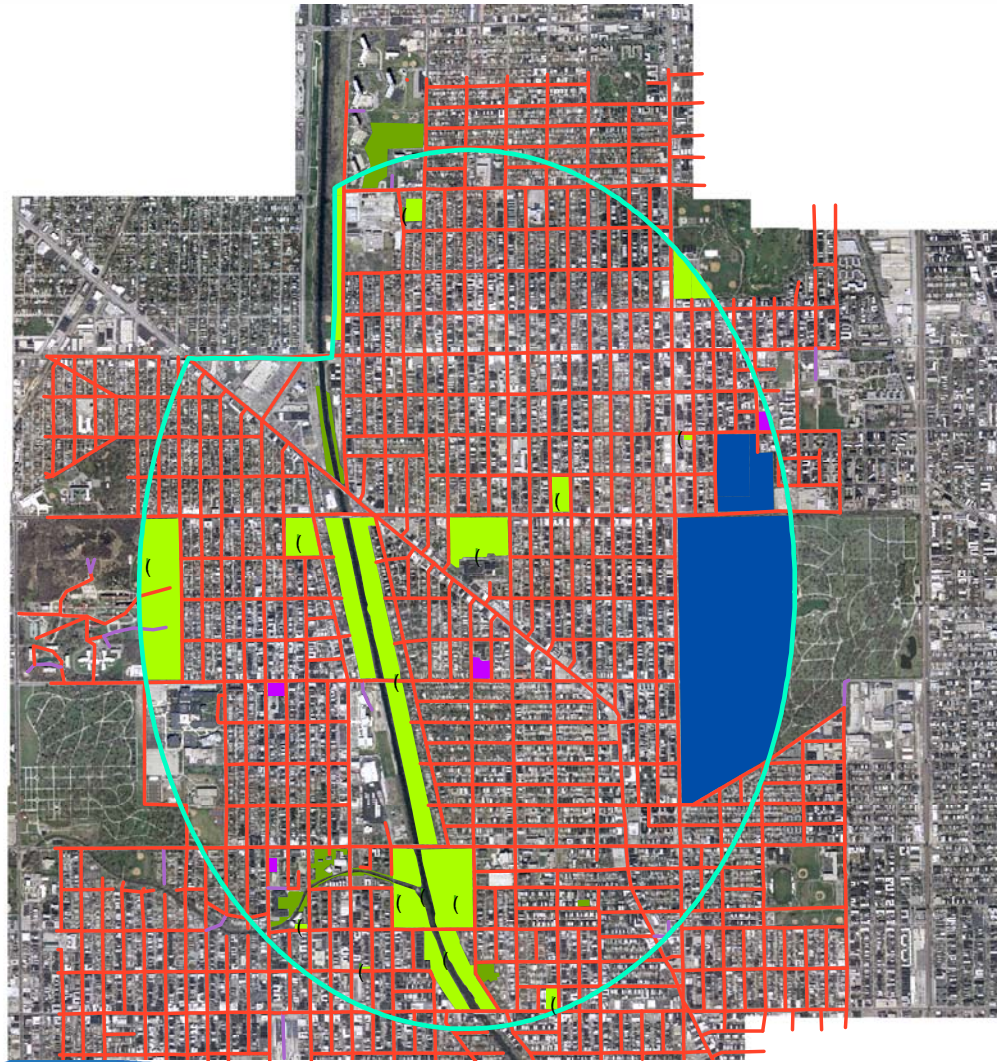


Example: Bike Paths



Example: Sidewalks

Aerial Photographs





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Preliminary Results from the Food and Fitness Survey




Food and Fitness Survey Results

– Physical Education

- 94.6% of schools reported that elementary students are required to take PE classes.
 - 14.9% of schools had PE daily
 - 19% offered PE 3 or 4 times a week
 - 60.4% only offered PE 1 or 2 times a week
 - Average length for a PE class was 39.3 minutes (students active for 75% of class time)

– Most commonly reported barriers to implementing or maintaining regular physical education classes were:

- 24.7% indicated financial constraints/lack of staffing
 - 22.8% indicated inadequate indoor or outdoor facilities
 - 22.0% indicated competing demands for teaching other subject areas
- 




Food and Fitness Survey Results

– Recess


- 86% of the schools reported having recess 5 days per week.
 - average length was 27.8 minutes

– Walking/biking to School

- On average 15.51% of students walk or bike to school.
 - 28.2% of schools indicated that no children walk or bike to school.
 - 27.5% of schools indicated that children were not allowed to bike to school.
 - 21.9% of schools indicated that only children in certain grades were allowed to bike to school.
 - School too far away and traffic danger were the most often cited perceived barriers followed by lack of sidewalks and crossing guards.
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Food and Fitness Survey Results

- No significant differences were found between public and private schools.
 - Lower-SES (>30% free/reduced lunch) public schools were less likely to have daily recess and formal classroom instruction on PA.
 - Lower-SES public schools were more likely to offer daily PE.
 - Higher-SES public schools had greater parental interest in improving physical activity practices.
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Associations between Availability and Community Characteristics

Public Physical Activity Opportunities and Community Characteristics

ImpacTeen Community Observation Data

- 2002/03 data on sports areas, parks/green spaces, playgrounds, public pools & beaches, bike paths/lanes; overall index (409 communities)
- Census data on community characteristics (race/ethnicity, income, poverty, urbanization)
- Found fewer physical-activity related settings in communities with lower income levels and higher percentages of African Americans

Commercial Physical Activity Opportunities and Community Characteristics

Business List Data

- Dun & Bradstreet 2000 zip code level data on variety of paid physical activity related outlets
 - *physical fitness facilities, memberships sports and recreation clubs, and dance studios/schools/halls (28,050 zip codes)*
- Census data on zip code population characteristics
 - *race/ethnicity, income, poverty, urbanization*
- Found fewer paid physical-activity related settings in communities with lower income levels and higher percentages of African Americans and (for some settings) Hispanics



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Associations between Availability and Youth Behavior and Weight Outcomes

Physical Activity Opportunities and Youth Behavior

- Dun & Bradstreet zip code level data on paid physical activity related outlets
 - physical fitness facilities, memberships sports and recreation clubs, and dance studios/schools/halls
- MTF data on student reports of physical activity, height and weight (1997-2003)
 - frequency of participation in sports, athletics, and exercise; BMI, and indicator for overweight

Physical Activity Opportunities and Youth Behavior

- Find that:

- youth in communities with greater availability of paid physical activity related outlets more likely to report frequent physical activity (exercise and sports participation)

- Some differences by gender (greater impact on girls) and grade (greater impact on 12th graders)

- Increasing number of outlets from low end (1 facility) to high end (8 facilities) associated with 6.6% increase in frequent physical activity and 9.0% increase in frequent vigorous exercise among 12th grade girls

- Comparable change associated with 6.4% increase in frequent vigorous exercise among 12th grade boys

Physical Activity Opportunities and Youth Behavior

- Related findings

- youth in communities with greater availability have lower BMI and are less likely to be overweight

- Small effect – one more outlet per 10,000 population reduces probability of overweight by $\frac{1}{2}$ percentage point (about 5 percent reduction)

Physical Activity Supports and Youth Behavior

- Built Environment Measures
 - area deprivation scale, outdoor PA settings scale, commercial PA facilities, student perception of safety, local sprawl index, street safety
- MTF data on student reports of physical activity, height and weight (2001-2003)
 - frequency of vigorous exercise; participation in sports, athletics, and exercise; indicator for overweight, and BMI

Source: Slater, et al., www.impactteen.org, 2007

Physical Activity Supports and Youth Behavior

- Find that:

- Higher levels of area deprivation were significantly associated with reduced PA participation and higher prevalence of overweight and BMI.

- Presence of bike paths was significantly associated with lower prevalence of overweight and BMI.

- Greater numbers of commercial PA facilities were significantly associated with increased vigorous exercise and PA participation.

Source: Slater, et al., www.impactteen.org, 2007

Physical Activity Supports and Youth Behavior

- Find that:
 - Students' perception of feeling unsafe going to and from school was significantly associated with decreased vigorous exercise.
 - More compact neighborhoods were associated with reduced PA participation and lower prevalence of overweight and BMI.

Source: Slater, et al., www.impactteen.org, 2007

Physical Activity Supports and Youth Behavior

- Gender differences showed:
 - Higher levels of area deprivation were significantly associated with reduced female PA participation.
 - Greater numbers of commercial PA facilities were significantly associated with increased female PA participation.
 - More compact neighborhoods were associated with reduced BMI scores for males.

Source: Slater, et al., www.impactteen.org, 2007

Physical Activity Supports and Youth Behavior


Results of Predicted Probability Models

Independent Variables	Vigorous Exercise	PA Participation	Overweight	BMI
Area Deprivation=0		+1.4%	-10.2%	-1.0%
Bike Paths =1			-9.5%	-1.0%
Commercial PA Facilities=8	+1.5%	+2.0%		
Commercial PA Facilities=16	+6.3%	+8.1%		
St. Perception of Safety=0	+4.4%			
Local Sprawl Index=80		+3.1%		
Local Sprawl Index=125			-11.8%	-1.1%
Local Sprawl Index=175			-33.7%	-3.3%
Total Effect	10.9%	14.9%	-44.7%	-4.2%

Source: Slater, et al., www.impactteen.org, 2007



Limitations

- Potential measurement error in self-reported PA and weight outcomes
 - Some evidence of under-reporting; other studies find mostly accurate
 - Limited measures of physical activity
 - Measurement error in observation and outlet density measures matched by school not student location
 - Cross-sectional data can't establish causality
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2009 ImpacTeen Community Observations

- Results of these analyses will help inform the development of observation instruments for upcoming data collection.

Plan to collect information on:

- Availability of and access to physical activity settings and food outlets.
- Specific attributes and overall condition of commercial and outdoor physical activity settings.
- Presence of sidewalks, traffic calming measures, mixed-land use, street connectivity, traffic density, street lights, area deprivation
- User cost for paid physical activity settings
- Availability of and access to restaurants and food stores
- Prices for food products in stores and restaurants
- Retail marketing of food products



ImpacTeen Resource for Researchers

**“An Assessment of Environmental
Influences Associated with Overweight
and Obesity: An Inventory of Existing
Surveillance Systems”**





Purpose of the paper:

- Identifies existing national data sources for use in obesity-related research including:
 - Data sources that contain individual level measures
 - Contextual data sources
 - Provides a summary of the database and whether it contains information on:
 - BMI
 - Nutrition
 - Physical activity
 - Geocode
 - Provides a discussion about the challenges researchers must consider when using these data, such as issues related to weaknesses in the measures, data linkage, data comparability, and missing information.
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