

How Community Design and Greenspace Impact Public Health

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Disclaimer

The findings and conclusions in this presentation are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention.

What is Health?

What is Health?

- Health is the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity - World Health Organization

Quiz:

Which Environment Promotes Health?



Major Message

- Greenspaces are critical elements of a health-promoting community.

The Evidence that Parks and Greenspaces Promote Health

- **Obesity and physical inactivity**
- **Environmental health**
- **Mental health**
- **Wellness**



The image shows the front cover of a Newsweek magazine. The background is a photograph of a young boy with short brown hair, wearing an orange t-shirt, holding a large ice cream cone with white vanilla ice cream and colorful sprinkles. The magazine's masthead 'Newsweek' is partially visible at the top left. In the top right corner, there is a blue diagonal banner with white and yellow text. The main headline 'Fat for Life?' is printed in large white letters across the middle of the cover. Below it, a sub-headline in white and yellow text discusses childhood obesity. At the bottom, the authors' names are listed in white text.

Newsweek

July 1, 2006 \$5.00

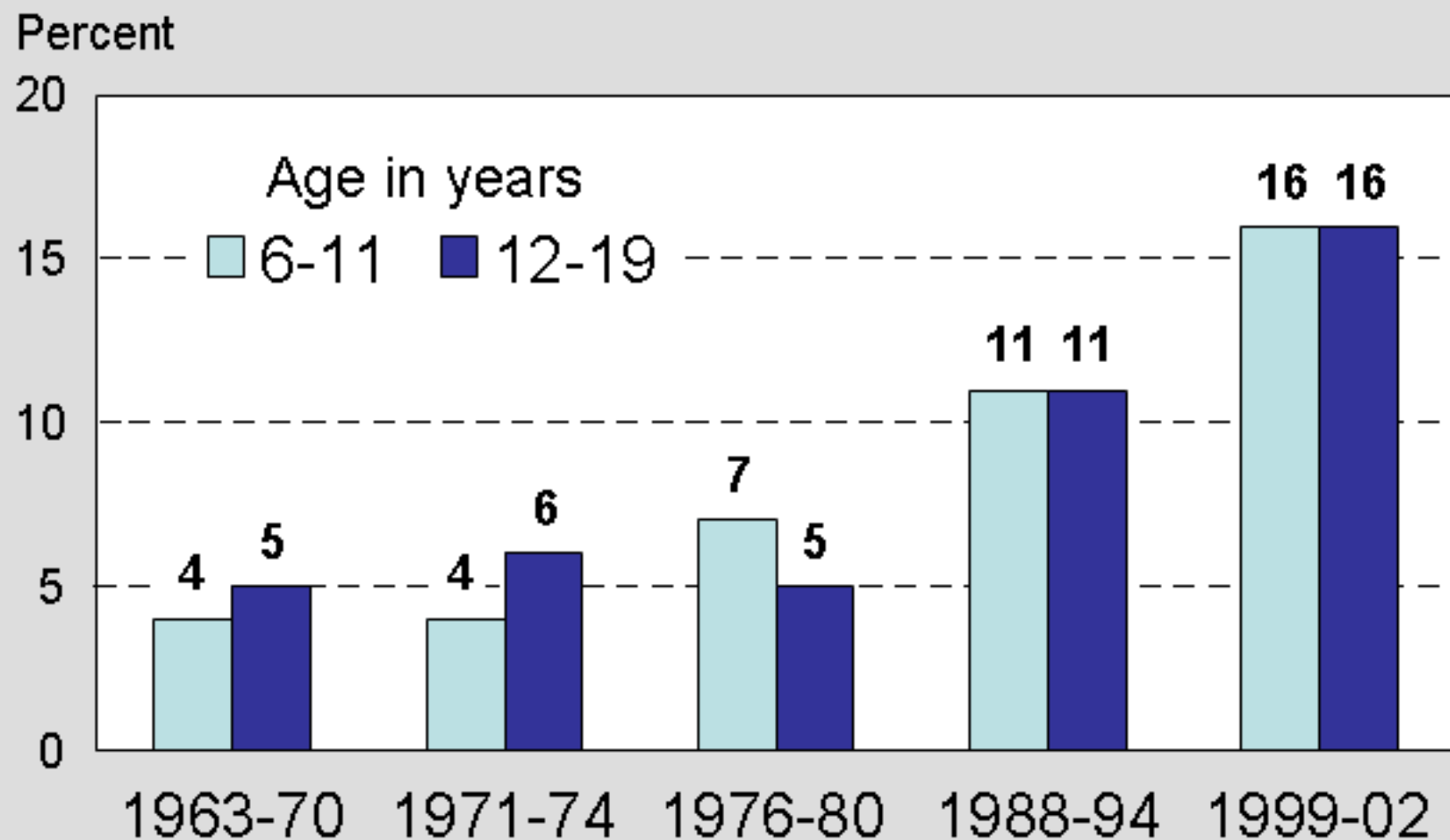
**LIES ABOUT
SOCIAL
SECURITY
BY ALLAN
SLOAN**

Fat for Life?

**Six Million Kids
Are Seriously Overweight.
What Families Can Do.**

By Geoffrey Cowley & Sharon Begley

Figure 1. Prevalence of overweight among children and adolescents ages 6-19 years



NOTE: Excludes pregnant women starting with 1971-74. Pregnancy status not available for 1963-65 and 1966-70. Data for 1963-65 are for children 6-11 years of age; data for 1966-70 are for adolescents 12-17 years of age, not 12-19 years.

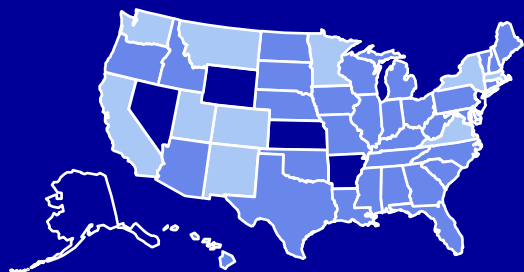
SOURCE: CDC/NCHS, NHES and NHANES

Obesity Trends* Among U.S. Adults

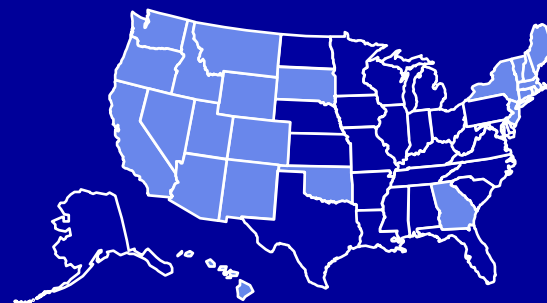
BRFSS, 1990, 1995, 2000, 2005

(*BMI ≥ 30 , or about 30 lbs overweight for 5'4" person)

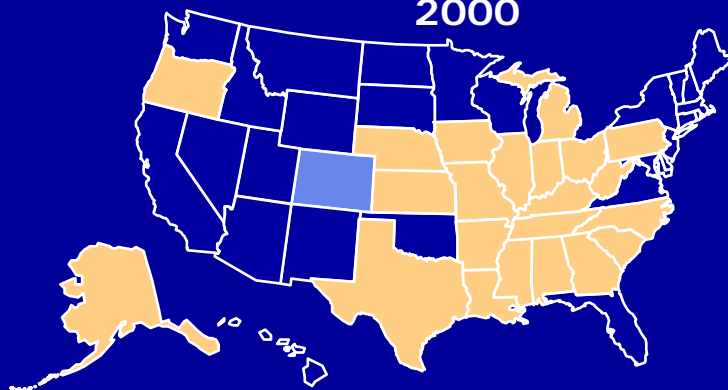
1990



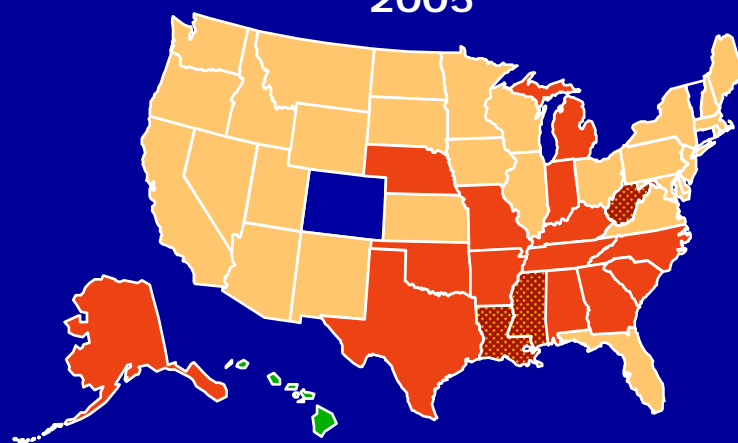
1995



2000



2005



Legend: No Data, <10%, 10%–14%, 15%–19%, 20%–24%, 25%–29%, $\geq 30\%$

Inactivity, Overweight and Health

Evidence links inactivity and overweight with...

Cardiovascular disease	✓
Cancers	✓
Depression	✓
Osteoporosis	✓
Hypertension	✓
Increased mortality	✓

Cost of Obesity

- Sixteen percent of our GDP is spent on medical care.
- Increases in obesity accounted for 27% of the increased cost of health care spending between 1987 and 2001.

» Thorpe. Health affairs. 2004



• CANINE CONSTITUTIONAL



A brisk walk in the park keeps Macey in shape between dog shows. His owner, Columbus resident Cathy Stumbo, got up early to give her 3-year-old Doberman Pinscher a morning walk, typically log 10 miles in Berline's



Determinants of Physical Activity

More likely to exercise if:

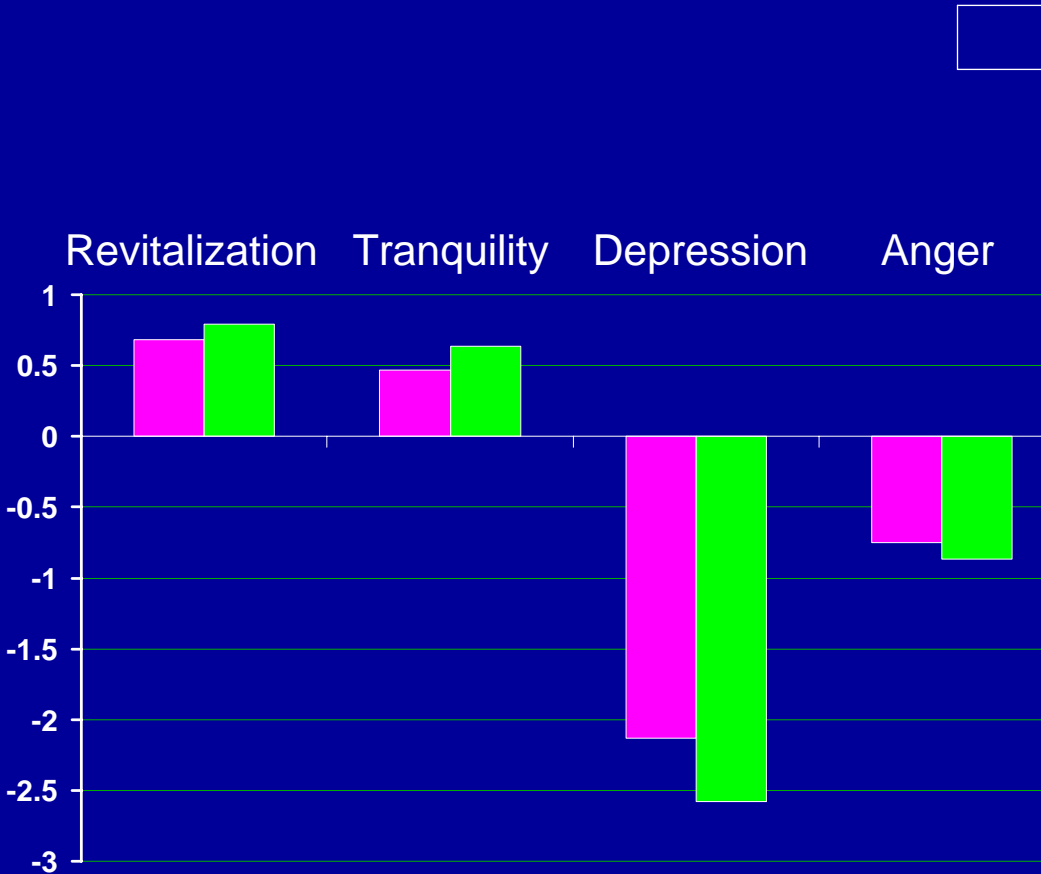
- Walking trails, parks and gyms accessible
- Sidewalks present and scenery enjoyable
- Many people exercising
- Friends available with whom to exercise

Less likely to exercise if:

- Too little time
- Too tired
- Unmotivated
- Perceived traffic, crime or other danger
- Long distance to exercise location

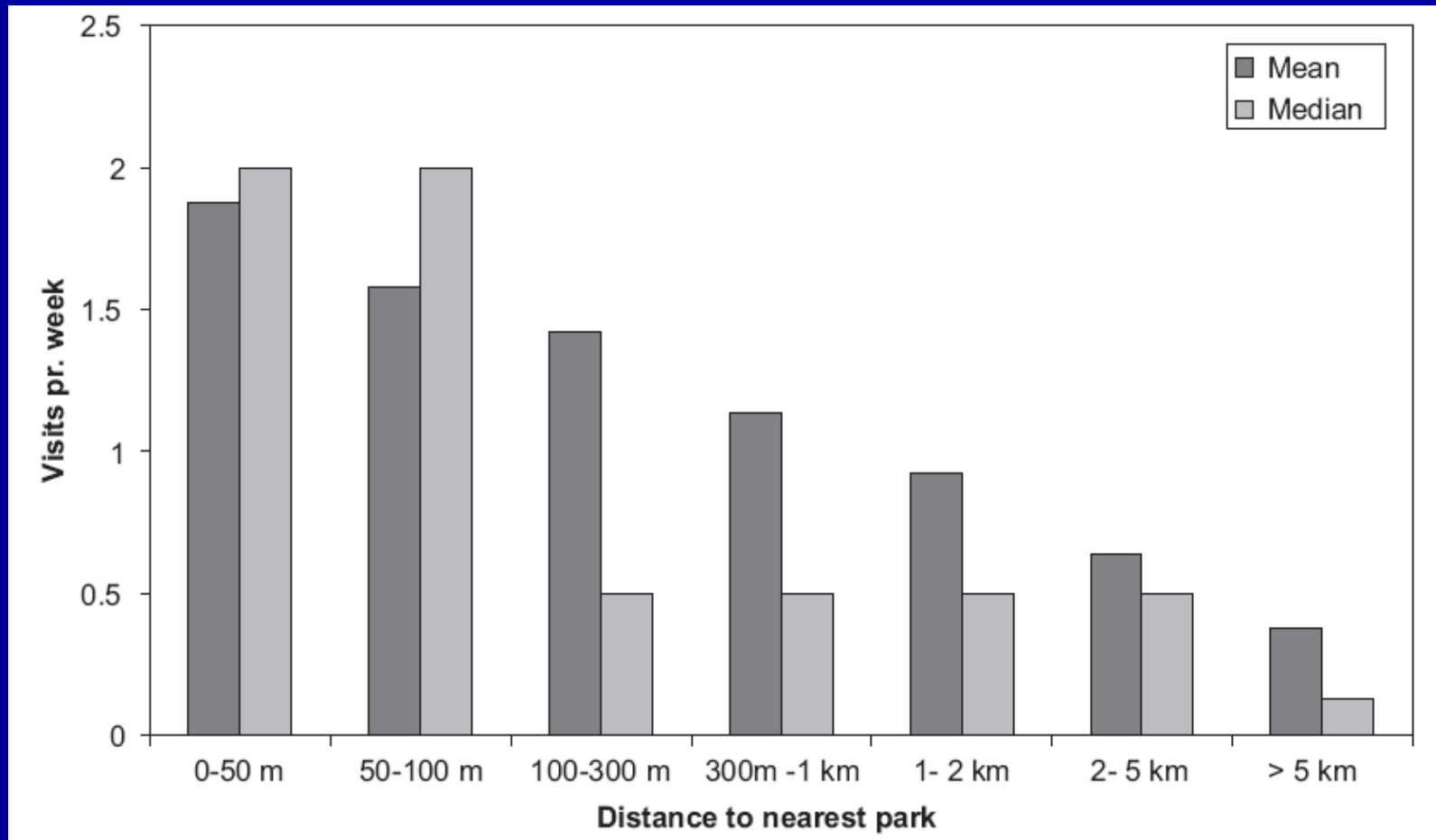
• Source: Brownson RC et al, *AJPH* 91:1995, 2001
• HealthStyles Survey, 1999

Green exercise



Bodin and Hartig, *Psychol Sport Exercise* 2003;4:141-53

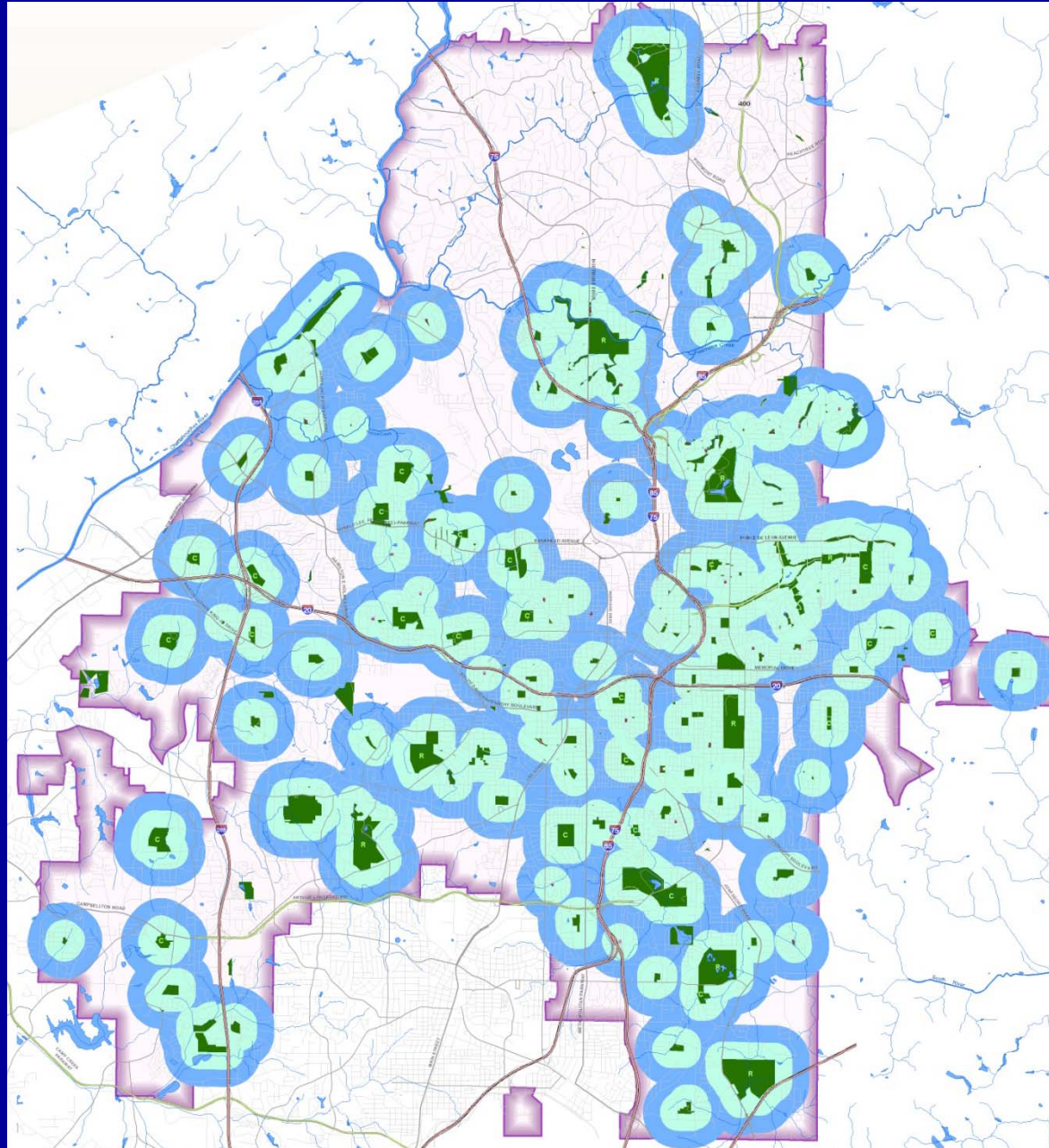
Mean and Median Use per Week by Distance to Nearest Park: Large Urban Parks in the Summer



Nielsen, et al. 2007

Park Access

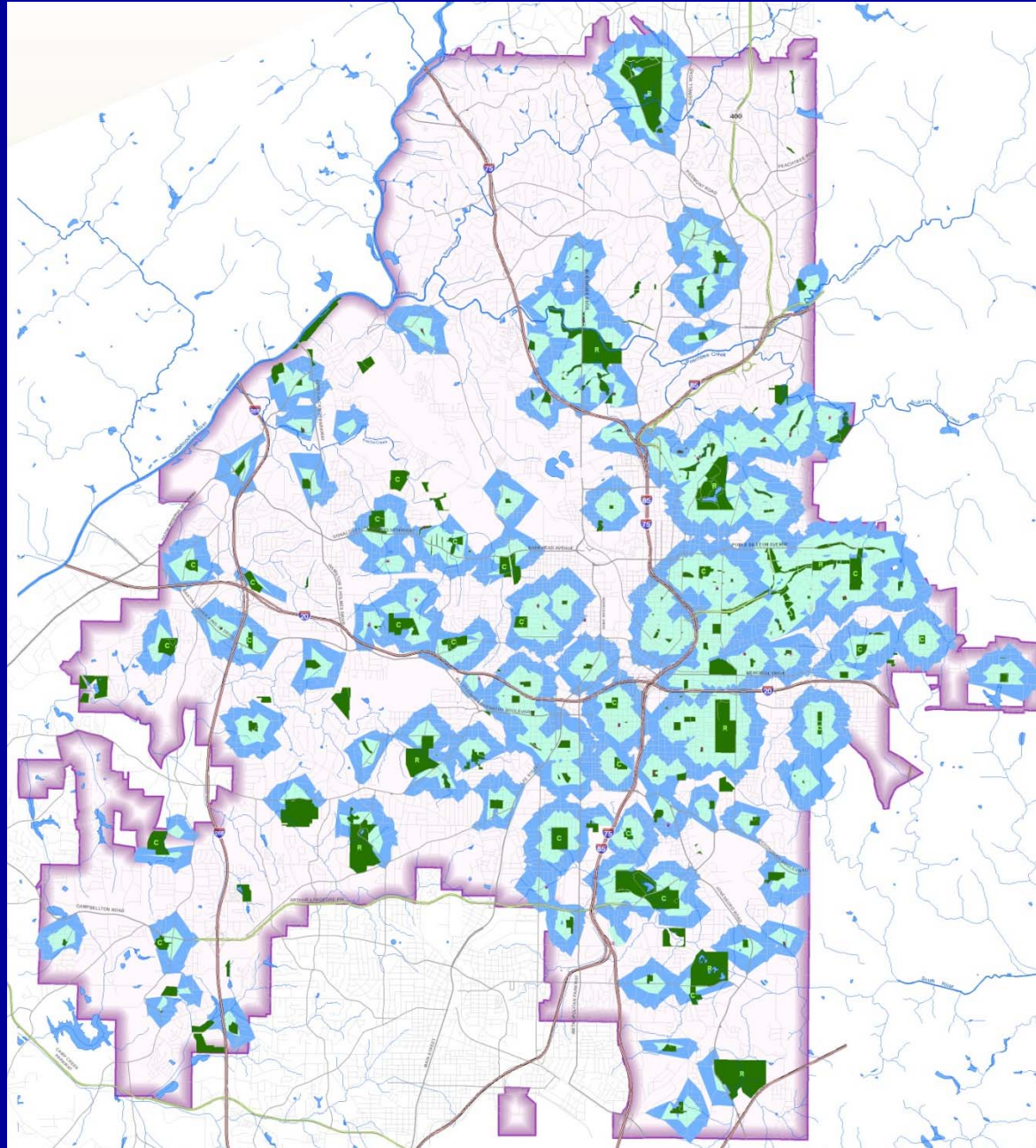
- “As a crow flies”
- % of Population
- $\frac{1}{4}$ mile = 40%
- $\frac{1}{2}$ mile = 74%
- However....



Park Access

- Via Street Network
- % of Population
- $\frac{1}{4}$ mile = 20%
- $\frac{1}{2}$ mile = 47%

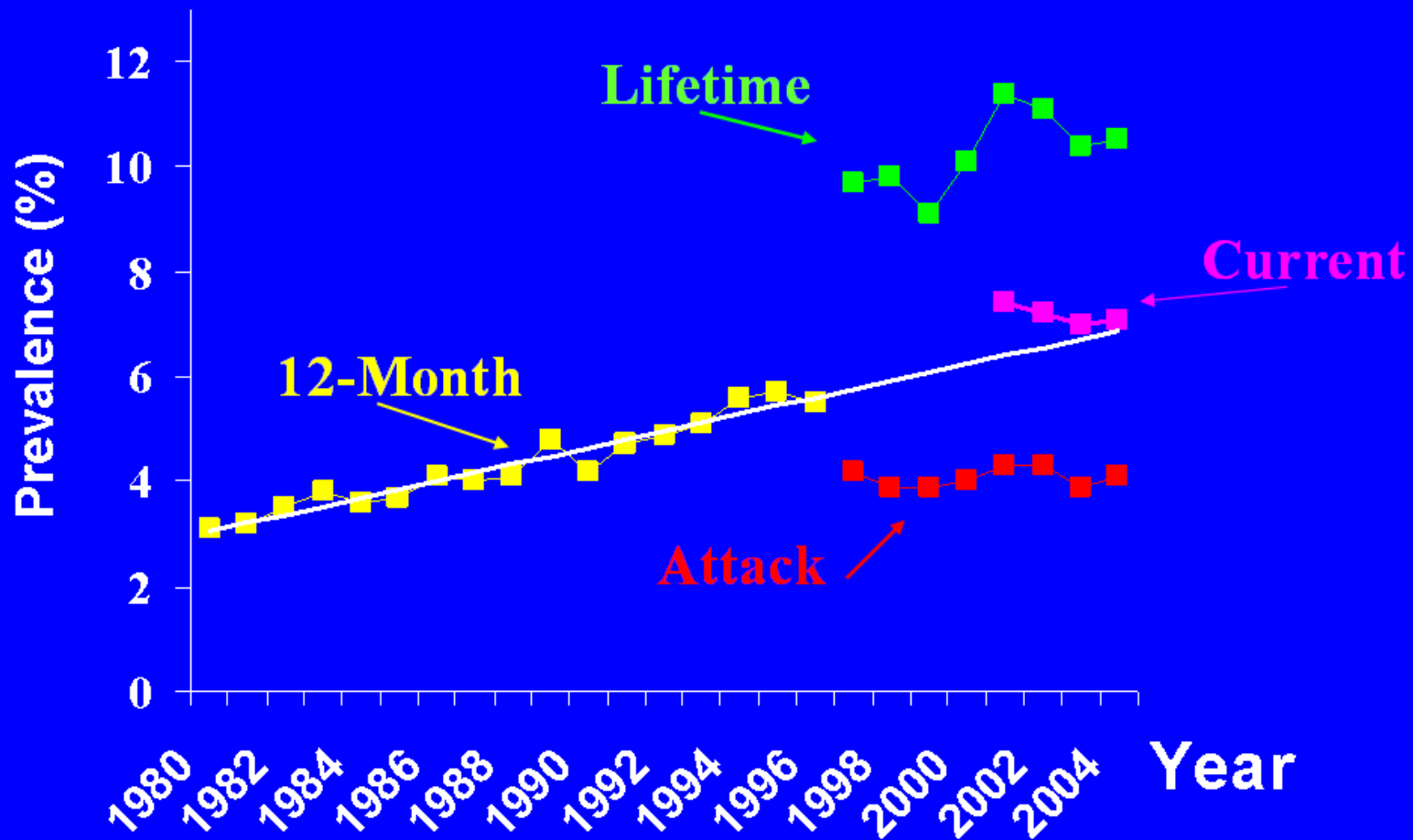
Source: Center for Geographic Information Systems, Georgia Institute of Technology



Environmental Health

Asthma Prevalence

United States, 1980-2004



Source: National Health Interview Survey; National Center for Health Statistics

Greenspace and Air Quality: Evidence

- Trees remove particulate matter
 - Beckett. Environmental Pollution. 1998.
- Children living in areas with more street trees have lower prevalence of asthma
 - Lovasi. Journal of Epi and Community Health. 2008

Health Effects of Climate Change

Climate Change

Temperature Rise ¹
Sea Level Rise ²
Hydrologic Extremes

¹ 2°-8°C by 2100
² 0.5 – 3 m by 2100
IPCC estimates

Adapted from Dr. Jonathan A.
Patz, University of Wisconsin

Urban Heat
Island Effect

Heat stress
Cardiac failure

Air Pollution

Chronic Obstructive
Lung Disease
Asthma

Vector-borne
Diseases

Malaria
Dengue fever
Encephalitis
Hantavirus pulmonary syn.
Rift Valley Fever

Water-borne
Diseases

Cholera
Cyclosporiasis
Cryptosporidiosis
Campylobacteriosis
Leptospirosis

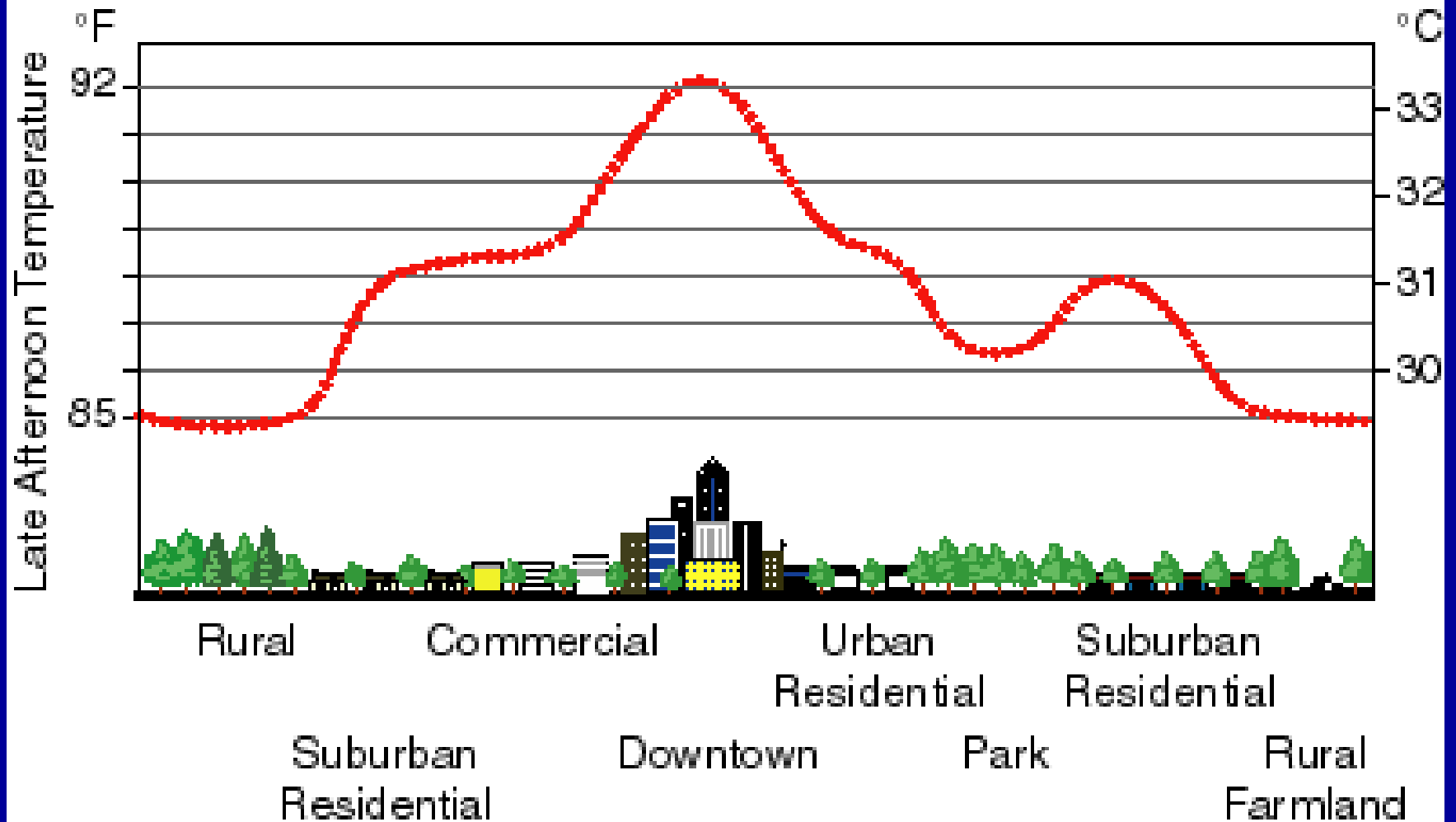
Water
Resources &
Food Supply

Malnutrition
Diarrhea
Red Tide

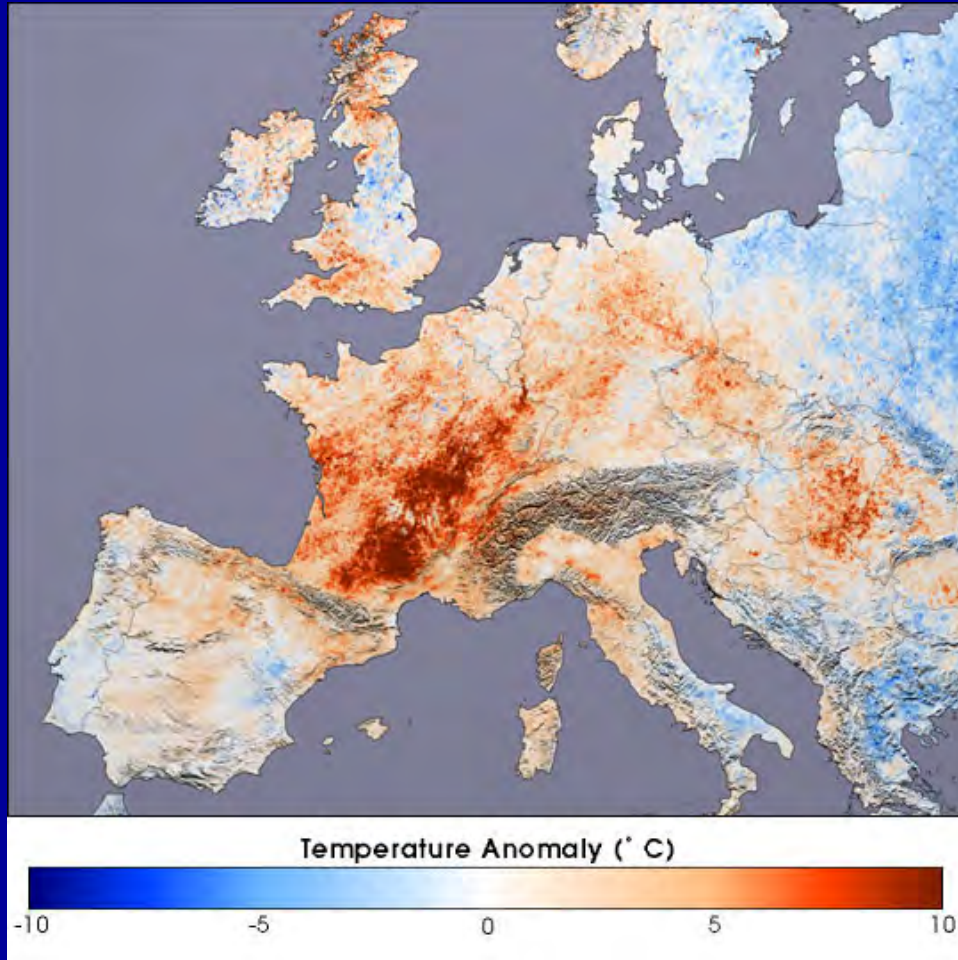
Environmental
Refugees

Overcrowding
Infectious disease
War

Sketch of an Urban Heat-Island Profile



The European Heat Wave of 2003



Excess deaths	
France	14,802
Germany	7,000
Spain	4,230
Italy	4,175
UK	2,045
Netherlands	1,400
Portugal	1,316
Belgium	150
TOTAL	35,118

Mental Health

Better Attention

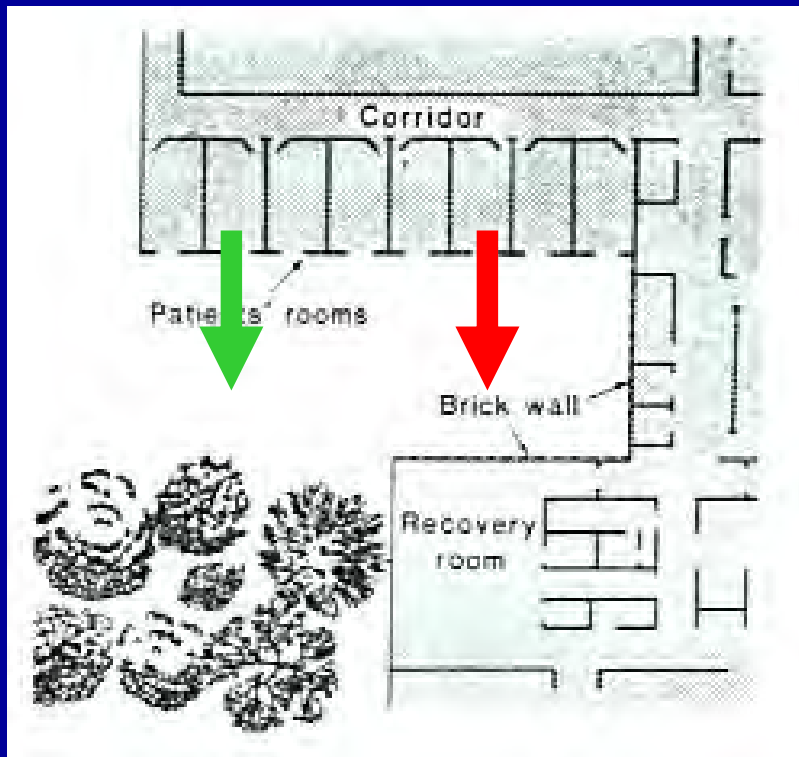
- Playing in natural settings reduced ADHD symptoms more than other play settings.
 - Kuo and Taylor, *American Journal of Public Health*. 2004
- College students with more natural views from their dorm window had better levels of attention.
 - Tennessen and Cimprich. *Journal of Environmental Psychology*. 1995.
- Apartment dwellers with views of nature reported better concentration.
 - Kaplan. *Environment and Behavior*. 2001.

Reduced Stress

- Stress recovery is faster when viewing nature
 - Ulrich, et al. *Journal of Environmental Psychology*. 1991.
 - Parsons, et al. *Journal of Environmental Psychology*. 1998.
- Children with more nature in the home environment recover from stress faster
 - Wells and Evans. *Environment and Behavior*. 2003.

Wellness

Recovery from surgery



- All cholecystectomies in a Pennsylvania hospital, May-October, 1972-1981
- Exclusions: age <20 or >69 ; serious complications; history of psychological problems
- Matched pairs: “tree view” patients with “brick wall view” patients

Recovery from surgery

Results: The “tree view” patients had

- shorter hospitalizations (8.70 days vs 7.96 days)
- less use of analgesic medications
- fewer negative nurse notes (e.g. “needs much encouragement,” “upset and crying”)

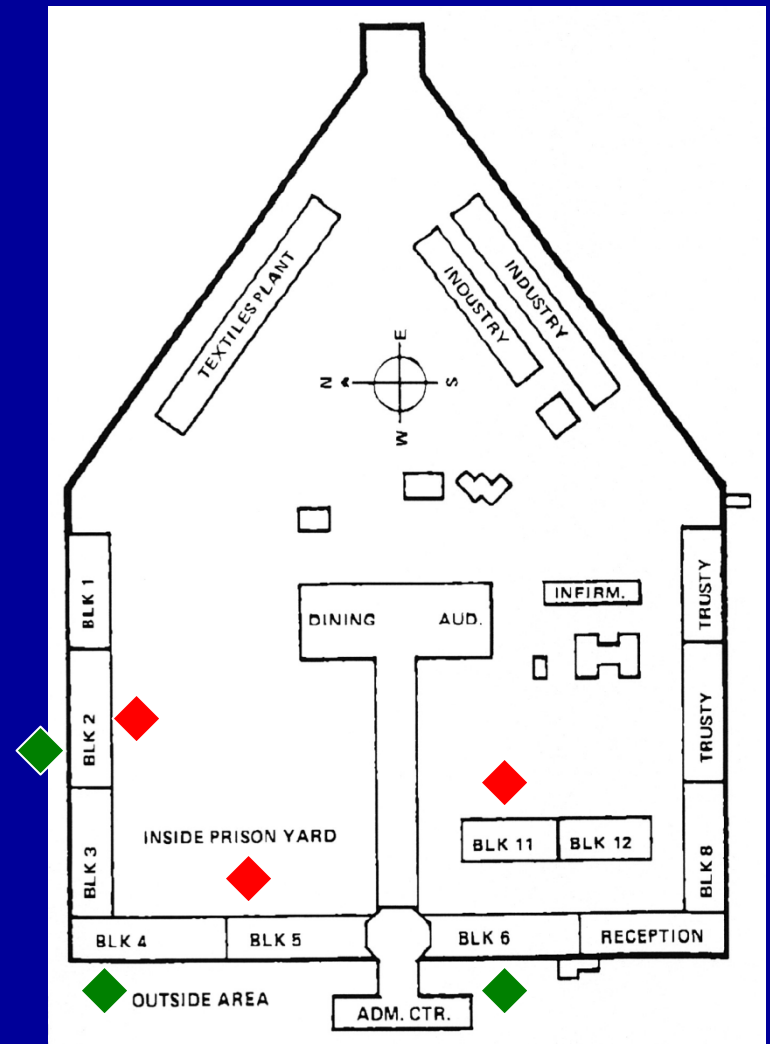
Ulrich, *Science*, 1984

Health among prisoners

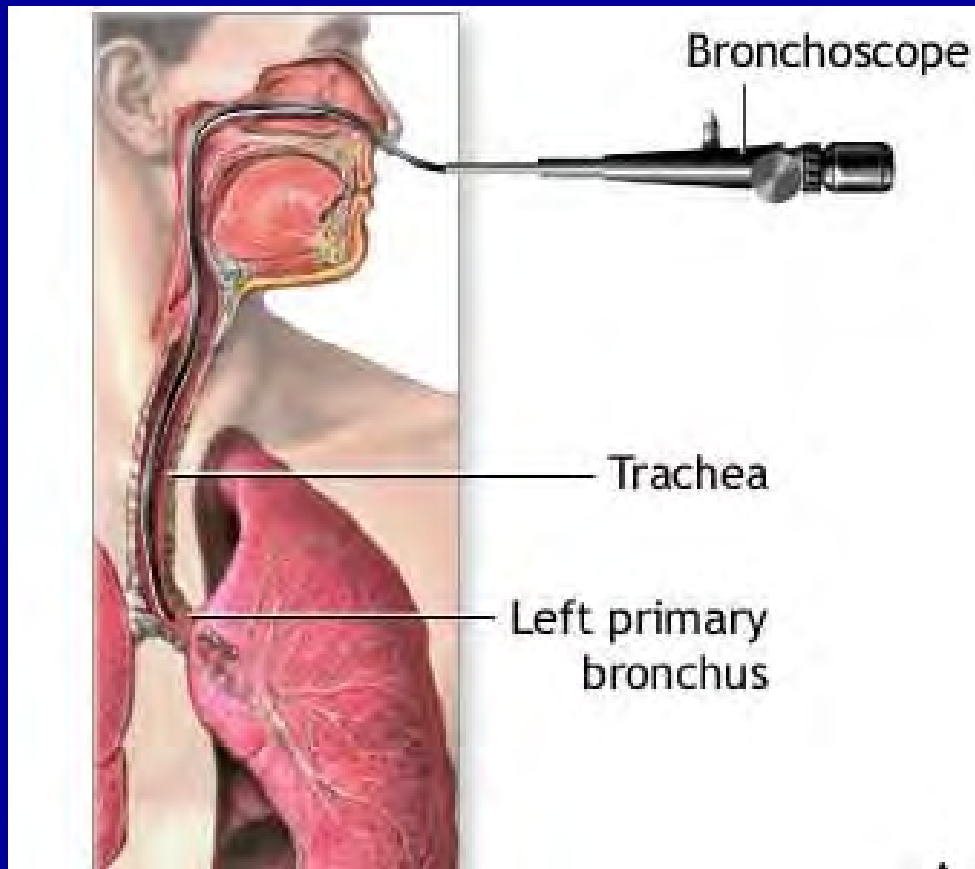
State Prison of Southern Michigan, 1978:

Sick call attendance from **inside** cells was 24% higher than from **outside** cells

Moore, *J. Env. Systems*, 1981-2



Nature and Bronchoscopy



Bronchoscopy Pain Control

80 patients undergoing bronchoscopy

40

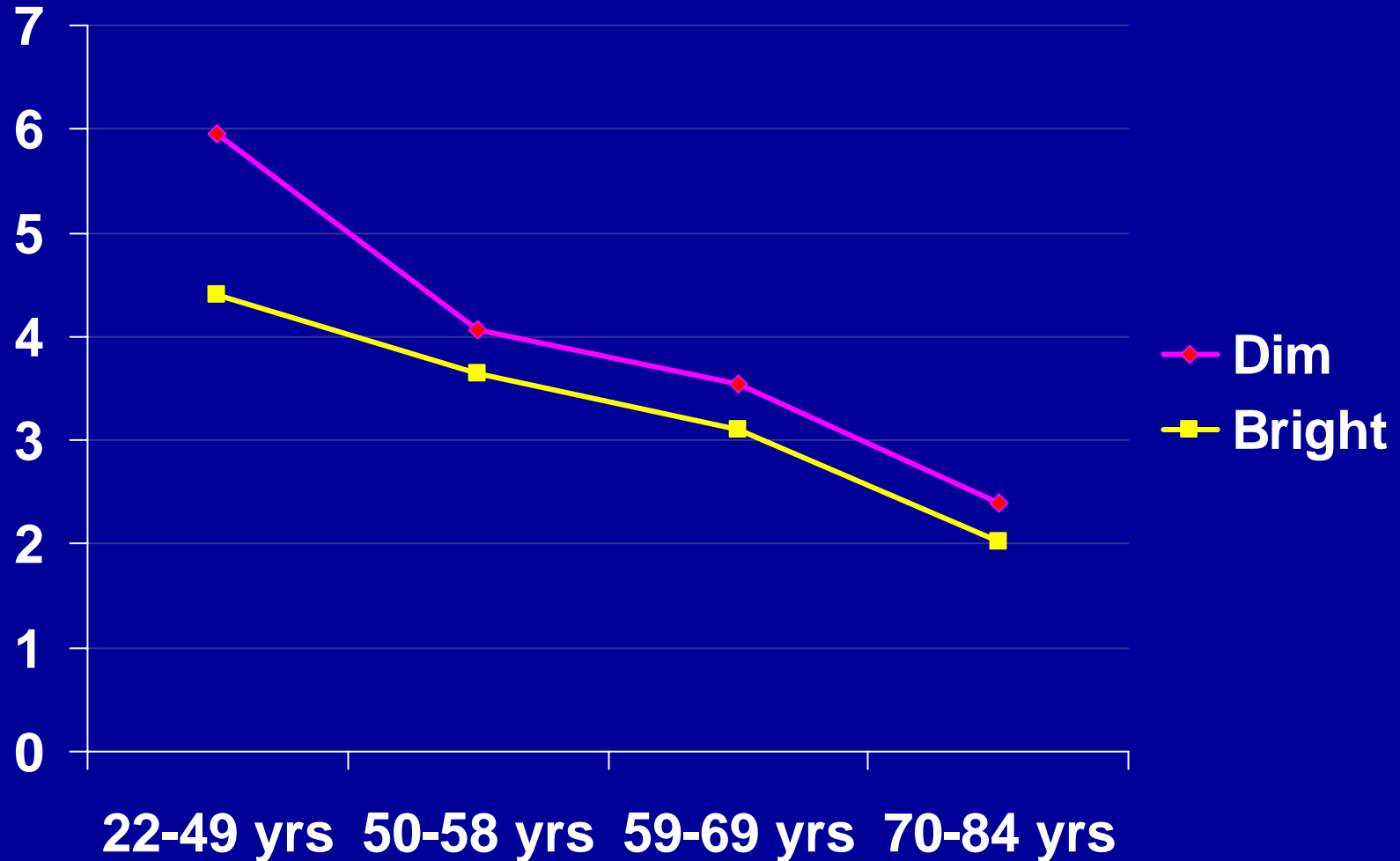


29.3% with "very good" or "excellent" pain control

40 controls

20.5% with "very good" or "excellent" pain control

Spinal surgical patient opiate use by bright or dim side of hall



Trees and Urban Life

Studies in Robert Taylor Homes, Chicago

- 28 identical high-rise buildings along a 3-mile corridor
- Some have nearby vegetation, others do not
- Residents randomly assigned to apartments

University of Illinois
Human-Environment Research Lab
William Sullivan, Frances Kuo
<http://www.herl.uiuc.edu/>







Robert Taylor Homes Interview Study

- People living in buildings with trees
 - Knew more neighbors
 - Were more social
 - Experienced less domestic violence



Child Development

- Kids who play outside have 2x the friends
 - Huttenmoser. *Children's Environments*. 1995

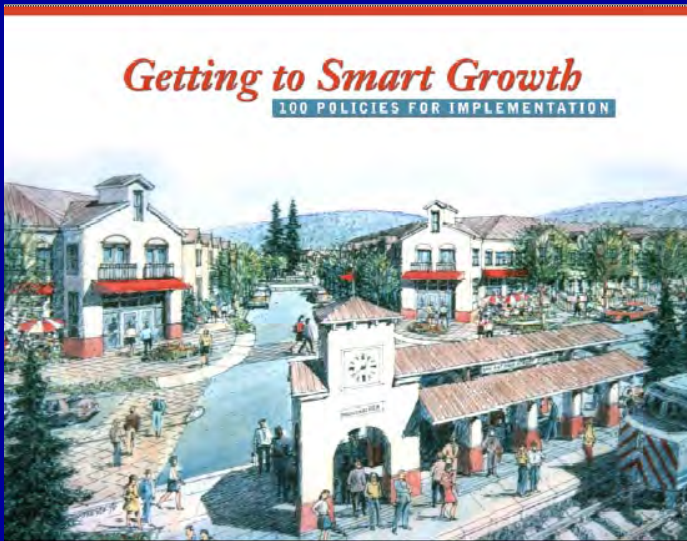
Integration of Parks and Greenspaces into Healthy Communities

Foreseeable realities

- The population will be:
 - Larger
 - Older
 - More diverse
- Physical constraints will include:
 - Climate change advancing
 - Petroleum increasingly scarce and expensive
 - Water increasingly scarce and expensive
 - Land near cities and towns finite

Healthy, Wholesome Communities: Design principles

- Transportation alternatives
- Density
- Mixed land use
- Parks and green spaces



Synergies: Transportation Space



Cars



Bus

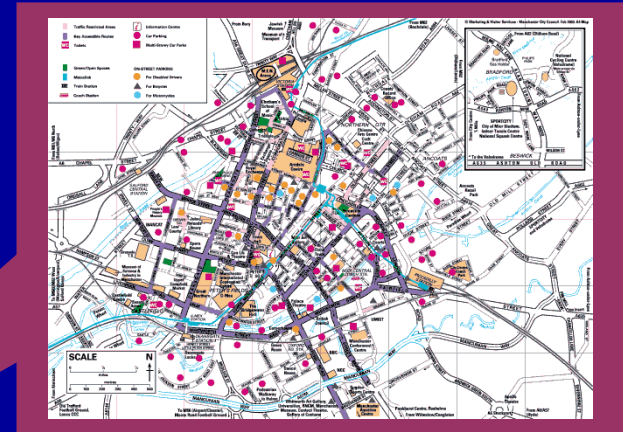


Bicycles

Partnerships

- Other Federal, state, and local government agencies
- Non-Governmental Organizations (NGOs)
- Academic/Public Health programs
- Networking across disciplines

Research



Social Marketing

Social Marketing



+



Surveillance

- Defining the baseline
- Resources
 - www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm
 - www.cdc.gov/nceh/tracking
 - <http://www.srs.fs.usda.gov/trends/Nsre/nsre2.html>

Health Impact Assessment

- What will the health effects be?
- Resources
 - www.cdc.gov/healthyplaces/hia
 - www.childrenandnature.org/research/Intro

Listing of non-government sites does not imply endorsement or responsibility for content

Evaluation

- Does the project meet its goals?
- Resources
 - www.cdc.gov/eval
 - www.meera.org

Listing of non-government sites does not imply endorsement or responsibility for content

Envisioning Change





Creating Special Places



**Community design and
land use choices can
either promote or harm human health**

**www.cdc.gov/healthyplaces
www.epa.gov/smartgrowth**