Economic Cost of Physical Inactivity

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IUSM Dept of Public Health
Outline

• Obesity

• Physical activity
  – Trends in physical activity
  – Benefits of physical activity

• Costs of physical inactivity

• Physical activity guidelines

• Sources and resources

Physical Activity for Everyone
OBESITY

Physical Activity for Everyone
Obesity Trends Among U.S. Adults between 1985 and 2007

Definitions:

• Obesity: Having a very high amount of body fat in relation to lean body mass, or Body Mass Index (BMI) of 30 or higher.

• Body Mass Index (BMI): A measure of an adult’s weight in relation to his or her height, specifically the adult’s weight in kilograms divided by the square of his or her height in meters.
Obesity

• What has happened?
  – Caloric banking

• Reasons
  – Decrease in physical activity
  – Poor diet

  – Others: pollutants, hormones, etc.
Obesity

- Change in physical activity
  - Suburbia
  - Use of exosomatic organs (technology)

- Change in diet
  - Cheap food
    - Low nutrition, high in calories
  - Eating out

- Markets
  - Growth and advergamming
Obesity Trends Among U.S. Adults between 1985 and 2007

Source of the data:

- The data shown in these maps were collected through CDC’s Behavioral Risk Factor Surveillance System (BRFSS). Each year, state health departments use standard procedures to collect data through a series of monthly telephone interviews with U.S. adults.

- Prevalence estimates generated for the maps may vary slightly from those generated for the states by BRFSS (http://aps.nccd.cdc.gov/brfss) as slightly different analytic methods are used.
Obesity Trends* Among U.S. Adults


(*BMI ≥30, or about 30 lbs. overweight for 5’4” person)
Obesity Trends* Among U.S. Adults

• 1990: 10 states had a prevalence of obesity <10% & no states had prevalence ≥15%.
• 1998: no state had prevalence <10% 7 states had a prevalence of obesity between 20-24%, and no state had prevalence ≥25%.
• 2007: One state (CO) had a prevalence of obesity <20%. 30 had a prevalence ≥25%; three of these states (AL, MS and TN) had a prevalence of obesity ≥30%.
Obesity Trends* Among U.S. Adults
BRFSS, 1985
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1986
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1987

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

No Data           <10%          10%–14%
Obesity Trends* Among U.S. Adults
BRFSS, 1988
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1989

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1990
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1991
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
 Obesity Trends* Among U.S. Adults
BRFSS, 1992

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1993
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1994
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1995
(*BMI $\geq 30$, or $\sim 30$ lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1996

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1997
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1998

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends among U.S. Adults
BRFSS, 1999
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2000

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2001

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2002

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2003

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2004

(*BMI ≥30, or ~ 30 lbs. overweight for 5’4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2005

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2006

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2007
(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)

<table>
<thead>
<tr>
<th>No Data</th>
<th>&lt;10%</th>
<th>10%–14%</th>
<th>15%–19%</th>
<th>20%–24%</th>
<th>25%–29%</th>
<th>≥30%</th>
</tr>
</thead>
</table>

Physical Activity for Everyone
NHANES surveys show that among adults aged 20–74 years the prevalence of obesity increased from 15.0% (in the 1976–1980 survey) to 32.9% (in the 2003–2004 survey).

- Children aged 2–5 years, prevalence increased from 5.0% to 13.9%;
- For those aged 6–11 years: 6.5% to 18.8%; and
- For those aged 12–19 years, 5.0% to 17.4%
Physical Activity

• *Physical activity* refers to body movement that is produced by the contraction of skeletal muscle and that substantially increases energy expenditure.

• *Exercise* often refers to planned, structured, and repetitive body movement to improve or maintain one or more components of physical fitness.

IOM 2007. Adequacy of Evidence for Physical Activity Guidelines Development
Benefits of PA

IOM 2007. Adequacy of Evidence for Physical Activity Guidelines Development
Physical Activity, 2007

http://apps.nccd.cdc.gov/PASurveillance/StateSumV.asp

Physical Activity for Everyone
Physical Activity: Bringing it home

<table>
<thead>
<tr>
<th>Recommended</th>
<th>Insufficient</th>
<th>Inactive</th>
<th>No Leisure-Time Physical Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana</td>
<td>47.8</td>
<td>39.6</td>
<td>12.7</td>
</tr>
</tbody>
</table>

**Recommended physical activity** is defined as reported moderate-intensity activities in a usual week (i.e., brisk walking, bicycling, vacuuming, gardening, or anything else that causes small increases in breathing or heart rate) for at least 30 minutes per day, at least 5 days per week; or vigorous-intensity activities in a usual week (i.e., running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate) for at least 20 minutes per day, at least 3 days per week or both. This can be accomplished through lifestyle activities (i.e., household, transportation, or leisure-time activities).

**Insufficient physical activity** is defined as doing more than 10 minutes total per week of moderate or vigorous-intensity lifestyle activities (i.e., household, transportation, or leisure-time activity), but less than the recommended level of activity.

**Inactivity** is defined as less than 10 minutes total per week of moderate or vigorous-intensity lifestyle activities (i.e., household, transportation, or leisure-time activity).

**No leisure-time physical activity** is defined as no reported leisure-time physical activities (i.e., any physical activities or exercises such as running, calisthenics, golf, gardening, or walking) in the previous month.

http://apps.nccd.cdc.gov/PASurveillance/StateSumResultV.asp
COSTS OF PHYSICAL INACTIVITY

Physical Activity for Everyone
Costs of Physical Inactivity

• Types of costs
  – Direct costs
  – Indirect costs
    – Past (sunk) and Current costs
    – Future costs
    – Market price
    – Non-market price
Costs of Physical Inactivity

– Economy-wide
– Health sector
– Health care sector

– Present value
– Future value

– Nominal
– Real
Costs of Physical Inactivity

• In 2000, the health costs of overweight and obesity were estimated at $117 billion (Wolf et al. 2002)
• Physical inactivity contributes to numerous physical and mental health problems and is responsible for an estimated 200,000 deaths per year (CDC 1996)
• Poor diet and physical inactivity contributed to 400,000 deaths in 2000 (16.6%) (Mokdad et al. 2004)
• A national study of 448 metropolitan counties found that people living in sprawling, low-density counties walk less, weigh more and are more likely to be obese or have hypertension (Ewing et al. 2003)
Costs of Physical Inactivity

Table 5  Aggregate Costs: Physical Inactivity & Excess Weight (in billions $)

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>No reduction</td>
<td>542.70</td>
<td>580.14</td>
<td>620.12</td>
<td>662.97</td>
<td>708.70</td>
</tr>
<tr>
<td>5% reduction</td>
<td>515.56</td>
<td>551.13</td>
<td>589.11</td>
<td>629.82</td>
<td>673.26</td>
</tr>
<tr>
<td>Cost-avoidance</td>
<td>27.14</td>
<td>29.01</td>
<td>31.01</td>
<td>33.15</td>
<td>35.44</td>
</tr>
</tbody>
</table>

Physical inactivity costs:  $251.11 billion
Excess weight costs:  $256.57 billion

Chenoweth and Leutzinger . 2006
Costs of Physical Inactivity

• Medical expenses accounted for 9.1% of total U.S. medical expenditures in 1998 (as high as $78.5 billion ($92.6 billion in 2002 dollars))
• About half paid by Medicaid and Medicare.
• Data derived from
  – 1998 Medical Expenditure Panel Survey (MEPS) and
  – 1996 and 1997 National Health Interview Surveys (NHIS)
  – 1998 National Health Accounts

Finkelstein, Fiebelkorn, and Wang, 2003
## Costs of Physical Inactivity

Aggregate Medical Spending, in Billions of Dollars, Attributable to Overweight and Obesity, by Insurance Status and Data Source, 1996–1998

<table>
<thead>
<tr>
<th>Insurance Category</th>
<th>Overweight and Obesity</th>
<th>Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out-of-pocket</td>
<td>$7.1</td>
<td>$12.8</td>
</tr>
<tr>
<td>Private</td>
<td>$19.8</td>
<td>$28.1</td>
</tr>
<tr>
<td>Medicaid</td>
<td>$3.7</td>
<td>$14.1</td>
</tr>
<tr>
<td>Medicare</td>
<td>$20.9</td>
<td>$23.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$51.5</strong></td>
<td><strong>$78.5</strong></td>
</tr>
</tbody>
</table>

Finkelstein, Fiebelkorn, and Wang, 2003
Costs of Physical Inactivity:
Bringing it home!

Indiana

• Obese 27.5% (+/- 0.9)  Rank: 11

• Overweight & obese 62.8% (+/- 1.0)

• Diabetes 8.3% (+/- 0.5)  Rank: 17

• PA 25.5% (+/- 0.8)  Rank: 14

Costs of Physical Inactivity: Bringing it home!


- Total population (15th) 6.0% $1637
- Medicare population 7.2% $379
- Medicaid population 15.7% $522


Costs of Physical Inactivity: Bringing it home!

• Calculating cost of PI
  – Chenoweth and Bortz (2003)
    http://www.ecu.edu/picostcalc/

• Cost data based on meta-analysis of 7 studies
  – CA, MA, MI, NC, NY, TX, and WA

  1) medical care,
  2) workers’ compensation, and
  3) lost productivity.
1) Medical care costs

- Number and payments for inpatient and outpatient claims, ratio of inpatient to outpatient claims and payments, risk factors associated with each of the targeted conditions, risk factor (epidemiological) weights for each risk factor, and percentage of adults with a specific risk factor.
1) Medical care costs

<table>
<thead>
<tr>
<th>SECTION I</th>
<th>Major Diagnostic Categories</th>
<th>All MDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>COST UNIT VARIABLE</td>
<td>Breast and Colon Cancer</td>
<td>Circulatory</td>
</tr>
<tr>
<td>A. 7-state$distribution</td>
<td>0.097</td>
<td>0.166</td>
</tr>
<tr>
<td>B. MDC%: Targeted MDC</td>
<td>0.167</td>
<td>0.286</td>
</tr>
</tbody>
</table>

| C. Ave. Cost per MDC | 3355.86 | 1688.14 | 1175.57 | 24050.29 | 1039.57 | 812.29 | 1878.43 |
| D. # of claims per capita | 0.013 | 0.043 | 0.043 | 0.002 | 0.108 | 0.131 | 0.010 |
| E. Annual cost per capita | 44.11 | 72.83 | 50.72 | 54.32 | 112.57 | 106.18 | 18.46 |
| F. Phys Inact.R.F.Weight | 0.13 | 0.16 | 0.22 | 0.08 | 0.07 | 0.065 | 0.15 |
| G. Risk factor cost | 5.73 | 11.65 | 11.16 | 4.35 | 7.88 | 6.90 | 2.77 | 50.44 |

<table>
<thead>
<tr>
<th>* State</th>
<th>Section II</th>
<th>Cost Per Claimant</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.Carolina</td>
<td>1533</td>
<td>2683</td>
</tr>
<tr>
<td>New York</td>
<td>2699</td>
<td>2179</td>
</tr>
<tr>
<td>California</td>
<td>4075</td>
<td>364</td>
</tr>
<tr>
<td>Texas</td>
<td>11073</td>
<td>2349</td>
</tr>
<tr>
<td>Michigan</td>
<td>1669</td>
<td>961</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>1510</td>
<td>1784</td>
</tr>
<tr>
<td>Washington</td>
<td>932</td>
<td>1497</td>
</tr>
<tr>
<td>H. Average</td>
<td>3355.86</td>
<td>1688.14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>* State</th>
<th>Section III</th>
<th>Per Capita Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.Carolina</td>
<td>0.017</td>
<td>0.088</td>
</tr>
<tr>
<td>New York</td>
<td>0.008</td>
<td>0.172</td>
</tr>
<tr>
<td>California</td>
<td>0.008</td>
<td>0.17</td>
</tr>
<tr>
<td>Texas</td>
<td>0.004</td>
<td>0.127</td>
</tr>
<tr>
<td>Michigan</td>
<td>0.023</td>
<td>0.026</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>0.024</td>
<td>0.023</td>
</tr>
<tr>
<td>Washington</td>
<td>0.008</td>
<td>0.055</td>
</tr>
<tr>
<td>I. Average of 7 states</td>
<td>0.013</td>
<td>0.095</td>
</tr>
</tbody>
</table>
Costs of Physical Inactivity: Bringing it home!

2) Workers’ compensation: Musculoskeletal strains and sprains

3) lost productivity: Presenteeism (2000 hours annually) Absenteeism
**Costs of Physical Inactivity: Bringing it home!**

<table>
<thead>
<tr>
<th>State</th>
<th># of Adults</th>
<th># of Workers</th>
<th>Claims Per Worker</th>
<th>Total # W.C. Claims</th>
<th># of Strain/Sprains</th>
<th>Total $ Paid</th>
<th>Average $ Per Strain/Sprain Claim</th>
<th>PER WORKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>24,500,000</td>
<td>14,300,483</td>
<td>0.018</td>
<td>257,409</td>
<td>118,408</td>
<td>2,632,801,863</td>
<td>22,235</td>
<td>184.11</td>
</tr>
<tr>
<td>North Carolina</td>
<td>6,085,266</td>
<td>3,914,300</td>
<td>0.018</td>
<td>70,457</td>
<td>32,410</td>
<td>663,473,380</td>
<td>20,471</td>
<td>169.50</td>
</tr>
<tr>
<td>New York</td>
<td>13,922,216</td>
<td>8,850,100</td>
<td>0.018</td>
<td>159,302</td>
<td>73,279</td>
<td>1,401,311,026</td>
<td>19,123</td>
<td>158.34</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>4,850,710</td>
<td>2,971,072</td>
<td>0.018</td>
<td>53,479</td>
<td>24,600</td>
<td>311,392,827</td>
<td>12,658</td>
<td>104.81</td>
</tr>
<tr>
<td>Michigan</td>
<td>7,567,350</td>
<td>5,136,130</td>
<td>0.018</td>
<td>92,450</td>
<td>42,527</td>
<td>813,246,812</td>
<td>19,123</td>
<td>158.34</td>
</tr>
<tr>
<td>Texas</td>
<td>15,015,000</td>
<td>9,351,500</td>
<td>0.018</td>
<td>168,327</td>
<td>77,430</td>
<td>1,635,795,053</td>
<td>21,126</td>
<td>174.92</td>
</tr>
<tr>
<td>Washington</td>
<td>6,083,301</td>
<td>3,360,000</td>
<td>0.018</td>
<td>60,480</td>
<td>27,821</td>
<td>290,236,998</td>
<td>19,123</td>
<td>86.38</td>
</tr>
<tr>
<td><strong>7 State Avg</strong></td>
<td><strong>13,003,974</strong></td>
<td><strong>7,980,598</strong></td>
<td><strong>0.018</strong></td>
<td><strong>143,651</strong></td>
<td><strong>66,079</strong></td>
<td><strong>1,291,376,327</strong></td>
<td><strong>22,310</strong></td>
<td><strong>135.72</strong></td>
</tr>
</tbody>
</table>

**Strain/Sprain Per Worker Cost**

<table>
<thead>
<tr>
<th>% of Strain/Sprain</th>
<th>Physical Activity Per Worker National Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.065</td>
<td>8.82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost Unit</th>
<th>Average Hours Lost per Year</th>
<th>Scheduled Workload</th>
<th>Lost Hours as % of Workload</th>
<th>Median Compensation</th>
<th># Workers</th>
<th>Lost Productivity Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absences</td>
<td>18.08</td>
<td>2000</td>
<td>0.00904</td>
<td>36,929</td>
<td>2,000</td>
<td>667676.32</td>
</tr>
<tr>
<td>Presenteeism</td>
<td>140.75</td>
<td>2000</td>
<td>0.070375</td>
<td>36,929</td>
<td>2,000</td>
<td>5197756.75</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5865433.07</td>
</tr>
<tr>
<td>x % phys. inactive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>Total Lost ProdCost</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>2932716.535</td>
</tr>
<tr>
<td>Per Capita Cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1466.36</td>
</tr>
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</table>

**Physical Activity for Everyone**
## Costs of Physical Inactivity: Bringing it home!

<table>
<thead>
<tr>
<th></th>
<th>Indy</th>
<th>Marion</th>
<th>IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>785,597</td>
<td>865,504</td>
<td>6,313,520</td>
</tr>
<tr>
<td>&lt;18 yrs</td>
<td>201,898</td>
<td>232,821</td>
<td>1,578,380</td>
</tr>
<tr>
<td>&gt;65 yrs</td>
<td>22,209</td>
<td>25,377</td>
<td>195,719</td>
</tr>
<tr>
<td>Pot. Work</td>
<td>561,490</td>
<td>607,306</td>
<td>4,539,421</td>
</tr>
<tr>
<td>Actual Work</td>
<td>350,000</td>
<td>400,000</td>
<td>2,000,000</td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>PA</td>
<td>73.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Med Inc</td>
<td>$40,051</td>
<td>$42,702</td>
<td>$43,217</td>
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</table>
### Costs of Physical Inactivity: Bringing it home!

<table>
<thead>
<tr>
<th>Cost</th>
<th>Indy</th>
<th>Marion</th>
<th>IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>$ 982,371,716</td>
<td>$ 1,118,556,472</td>
<td>$ 6,394,581,604</td>
</tr>
<tr>
<td>Per Capita</td>
<td>$ 1,250</td>
<td>$ 1,842</td>
<td>$ 1,013</td>
</tr>
<tr>
<td>Medical Care</td>
<td>$ 175,797,959</td>
<td>$ 135,900,666</td>
<td>$ 1,422,190,033</td>
</tr>
<tr>
<td>Workers Comp</td>
<td>$ 2,077,855</td>
<td>$ 2,374,692</td>
<td>$ 11,873,458</td>
</tr>
<tr>
<td>Lost Productivity</td>
<td>$ 804,495,902</td>
<td>$ 980,281,114</td>
<td>$ 4,960,518,113</td>
</tr>
<tr>
<td>5% increase in PA</td>
<td>$ 49,118,586</td>
<td>$ 55,927,824</td>
<td>$ 319,729,080</td>
</tr>
</tbody>
</table>
• Cardio or aerobic activities. Achieve the aerobic activity recommendation through one of the following options:
  – A minimum of 30 minutes of moderate-intensity physical activity per day (such as brisk walking) most days of the week
  or
  – A minimum of 20 minutes of vigorous-intensity physical activity (such as jogging or running) 3 days a week
• Resistance, strength-building, and weight-bearing activities. Two days a week, incorporate strength training into your routine. Strength training activities, such as weight lifting, maintain and increase muscle strength and endurance. A goal to reach towards is completing 6-8 strength training exercises, with 8–12 repetitions per exercise.
PA Recommendations

• Think of it as the 3-2-1 plan!
• 3 – Complete three activities for 10 consecutive minutes at a moderately intense rate
  OR
  2 – Complete two activities for 15 consecutive minutes at a moderately intense rate
  OR
  1 – Complete one activity for 30 consecutive minutes at a moderately intense rate

Percent change

- Net cost of private health insurance administration
- Family private health insurance premiums
- Personal health care
- Workers earnings

Distribution of 10-Year Impact on Spending from Reducing Obesity

Dollars in billions

Source: Based on estimates by The Lewin Group for The Commonwealth Fund, 2007.
“What is good for the environment is also very good for us.” (Zehng 2008)

**Built Environment Matters!**

- **Compact cities**
  - Sidewalks
  - Bike lanes
- **Public transportation**
- **Public facilities**
  - Parks
- **Incentives (work, insurance, etc.)**
ALTHOUGH THE GENERAL PUBLIC HAS BECOME INCREASINGLY AWARE OF THE PERSONAL HEALTH CONSEQUENCES OF OBESITY, WHAT MAY NOT YET BE GENERALLY APPARENT IS THE PUBLIC HEALTH NATURE OF THE OBESITY EPIDEMIC AND THE CONSEQUENT NEED FOR POPULATION-BASED APPROACHES TO ADDRESS IT (IOM 2005)

SUCCESS “MAY TAKE SEVERAL YEARS OR DECADES AND REQUIRE THE SUSTAINED AND COORDINATED IMPLEMENTATION OF A COMPREHENSIVE AND INTEGRATED SPECTRUM OF STRATEGIES AND ACTIONS TO PRODUCE THE NECESSARY CHANGE IN A VARIETY OF OUTCOMES -- INCLUDING STRUCTURAL, INSTITUTIONAL, SYSTEMIC, ENVIRONMENTAL, BEHAVIORAL, AND HEALTH OUTCOMES. (IOM 2007)
SOURCES AND RESOURCES

Physical Activity for Everyone
• BRFSS, Behavioral Risk Factor Surveillance System http://www.cdc.gov/brfss/
• CDC. Physical Activity Resources for Health Professionals http://www.cdc.gov/nccdphp/dnpa/physical/health_professionals/index.htm
• National Health and Nutrition Examination Survey (NHANES) 1999–2000
• Wolf, A. What is the economic case for treating obesity? Obesity Research. 1998;6(suppl)2S–7S.