Health Benefits of Physical Activity: Implications for Sustainable Communities

California Air Resources Board
California Environmental Protection Agency

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Why look at physical activity and health?

• Physical Activity Guidelines for Americans
• Benefits of sustainable community design
  – Reduced vehicle use
  – Increased mobility
  – Economic growth
  – Conservation of open space
  – Increased physical activity
Built environment designs promote physical activity

• Community designs can improve public health
• Increased physical activity associated with:
  – Green spaces\(^1,2\)
  – Neighborhood walkability\(^3, 4, 5\)
  – Access and use of public transportation\(^6, 7\)

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Health benefits of physical activity

**Children and Adolescents**
- Aerobic Fitness
- Reduced Disease Risk & Symptoms
- Healthy Weight
- Psychological Well-Being

**Adults**
- Aerobic Fitness & Functional Health
- Reduced Death & Disease Rates
- Disease Treatment
- Cognitive Health & Psychological Well-Being
Increased physical activity improves health

- Greatest benefit is from sedentary to active
- Continued benefit seen with higher levels of activity
- Increasing activity reduces premature death: similar reduction to quitting smoking\(^1\)

How can adults achieve their physical activity goal?

150 minutes/week of moderate intensity physical activity
Children and active transport

- Higher fitness Levels\textsuperscript{1,2}
- Better flexibility\textsuperscript{1,2}
- Increased muscular endurance\textsuperscript{1,2}
- Lower overweight risk\textsuperscript{3,4}

\begin{itemize}
  \item \textsuperscript{1}Cooper, A. R., et al. Medicine & Science in Sports & Exercise 2006; 38: 10.
  \item \textsuperscript{2}Cooper, A. R., et al. Preventive Medicine 2008; 74: 3.
  \item \textsuperscript{3}Ostergaard, et al. Journal of Physical Activity and Health 2012; 9: 5.
  \item \textsuperscript{4}Pabayo, R., et al. Preventative Medicine 2010; 50.
\end{itemize}
Associated with decreased:

- Premature death¹
- Strokes and heart attacks²
- Cases of type 2 diabetes³

Air pollution impacts during physical activity

Current Scientific Consensus

• *All populations can benefit from physical activity, but should alter behavior based on air quality*
  
  – Sensitive populations are more impacted by air pollution during physical activity\(^1\),\(^2\)
  
  – Acute and long-term exposure is associated with detrimental cardiovascular and pulmonary effects in healthy and asthmatic children and adults\(^3\),\(^4\),\(^5\),\(^6\)

Air pollution exposure mitigation strategies

- Select less trafficked route\(^1\)
- Avoid walking near the street\(^2\)
- Build green buffers\(^3,4\)
- Observe School AQI Flag Program\(^5\)
- Support Safe Routes to School Program\(^6\)
- Design communities to promote activity

Next steps

• Support community designs that reduce exposure and promote physical activity

• ARB research on mitigation measures
  – Active transport studies
    • Bicycle commuter
    • Walkability
  – Sustainable communities studies
    • Complete streets
    • Transit stops
    • Sound wall and vegetation
    • Light rail

• Distribution of findings
"If exercise could be purchased in a pill, it would be the single most widely prescribed and beneficial medicine in the nation."

—Robert H. Butler