Centers for Disease Control and Prevention
National Environmental Public Health Tracking Network

Heart Health and Air Pollution

A Tool Kit

This toolkit provides messages related to the National Tracking Network. We strongly encourage you to use tool kit components as guides, substituting your own local and regional level messaging and data whenever possible.

Table of Contents

2
Goals and Guiding Principles

6
Environmental Public Health Before and After Tracking: A Decade of Tracking

7
Environmental Public Health Tracking Network: A Timeline

8
Key Messages and Talking Points

10
The Facts

12
Matte Article

13
Social Media Examples

17
Success Stories

www.cdc.gov/ephtracking

Updated on 1-31-2013

Goals and Guiding Principles

In today's world, we are exposed to between 3,500 and 5,000 messages a day. From TV ads to news stories, and tweets to Web sites, there's a fierce competition for our attention—and our response. As public health professionals, you have a uniquely valuable message to communicate, that often pertains to keeping people healthy and saving lives.

Whether communicating with citizens, other public health professionals, or policymakers, the following steps can help your organization cut through the clutter and be heard:

1.

Know your audience

Different audiences require different messages and methods of delivery. Identify your audience, understand what's important to them, and identify what barriers may keep them from action. Then say what you need to say in a way that connects your ideas to that specific audience's needs or wants.

2.

Say it simply

Use plain language, explain technical terms, and be brief. Regardless of profession or background, we all appreciate straightforward, efficient explanations.

3.

Say it often

Advertising studies suggest that a person needs to be exposed to a message three to five times to receive the full effect of the message. Choose the mediums, such as social media, websites, interviews and articles, that your audience uses to communicate, and reinforce your messages often.

4.

Touch the heart

Tell stories that people connect with on an emotional level and underscore that story with data that show the larger perspective. Use personal or local stories to illustrate the big picture.

next page

Goals and Guiding Principles

This tool kit was developed as a resource for your organizaton, with messages that are intended to resonate with either certain demographics or your audiences overall.

This toolkit can be used to help meet the communication goals set by CDC's Environmental Public Health Tracking Network (Tracking Network).

Tracking Network Communication Goals

- Educate about the existence of the Tracking Network and how it can be used to show the connections between health and the environment.
- Demonstrate the effect that Tracking Network findings can have on specific environmental public health issues (for example, heart health and exposure to air pollution).
- Encourage partners, stakeholders, and other organizations to access information from and participate in the Tracking Network and help them recognize it as a valuable tool and good investment.

Audiences

This tool kit was developed as a resource for your organization, with messages that are intended to resonate with either certain demographics or your audiences overall. These audiences include:

- State and local **public and environmental health practitioners:** This group will benefit from general awareness of the Tracking Network and exposure to success stories and specific examples of how data are being used. Encourage them to not only use existing and new Tracking Network services but also advocate use of the program among peer groups.
- **Decision makers**: This group could include city, county, or state health department leadership or elected officials. These are people who might need information for making resource decisions and potential legislative or policy-making opportunities. They are a critical audience for the Tracking Program. Try to provide them with an overall understanding of the functions of the Tracking Network and examples of practical applications of its data. These examples can show how the Tracking Network has proven valuable to cities, states and regions.
- **Interested public:** This group will likely include persons who look to your organization for health or environment-specific information and discover the Tracking Network via that search. They will benefit most from exposure to specific articles and health-specific information that show the connection between a particular health condition and the environment. Because traditional media channels such as television, radio, and newspapers are important information resources for this group, they will benefit from your organization's active engagement with, and response to, media coverage that relates to health and the environment.

next page

Goals and Guiding Principles

How to Use Tool Kit Components

Decade of Tracking This piece is a straightforward story of the Tracking Network. It uses the simple structure of "Before and After Tracking" to explain the effect the Tracking Network has had.

Ideas for use: *Use this item as an introductory piece that tells the story of tracking. Include it as a link, borrow from it when developing presentations, and use it when informing colleagues about available resources, interviews, and materials.*

Timeline: This piece serves as a visual demonstration of how the Tracking Network (and its parent, the Tracking Program) began and has evolved.

Ideas for use: *Use when creating briefings, as background for presentations, and as a resource for interviews and material development.*

Key Messages and Talking Points: The key messages and talking points have been written to support you and your spokespeople as you address the critical role the Tracking Network has played in addressing environmental and public health issues. These messages may be used as is or can be customized and incorporated into your own messaging. We encourage you to use local-,regional-,or state-specific data whenever possible; using these data will further underscore the importance of this resource for your constituents.

Ideas for use include: *Incorporate these messages into talking points for presentations, speeches, media interviews and copy for materials.*

The Facts: This fact sheet was developed to provide you with health- and environment-specific information that can be used to coincide with awareness events and more. For example, the Heart Health and the Air Pollution fact sheet contains information that relates specifically to American Heart Month as well as general statistics about heart health and air pollution.

Ideas for use: *Incorporate these facts into your outreach via speeches, emails, Web site content, material development, and social media channels. Provide the fact sheet as a resource to news media. Include interesting data as part of your organization e-mail signature during awareness events. Also, provide the fact sheet to your partners as a resource to distribute.*

next page

Goals and Guiding Principles

Matte Article: This article has been developed as a stand-alone piece that highlights the connection between a health topic and the environment. Its messaging reach is designed to be broad and valuable for everyone from general consumers looking for information about a particular disease to health professionals who want to raise awareness among patients.

Ideas for use: *Submit this piece to community papers, provide it to organizations to publish in their newsletters, post it on your Web site, include a link to it on your Facebook wall, and share it via tweets. Distribute or make it available electronically to local schools, medical centers, nursing homes, and health care professionals. Provide this piece to decision makers and use local data when possible – it will inform them about the environment-health connection and how that can affect their constituents; they can also use it on their Web sites. You can also include it in newsletters and incorporate into your organization's mailings.*

Social Media Examples: This document contains example topics and sample copy for use on social media channels such as Facebook and Twitter. These posts/tweets were written with the goal of helping your organization engage in a dialogue with your many and varied audiences. Specific examples are provided that can be used to help communicate the value of the Tracking Network to health departments, health practitioners, decision makers and other interested organizations and individual persons.

Ideas for use: *Use posts on Facebook and tweets on Twitter. Share with partners who have social media outlets.*

Effective Communication: A Crucial Investment

As grantees and partners of the National Environmental Public Health Tracking Network, your organization is an important voice that helps communicate the value of the Tracking Network, and ensures that it can grow and evolve to provide even better service into the future. By incorporating this message at every opportunity into your documents, policy briefings, community outreach, social networks, and media outreach, you serve as an influential resource that can provide critical information and translate the value of the Tracking Network to your different audiences. Together, we can educate people about the connection between health and the environment, encourage Tracking Network use, and help potential partners and champions recognize this tool as a crucial investment that saves lives, protects people and saves money through prevention. ■

Environmental Public Health Before and After Tracking:

A Decade of Tracking

"When the Pew Commission report came out, everyone — the press, the public, Congress — couldn't believe that a tracking program didn't already exist."

Shelly Hearne, Dr. P.H.
Founding Executive Director,
Trust for America's Health (2000)

"CDC's National Environmental Public Health Tracking Network is the most important accomplishment of the past decade."

Thomas A. Burke, Ph.D., M.P.H.
Associate Dean for Public Health Practice and Training
Professor, Department of Health Policy and Management
Johns Hopkins Bloomberg School of Public Health (2010)

CDC's National Environmental Public Health Tracking
A Decade of Tracking
2002 - 2012

After a decade of tracking via a national environmental public health tracking program, our understanding of the connections between public health and the environment is vastly improved. CDC's Environmental Public Health Tracking Program began 10 years ago with the idea that health and environmental problems are not always separate issues with unrelated solutions. Though the program began in 2002, the actual online Environmental Public Health Tracking Network launched in 2009. This website is a valuable tool that is helping draw a clear picture of the intricate relationships between environment and health. And, as we move forward, the Tracking Network has the potential to empower more and more organizations to save lives and protect health.

Before tracking, even simple questions about health and the environment could take months to answer.

With a tracking network in place, public health officials can respond quickly, often within hours, to locate hazard sources or answer citizens' concerns.

Before tracking, collections of data were created and held by many different government departments within their separate department "silos."

With tracking, standards and tools to link these disparate sources of information now exist and can help answer important questions about the public's health.

Before tracking, environmental and health fields were often separated both physically and philosophically.

With tracking, these two worlds are brought together to benefit of all.

Before tracking, public health and environmental officials concentrated mainly on acute events such as hazardous chemical releases or point-source pollution, such as air pollution from a specific factory.

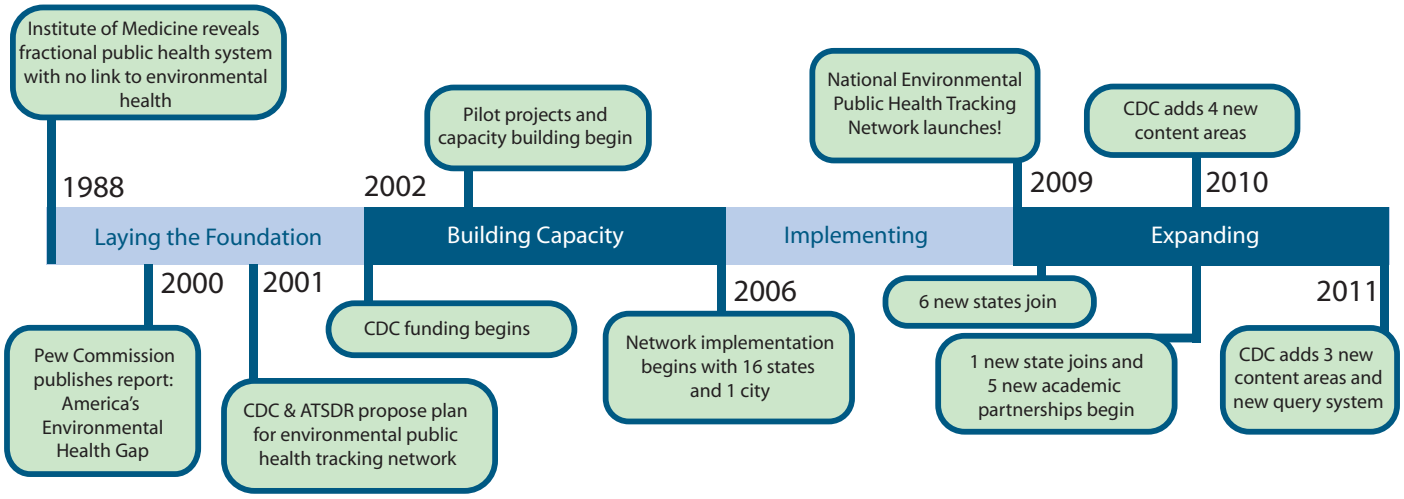
With tracking in place, officials can trace amounts and geographic spread of pollutants over time. This capability allows the officials to monitor long-term trends and place those acute events in context.

Before tracking, environmental health surveillance was more difficult than infectious disease surveillance, a traditional area of concern for CDC and state and local health departments.

With tracking, we can apply the same "disease detective" skills to finding environmental causes of illnesses and then take preventive measures to protect the public's health. ■

Environmental Public Health Tracking Network:

A Timeline



Key Messages and Talking Points

The following key messages and talking points can help you and your spokespeople convey and emphasize the effect the Tracking Network can have.

How to Use

The following key messages and talking points can help you and your spokespeople convey and emphasize the effect the Tracking Network can have on addressing the connections between air pollution and heart disease. These messages may be used as they have been written or they can be customized for your own purposes. We encourage you to use local-, regional-, or state-specific data whenever possible because it will further underscore the importance of this resource for your constituents. Each of the three key messages presented are supported by three to four additional talking points.

Key Messages

- The National Environmental Public Health Tracking Network is a one-of-a-kind tool that brings together information that cannot be found, or is hard to find, anywhere else.
  - The Tracking Network is the best Internet resource connecting environmental and health information.
  - The Tracking Network is unique because it brings together and standardizes data that would be usually be kept by many different agencies, allowing us to see how our health and the environment are related.
  - The Tracking Network helps make sense of these data with tools such as maps that show where environmental and health problems are happening. This makes that valuable information more useful to people who need it, from scientists to decision-makers.
  - Policy makers, educators, and public health workers can protect people and save lives by using The Tracking Network to help make critical decisions about where to target environmental public health resources.
- The Tracking Network is helping us understand better how the environment is connected to heart health.
  - Studies have shown that people who breathe very small bits of air pollution (fine particle pollution) over a long time have more heart problems, such as heart attacks, than people who are not breathing this kind of air pollution.
  - The information about fine particle pollution helps us know the effect our protective actions could have. For example, reducing fine particle pollution by 10% could likely prevent more than 13,000 deaths every year across the nation.
  - (INSERT ORGANIZATION) was able to put (INSERT ACTION, SAFEGAURD, ETC.) in place to help reducing fine particle pollution, which will save (INSERT LOCAL/STATE NUMBERS) lives in (INSERT CITY/STATE).

next page

Key Messages and Talking Points

- The Tracking Network boosts (INSERT ORGANIZATION) ability to save lives and protect the health of the people we serve.
  - The Tracking Network fills information gaps.
  - The Tracking Network helps us respond quickly to environmental public health issues.
  - Please help others use this important and valuable resource. Everyone who is looking for information about a health and environmental connection should and can use the Tracking Network at www.cdc.gov/ephtracking. ■

Heart Health and Air Pollution

The Facts

About every 25 seconds, an American will have a heart-related event such as a heart attack.

Heart disease is the leading cause of death in the United States and a major cause of disability. We have long known that things like lack of exercise and poor diet can increase the risk of heart disease. We are discovering that how good or bad the air we breathe is affects heart health also. We now know that people who breathe very small bits of air pollution (fine particle pollution) either short term or long term have a greater risk of heart disease than people who do not breathe this kind of air pollution. The National Environmental Public Health Tracking Network (Tracking Network) is helping us understand how the environment and heart health in America are connected. The Tracking Network is a tool that can help us estimate how solving one problem can help solve the other. For example, according to studies and the estimates available on the Tracking Network, reducing fine particle pollution by 10% could prevent more than 13,000 deaths every year across the nation.

Heart Health in America

- The term "heart disease" refers to several types of heart conditions that affect either how the heart muscle is made or how it works. These conditions include abnormal heartbeat (called cardiac arrhythmias), congestive heart failure, and stroke.[1]
- Heart disease is the leading cause of death for both men and women in the United States; heart disease caused half of the deaths in 2006 among women.[2]
- About every 25 seconds, an American will have a heart-related event such as a heart attack, and about once every minute, an American will die from one.
- In the United States, the most common type of heart disease is coronary artery disease, which can cause a heart attack. In 2010, about 785,000 Americans had a first heart attack, and about 470,000 Americans had a heart attack that was not their first one.[3]
- In 2010, heart disease cost the United States $316.4 billion. This total includes the cost of health care services, medications, and loss of normal activities.[4]

The Connection between Heart Health and Air Pollution

- Fine particle pollution, sometimes referred to as fine particulate matter or PM2.5, is a type of air pollution made up of tiny particles in the air that are small enough to be breathed deeply into the lungs, where they can affect the heart and more.[5] This type of pollution is caused mostly by burning fossil fuels (like coal, oil, or natural gas), and can cause the air to look hazy.
- Exposure to fine particle pollution contributes to cardiovascular disease and death, according to the 2004 American Heart Association's Scientific Statement on Air Pollution and Cardiovascular Disease.
- People who breathe fine particle pollution over a long time have more heart problems, like heart attacks, than people who do not breathe this kind of air pollution.

1 http://www.cdc.gov/heartdisease/about.htm
2 http://www.cdc.gov/heartdisease/facts.htm
3 http://www.cdc.gov/features/heartmonth/
4 http://www.cdc.gov/heartdisease/facts.htm
5 http://www.health.ny.gov/environmental/indoors/air/pmq_a.htm

next page

The Facts

- Short-term exposures (only hours or days) to fine particle pollution can increase the risk for heart attack, stroke, heart failure, and irregular heartbeat in some people. Older people and people who have coronary artery disease or structural heart problems that they do not know about are also at increased risk for greater heart problems.
- The risk for cardiovascular disease and death is increased by short-term (only hours or days) and long-term exposure to fine particle pollution.
  - Breathing higher amounts of fine particle pollution even for a short time can increase the risk for cardiovascular death. In the United States each year, thousands of people die earlier than normal because they have breathed higher amounts of fine particle pollution for a short time.
  - The World Health Organization has estimated that each year, more than 800,000 deaths are caused by breathing fine particle pollution long term. This pollution ranks thirteenth as a cause of death throughout the world.[6]

What We Are Learning from the Environmental Public Health Tracking Network

- The Tracking Network uses information from many health resources to help understand how air pollution and heart health are connected. It combines data about fine particle pollution, deaths, and population information from public health resources with information from scientific resources that shows how changes in air pollution affect health.
- The Tracking Network can then tell us roughly the number of deaths that could be prevented in a county, state, or the nation if fine particle pollution is reduced. Studies suggest that the number of deaths due to heart disease can be lowered if fine particle pollution is reduced even slightly. For example, according to published studies and using 2006 Tracking Network data, reducing fine particle pollution by 10% could prevent:
  - more than 400 deaths per year in a highly populated county like Los Angeles County,
  - more than about 1,400 deaths every year in California; and
  - more than 13,000 deaths every year across the nation.
- You can take the following steps to protect your heart from air pollution.
  - Know what your risk for cardiovascular disease is and how sensitive you are to air pollution.
  - Know when air pollution may be high in your area and reduce your exposure. Use the Air Quality Index to get accurate information.
  - Plan activities when and where pollution levels are lower.
  - Listen to your body.
  - See your health care provider when you need to.
  - Keep your medication with you.[7] ■

6 http://my.americanheart.org/idc/groups ahamah-public/@wcm/@sop/ documents/downloadable/ucm_319618.pdf
7 http://ephtracking.cdc.gov/showHeart Prevention.action

Matte Article

People who breathe very small bits of air pollution (fine particle pollution) either short term or long term have a greater risk of heart disease.

Breathe Easier and Help Your Heart: Six Steps to Protect Your Heart from Air Pollution

Heart disease is the number one cause of death in the United States (U.S.) and a major cause of disability. About one of every four deaths in the U.S. is caused by heart disease. We have long known that things like lack of exercise and poor diet can increase the risk of heart disease. We are discovering that how good or bad the air we breathe is affects heart heath also.

People who breathe very small bits of air pollution (fine particle pollution) either short term or long term have a greater risk of heart disease than people who do not breathe this kind of air pollution. Fine particle pollution, also known as particulate matter 2.5 (PM2.5), is made by burning fossil fuels. It is dangerous because it is made up of tiny particles that are small enough to be inhaled deeply into your lungs, where they can affect the heart, lungs, and blood vessels.

A tool from the Centers for Disease Control and Prevention is helping us understand this connection between heart health and the air we breathe. The National Environmental Public Health Tracking Network (Tracking Network) is a tool that can help us estimate how solving one problem can help solve the other. For example, according studies and estimates available on the Tracking Network, reducing fine particle pollution by 10% could prevent more than 13,000 deaths every year across the nation.

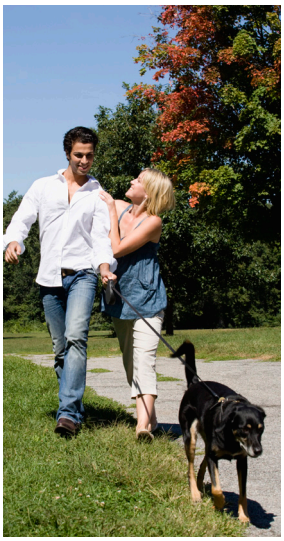
The Tracking Network makes it easy to see information and recognize factors about certain community qualities that may cause a higher risk of heart problems related to air pollution. These factors include issues like a high rate of poverty, more people without insurance, higher exposure to auto exhaust due to more people living in the community, and more. These risk factors are associated with more heart and lung problems, hospital visits, and deaths in areas with high amounts of air pollution.

This information can be used to help public health officials give these communities the help they most need, such as policies that keep the air clean. In addition, there are six easy tips you can use to help protect your heart from the effects of air pollution:

1. Know what your risk for cardiovascular disease is and how sensitive you are to air pollution.
2. Know when air pollution may be high in your area and reduce your exposure. Use the Air Quality Index to get accurate information.
3. Plan activities when and where pollution levels are lower.
4. Listen to your body.
5. See your health care provider when you need to.
6. Keep your medication with you.

Learn more about the Environmental Public Health Tracking at www.cdc.gov/ephtracking, heart disease at http://millionhearts.hhs.gov/about_hd.html and air pollution at http://www.cdc.gov/nceh/airpollution/. ■

Social Media Examples



These posts/tweets were written to help your organization "talk" with your many audiences.

This document contains example topics for social media channels such as Facebook and Twitter. These posts/tweets were written to help your organization "talk" with your many audiences. Specific examples are provided that can be used to help communicate the value of the Tracking Network to health departments, decision makers and other interested parties. Each post/tweet is organized under a goal of the Tracking Network: each is written so that it may be used as is or customized by your organization with language and data that will best resonate with your constituents.

Tips for Using Social Media:

- Social media channels are powerful tools that can help you communicate with and engage your audience. If you do not already have social media tools in place, set up a Facebook page and Twitter account here:
  - www.facebook.com
  - twitter.com/signup
- CDC's Tracking Network has an active Facebook page and Twitter account. "Friends" can follow us and share relevant and interesting posts.
  - Facebook: like CDC National Environmental Public Health Tracking Network
  - Twitter: follow @CDC_EPHTracking
- Watch for general news articles about public health and the environment and share these articles on your Facebook wall and Twitter account.
- Use the provided tool kit materials, such as the fact sheet and key messages, to create new posts and tweets that underscore how effective the Tracking Network is and has been.
- Tips for Facebook:
  - When mentioning the Tracking Network, use @CDC National Environmental Public Health Tracking Network
- Tips for Twitter:
  - Hashtags make your tweets searchable and allow them to become part of the broader conversation on a given topic. When posting heart month-related material, use #heartmonth; when posting general heart-health material, use #hearthealth. When mentioning the Tracking Network, use #CDCEPHT.

next page

Social Media Examples

- Help build the Tracking Network's Twitter following by including @CDC_EPHTracking in your #FF (Follow Friday) tweets. Follow Friday (#FF) is a hashtag used to recommend relevant Twitter users to your existing followers. It helps people find new and interesting Twitter users through their friends' recommendations. Here's an example of what a Follow Friday tweet looks like:

  #FF #Medical #Health @DMC_Heals @HenryFordNews @ClevelandClinic @KHNews @ kevinmd @DoctorsLounge @GoHealthDotCom @DrDavidHanscom @meyouhealth

Sample Posts/Tweets for Social Media

Goal: Educate about the connection between heart health and the environment via American Heart Month

Facebook	Twitter
February is American Heart Month. CDC's Tracking Network equips public health officials to battle heart disease in our communities: www.cdc.gov/ephtracking	Feb is #heartmonth. The @CDC_ EPHTracking Network equips pub health officials to battle the disease in our communities http://bit.ly/eZiMpa
Studies have shown that people exposed to fine particle air pollution over a long period of time have more heart problems, such as heart attack: http://ephtracking.cdc.gov/showAirHIA.action	@CDC_EPHTracking Network data have shown long-term fine particle air pollution exposure = more #hearthealth probs http://bit.ly/cEo92r
Studies and Tracking Network data estimate that reducing fine particle pollution by 10% could prevent more than 13,000 deaths across the nation. Check out this link to find out how many lives could be saved in your county! www.cdc.gov/ephtracking	@CDC_EPHTracking Network data: Reducing fine particle pollution by 10% could prevent 13k+ deaths nationwide http://bit.ly/eZiMpa
Studies have shown that exposure to air pollution can increase the risk of heart disease. Check the air quality index to find out if the air near you is healthy: http://www.airnow.gov	Exposure to #airpollution can increase risk of heart disease. Check the air qual index & find out if your air is healthy http://bit.ly/g51o

next page

Social Media Examples

Goal: Raise awareness about the connection between public health and the environment via Tracking Network

Facebook	Twitter
Did you know there's a connection between heart health and air pollution? Check out other connections between health and the environment in your area: www.cdc.gov/ephtracking	Did you know #hearthealth & #airpollution are connected? Check out other health/enviro info near you http://bit.ly/eZiMpa
Our health and the environment connection is complex. Want to learn what environmental health issues are of most concern in your area? Use CDC's Tracking Network to find out: www.cdc.gov/ephtracking	Health & environment connetion is complex. Use the @CDC_ EPHTracking Network to learn about issues near you http://bit.ly/eZiMpa
Tracking Network data and other studies indicate that reducing find particle pollution by 10% could prevent more than 13,000 deaths across the nation. Check out CDC's Tracking Network to learn more: www.cdc.gov/ephtracking	Reducing #airpollution in your area could save lives. Check out the estimates on CDC's Tracking Network http://bit.ly/eZiMpa
Poll: CDC's Tracking Network is helping us better understand the relationship between environment and health. What environmental health problems are you concerned with right now? • How air pollution affects heart health: • How lead poisoning can affect children: or • How carbon monoxide poisoning affects the	What #environmental #health problems are you concerned with right now? http://bit.ly/eZiMpa

next page

Social Media Examples

Goal: Demonstrate the Tracking Network's value as a resource and attract people to the Website

Facebook	Twitter
You work to protect people and save lives. Use the Tracking Network to access environmental health data that help you do just that! www.cdc.gov/ephtracking	#Health & #enviro data can protect people and save lives! Check out @ CDC_EPHTracking Network http://bit.ly/eZiMpa
(INSERT YOUR ORGANIZATION NAME) is using the CDC's Tracking Network to understand how public health and the environment are connected. What environmental health issues most concern you? www.cdc.gov/ephtracking	We're using the @CDC_EPHTracking Network to understand how #PublicHealth & the #environment are connected http://bit.ly/eZiMpa
Public health professionals: Access CDC's Tracking Network to find relevant environmental health information that can help you makes critical decisions about targeting resources most effectively. www.cdc.gov/ephtracking	#PublicHealth professionals, use the @ CDC_EPHTracking Network data on #enviro health to help make resource decisions http://bit.ly/eZiMpa

Success Stories

The story provided here highlights how the Tracking Network has been used to improve public health. You can share this story as examples of how the Tracking Network has been used for asthma and outdoor air pollution issues, as an example of how the network could be used to benefit your community, or as a model for your own success story using network data. You can find more success stories on the Tracking Network in the Asthma and Outdoor Air sections.

Take a look at how Maryland used its tracking network to track asthma hospitalizations and inform further public health research.

In 2007, an estimated 550,000 (12.9%) Maryland adults and 190,000 (13.6%) children reported a lifetime history of asthma. In addition, about 43,000 Maryland residents were treated for asthma in emergency departments, and nearly 9,800 persons were hospitalized for asthma. Fine particulate matter, also known as PM2.5, which comes from vehicles, power plants and wildfires as well as other sources, can go deep in the lungs of adults and children, and can contribute to asthma attacks and more asthma emergency department visits and hospital stays.

The Maryland Tracking Program used asthma emergency room visit and hospital discharge data from the health department and air data from the MDE and the Environmental Protection Agency (EPA) to carry out an EPA- funded project, to examine the relationship between asthma rates and fine particulate levels in and around Baltimore.

This data linkage project, which used 2005-2006 data, found that asthma emergency department visits and inpatient hospital stays went up on days when on-the-ground air monitors recorded more PM2.5 in the air. Local public health officials from Baltimore and nearby communities can use these results to determine if local policies that regulate PM2.5 sources should be re-evaluated and perhaps modified.