

New York State Prevention Agenda

Promote a Healthy and Safe Environment Action Plan

Introduction

The 2013-2017 State Health Improvement Plan to “Promote a Healthy and Safe Environment” in New York State focuses on four core areas that impact health. These are: the quality of the *water* we drink, the *air* we breathe, and the built *environments* where we live, work, learn and play; and injuries and occupational health. ‘Environment,’ as used here, incorporates all dimensions of the physical environment that impact health and safety. In addition to addressing the six cross-cutting issues identified by *ad hoc* Committee (access to quality health services and early identification of health problems; life course perspective; health disparities; social determinants of health; a gender perspective; and oral health), the healthy and safe environment committee proposed the impact of and adaptation to climate change as another cross-cutting issue within this action plan.

The Plan was developed by the ‘Promote a Healthy and Safe Environment’ Committee, whose members represent a diverse group of environmental, occupational health, and violence and injury prevention experts from local, State and Federal government agencies; business; labor; community-based organizations; and academic and research organizations. The Committee acknowledged several complexities and challenges in developing this Plan:

- First, the impact of the physical environment on health is multi-faceted. While the causes of some environmentally related health problems are well established (e.g., neurological damage due to lead poisoning, asphyxiation due to carbon monoxide poisoning), others are indirect, multi-factorial, chronic, and not routinely tracked (e.g., long-term impacts of various forms of energy usage on climate change and health in New York State). This Plan incorporates issues at both ends of the spectrum. In some cases, interventions are well established; in other cases, the Plan involves establishing surveillance systems to track and better document progress and health impacts.
- Second, environmental conditions can have immediate, short-term and long-term impacts on health. The direct health benefits of some of the interventions proposed here are expected to be measurable within the five-year timeframe of this plan. Others may not have measurable impacts on health for many years to come, although we believe we will be able to track changes in environmental conditions and exposures in the interim.
- Third, some environmental conditions vary markedly between regions, communities and populations across the State (e.g., urban vs. rural, upstate vs. downstate, children, elderly, and the poor). Accordingly, not all interventions are appropriate for all communities. The Committee has attempted to establish a framework and a range of proposed interventions that individual communities can tailor to their own needs.
- Fourth, progress will require a multi-sector approach, involving diverse public and private partners across housing, transportation, energy, insurance, health care and other sectors. The Committee was fortunate to have representation by some but not all stakeholders. The success of this Plan in meeting its proposed goals and objectives lies in the ability to mobilize stakeholders to work together.

We are greatly indebted to DOH staff and to the members of the ‘Promote a Healthy and Safe Environment Committee’ for their time and expertise.

New York State Prevention Agenda
Promote a Healthy and Safe Environment Action Plan
Focus Area 1: Outdoor Air Quality

Defining the Problem

Poor outdoor air quality leads to increases in illness and death. People with underlying respiratory disease, including asthma or cardiovascular disease, are particularly at risk due to poor air quality. One in 11 New Yorkers (1.3 million adults and 475,000 children) were estimated to have asthma in 2008; asthma-related hospitalization rates in New York are higher than national rates for all age groups. Studies in New York have found that asthma death rates and hospitalization rates are higher among low-income and minority residents than White, higher-income residents.^{1,2}

Cardiovascular disease is the leading cause of death nationally and in New York, with almost 59,000 New Yorkers dying of related illnesses in 2008.³ The total cost for cardiovascular disease in New York was estimated to be \$32.6 billion in 2008, based on extrapolation from national data.⁴ Mortality rates from heart diseases have been declining nationally and in New York, but are still higher in New York than in the United States as a whole.⁵ Mortality and hospitalization rates due to heart diseases are highest in Black non-Hispanics among all racial and ethnic groups in New York.⁶

Extensive evidence shows that both ozone and fine particulate matter (particles that are less than 2.5 microns in diameter) exposures are associated with increased respiratory and cardiovascular illnesses and deaths. Some evidence also shows that ongoing long-term exposure to these pollutants is also associated with the increasing rates of asthma development.⁷

The United States Environmental Protection Agency (USEPA) regulates certain outdoor air pollutants under the Federal Clean Air Act. USEPA has designated six air pollutants, i.e., carbon monoxide, lead, nitrogen oxides, ozone, fine particulate matter and sulfur dioxide as criteria pollutants, and established health-based air concentration standards for them, known as the National Ambient Air Quality Standards (NAAQS). Due to the efforts of the federal government and the State agencies that control air releases through regulations and permitting, the air quality in New York has greatly improved over the last 40 years. However, with the adoption of the more stringent 2008 ozone NAAQS and the current NAAQS for fine particulate matter, 11 counties⁸ are currently designated as non-attainment for ozone, fine particulate matter or both pollutants.

The New York State Department of Environmental Conservation (NYSDEC) develops regulations to control releases of air pollutants and implements Federal regulations that seek to reduce ambient air pollution. NYSDEC also is charged with developing State Implementation Plans (SIP) to set out control strategies to reduce criteria air pollutant concentrations in areas exceeding the NAAQS. A SIP evaluates the current air quality status and projects through model forecasts the effect of control measures needed to reach attainment. Because the SIP is a regional plan and includes specific sources, it may not address potential local-scale impacts from sources, such as residential (i.e., outdoor wood boilers installed prior to 2011) or small commercial or institutional biomass burning boilers.⁹ Another example of a small source not evaluated in the SIP is fast-food char broilers.¹⁰ Additionally, the SIP addresses precursors for ozone formation, but does not evaluate specific releases of toxic air pollutants that individually may be of health concern.

Toxic air pollutants, also known as hazardous air pollutants, are those pollutants known or suspected to cause cancer or other serious health effects, such as reproductive effects, birth defects, or adverse environmental effects. Examples of toxic air pollutants include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Examples of other listed air toxics include dioxin, asbestos, toluene, and metals, such as cadmium, mercury, chromium, and lead compounds. People exposed to toxic air pollutants at sufficient concentrations and durations may have an increased chance of developing cancer or experiencing other serious health effects. These health effects can include damage to the immune system, as well as neurological, reproductive (e.g., reduced fertility), developmental, respiratory and other health problems. In addition to exposure from breathing air toxics, some toxic air pollutants, such as mercury can deposit onto soils or surface waters, where they are taken up by plants and ingested by animals and are eventually magnified up through the food chain. Like humans, animals may experience health problems if exposed to sufficient quantities of air toxics over time. Although the air quality concentrations in New York for many of the toxic air pollutants has significantly improved in recent decades, for some of the air toxics, the general ambient air concentration is still above levels of concern.

Human activities also have increased the amounts of carbon dioxide (CO₂) and other heat-trapping gases, collectively called greenhouse gases (GHGs), in the atmosphere. Current scientific evidence suggests that a warming climate poses a serious threat to New York's environmental resources and public health. Climate change affects air quality, water quality, fisheries, drinking water supplies, wetlands, forests, wildlife and agriculture.¹¹ The largest contributor of GHGs is combustion of fossil fuels, such as coal, oil and natural gas used to produce energy and for transportation. Industries such as petroleum and chemical manufacturing also release GHGs and other hazardous pollutants. GHGs trap heat, thereby contributing to regional climate changes which include warmer average temperatures and more frequent and longer heat waves that increase in the frequency and/or severity of extreme weather events, and increase the risk for dangerous flooding, high winds, and other direct threats to people. These climate changes will likely cause region-wide increases in a variety of health outcomes, such as heat-related illnesses and deaths, food and water-borne diseases, certain vector-borne diseases, and injuries associated with extreme weather events. Climate also has significant influence on air quality. For example, warmer temperatures are expected to accelerate chemical reactions in the atmosphere that lead to ozone and fine particle formation.

Executive Order No. 24 (2009) established the goal of reducing GHG emissions from all sources in New York State to 80 percent below levels emitted in 1990 by the year 2050. New York State is building a portfolio of programs and policies aimed at reducing GHG emissions. State programs use emission controls, technical assistance and financial incentives to ease the transition of electric power generation, buildings, transportation and industrial processes away from fossil fuel combustion and towards clean energy. The health benefits of GHG reduction policies include the following: cleaner air (less ozone formation; fewer pollutants released), the encouragement of land-use planning that reduces private car use and encourages more walking and cycling, and safer transportation through community design that accommodates alternative transportation.

Research also shows that policies intended to reduce GHG emissions will have more health benefits if accompanied by complementary policies that target emissions of harmful co-pollutants from sources. These pollutants are directly harmful to humans and directly impact the health of communities where sources (e.g.,

industrial facilities, transportation sources) are located.¹² Coordination of efforts to reduce GHGs and other harmful air pollutants, especially in low-income and minority communities, can provide an efficient and equitable approach to realize the health benefits anticipated with reductions in both GHGs and other air pollutants.

Goals and Objectives for Action

The Air Quality Focus Area Committee identified the following goals and objectives for action as well as sector level interventions to implement the identified goals and objectives:

Goal #1: Reduce exposure to outdoor air pollutants with a particular focus on burdened communities.

Objective 1a: Reduce the annual number of days with unhealthy air as measured by the Air Quality Index (AQI)>100 to 0. (Baseline: New York City annual average days 5 for ozone and 6 for PM; Rest of State annual average days 5 for ozone and 3 for PM (2005 – 2009 DEC monitoring data compared to current NAAQS)*)

Objective 1b: Implement policies that target vulnerable groups to reduce exposure to short-term increases in pollutant levels (e.g., policies for schools, day cares, children’s camps, assisted-living facilities that reduce or reschedule outdoor activities during air quality advisories).

Objective 1c: Reduce releases of pollutants from stationary sources (e.g., large industrial facilities and small sources, such as gas stations, dry cleaners, outdoor wood boilers, fast food char-broilers) and from mobile sources (e.g., cars, trucks, and lawn, farming and construction equipment) that may contribute significantly to local air pollutant levels.

Objective 1d: Coordinate efforts to reduce emissions of harmful co-pollutants with efforts to reduce GHG or carbon emissions.

**Objectives that are bolded are a Tracking Indicator.*

Goal #1: Reduce exposure to outdoor air pollutants with a particular focus on burdened communities.

Levels of Health Impact Pyramid ^a	Interventions ^b
Counseling and Education	<ul style="list-style-type: none"> • Provide guidance to the public on potential health effects of criteria air pollutants and actions individuals can take to reduce exposures when levels are forecast to exceed NAAQS. Explore the use of electronic and social media, and partner with meteorologists and local health departments to raise awareness. • Develop a media campaign to provide information on public health effects of air pollutants and their sources. • Consider implementing EPA’s Air Quality Flag program at schools and other community organizations.
Clinical Interventions	<ul style="list-style-type: none"> • Enhance primary care utilization for management of chronic conditions such as asthma or cardiovascular disease aimed toward better prevention of acute symptoms.
Long-Lasting Protective Interventions	<ul style="list-style-type: none"> • Assess and reduce emissions from categories of stationary and mobile pollutant sources that may contribute significantly to local air pollutant levels. Possible areas of focus could include residential wood boilers and residential boilers using higher sulfur heating fuels (such as #4 and #6). • Revise NYS building codes to reduce effects of residential biomass burning appliances. • Coordinate activities addressing climate change mitigation through reduction of GHG emissions with regulatory activities intended to reduce emissions of other harmful co-pollutants in communities meeting the definition of environmental justice areas. • Urge all agencies to consider toxic and GHG emissions in SEQRA reviews. • Focus emission reductions efforts at facilities and business sectors with higher harmful co-pollutant emissions.
Changing the Context to Make Individuals’ Decisions Healthy	<ul style="list-style-type: none"> • Develop State Implementation Plans (SIPs) that rely on and credit, in part, multiple interventions that support the transition to cleaner burning fuels and clean energy sources, including renewable power and energy efficiency, in the transportation, buildings and electricity sectors to achieve sustained reductions in air pollution levels over time. • Support transportation options that reduce air pollution from mobile sources (e.g., support public transportation, community planning incorporating enhanced walkability or cycling, pricing strategies, greater diversification of transportation fuels). • Establish policies that promote or require planning that takes into account existing concentrations ambient air pollutants and alters client activities appropriately. • Support installation of catalytic converters on chain-driven char-broiler exhaust ventilation in quick-serve restaurants. • Support efforts to reduce the use of higher sulfur heating fuels (#4 and #6).
Socioeconomic Factors	<ul style="list-style-type: none"> • Incorporate information on vulnerability to climate change in identification of Environmental Justice communities for targeting climate adaptation measures.

^aFrieden T. “A Framework for Public Health Action: The Health Impact Pyramid”. *American Journal of Public Health*. 2010; 100(4): 590-595

^bInterventions in boldface type have been proposed for prioritization

Interventions by Sector

Change can be made across the sectors identified below to improve health outcomes related to air quality. Below are examples of how your sector can make a difference.

Healthcare Delivery System

- Educate susceptible patients on risks from increased outdoor air pollutant levels and sources of information to obtain air pollution forecasts for criteria pollutants. *(Objective 1a, 1b)*
- Promote access to and availability of the primary care system for the public to use to manage chronic conditions, such as asthma or CVD aimed toward better prevention of acute symptoms. *(Objective 1b)*

Employers, Businesses, and Unions

- Conform to requirements of Federal and State regulations submitted as a component of New York State Implementation Plans that control emissions and reduce releases of air pollutants. *(Objective 1c)*
- Provide policies and guidance on outdoor work practices to reduce exposures to air pollutants. *(Objective 1b)*
- Support decisions/policies to reduce/control emissions of GHGs as well as harmful co-pollutants, especially in environmental justice communities. *(Objective 1d)*
- Incentivize the use of public transportation through tax deductible flexible spending accounts, union rates, etc. *(Objective 1b, 1d)*

Media

- Convey general awareness messaging regarding health concerns and actions to reduce exposure and reduce contributions to pollutant emissions (e.g., commuting-related). *(Objective 1b)*
- Provide an outlet for daily air quality advisory messages; also heat advisory messaging and pollen levels. An evidence-based media campaign (e.g., similar to those developed for the tobacco control program) could inform public regarding health effects of exposure to air pollutants (e.g., local PM sources). *(Objective 1b)*
- Dedicate space and time to local activities focused on efforts to reduce air toxic releases in their area (e.g., to encourage carpooling/use of public transportation). *(Objective 1a, 1b, 1c)*

Academia

- Engage communities to gather information and develop policies to address toxic air emissions. *(Objectives 1b, 1d)*
- Help communities translate basic research results into development of policies that will maximize the health benefits of reducing both GHG and co-pollutants. *(Objectives 1b, 1d)*

Other Governmental Agencies

- Continue the State's air quality monitoring network. Identify policies that help reduce local sources of criteria pollutants. (DEC, *Objective 1a*)
- Support transportation-related elements of State Implementation Plans (e.g., provide traffic activity data). (DOT, *Objectives 1a-1d*)
- Implement actions that promote exposure-avoidance behaviors in susceptible populations. (SED, OCFS, Off. of Aging) *(Objectives 1a-1d)*
- Enhance requirements for residential biomass appliances such as outdoor wood boilers via Statewide building code development. (DOS, *Objectives 1b-1d*)

- Work to integrate efforts to reduce GHG with efforts to reduce other harmful air pollutants especially in Environmental Justice areas. (DEC, *Objective 1d*)
- Consider identifying high-priority zones for GHG emission reduction strategies where the public health co-benefits of reducing other harmful air pollutants are expected to be especially large. (DEC, *Objective 1d*)

Governmental (G) and Non-Governmental (NG) Public Health

- Provide technical guidance on appropriate interventions and basis for enhanced enforcement authority. (G, *Objectives 1a-1d*)
- Increase enforcement authority of LHDs relative to residential biomass burning (e.g., outdoor wood boilers and other) appliances. (G, *Objective 1c*)
- Develop aggregate measures of harmful co-pollutant health impacts at the community level. (G, *Objective 1d*)
- Work with local communities to integrate community interests into planning decisions. (G, NG *Objectives 1a-d*)
- Provide guidance and promote healthy behaviors to providers and patients. (NG, G *Objectives 1b*)

Policymakers and Elected Officials

- Support congestion pricing through use of mechanisms such as high occupancy vehicle lanes (HOVs) and toll pricing. (*Objectives 1a, b, d*)
- Incentivize use of public transportation. (*Objectives 1a, b, d*)
- Support emission reductions at smaller commercial sources that impact the local environment (e.g., outdoor wood boilers, fast food establishments and others as needed). (*Objectives 1a-c*)
- Consider co-benefits of reducing emissions of other harmful air pollutants when evaluating GHG reduction strategies. (*Objective d*)
- Seek opportunities to incorporate requirements for reductions in sector and/or location-specific GHG and air toxic reductions when proposing legislation. (*Objectives 1a-d*)

Communities

- Support community land-use planning such as smart growth initiatives that can contribute to long-term reductions in pollutant levels from mobile sources (e.g., building bike trails, collocating residential, recreational and commercial structures, etc.). (*Objectives 1a-d*)
- Implement actions that promote exposure-avoidance behaviors in susceptible populations as policies or enhanced guidance (e.g., avoid using gas-powered equipment in the summertime at child-care, elder care settings). (*Objective 1b*)
- Consider local zoning and building-code enforcement that could contribute to reduce impact of local fine particulate matter sources such as wood-burning and other biomass appliances. (*Objective 1c*)
- Discuss concerns about local sources of air pollution during local planning and other civic activities. (*Objective 1d*)

Philanthropy

- Develop and fund programs to help simultaneously maximize reductions in harmful co-pollutants and GHG in the most vulnerable communities. (*Objective 1d*)
- Fund programs, particularly in underserved/Environmental Justice communities, that educate and empower communities to work with local and State government agencies to help identify and prioritize local sources of air toxics in their communities. (*Objective 1b, 1c, 1d*)

New York State Prevention Agenda
Promote a Healthy and Safe Environment Action Plan
Focus Area 2: Water Quality

Defining the Problem

Safe and available water for drinking and for recreation promotes healthy people, healthy communities, and a healthy economy. Priorities identified by New York State's Prevention Agenda focus on fluoridation to improve oral health, particularly in New York's more rural communities; enhanced private well monitoring and protection; efforts targeted to address New York's aging water delivery system and related infrastructure; and protecting New York's water resources for swimming and recreation.

Fluoridating drinking water is considered by the Centers of Disease Control and Prevention (CDC) as one of the ten great public health achievements of the 20th century.¹³ However optimally fluoridated public water is still not available to a large segment of New York's population, largely because of a shortage of credible and understandable information about the significant oral health benefits and low health risks associated with fluoridated water. In fact, the number of drinking water systems that fluoridate in New York State has dropped from 139 in 2009 to 125 in 2012. The health benefits of fluoridated water are greatest in high poverty areas where access to dental care can be a problem and drinking water fluoridation has a particularly high preventative value.¹⁴

Many rural areas are not served by public water supplies. About 1.5 million homes (19 percent of the population) in New York State are served by individual water supplies (e.g., private wells) that are not subject to any federal or Statewide standards for drinking water quality or testing. While private wells can provide safe and clean water, individual homeowners are responsible for protecting and maintaining them. No comprehensive sampling is required and most homeowners have insufficient information on the quality of their sources and the potential for their exposure to chemical and microbiological contaminants.

For areas served by public water, aging drinking water infrastructure is a major problem. Drinking water quality and quantity problems regularly arise in New York State communities as infrastructure is stretched to its limits or fails as a result of aging or inadequate maintenance. The conservative cost estimate for repairing, replacing and updating New York's drinking water infrastructure has been estimated at \$38.7 billion over the next 20 years.¹⁵ Without the needed repairs and updates, residents will be subjected to an increasing number and severity of drinking water-related emergencies, and an increased risk of waterborne disease.

Another significant infrastructure issue relates to small privately owned community water systems, which are being abandoned at an increasing rate, placing homeowners at health and economic risk. These privately run water systems were set up in the 1960s to 1980s by land developers. Decades later, these water systems are becoming unsustainable and may no longer be able to keep pace with potable water, sanitation, hygiene and fire protection needs.

Global climate change also places additional stressors on all of New York's waters and water supplies. Warming average temperatures, more frequent and longer heat waves, and increases in the frequency and severity of extreme weather events increase the risks of flooding, high winds, and other direct threats to people. These climate changes likely will cause increases in a variety of health outcomes, including waterborne diseases.

Climate models for the northeastern United States predict more extreme weather events that could lead to the decline in the quantity and quality of source waters used for drinking water.¹⁶ Specific concerns include increased nutrient loading from sewage, septic systems and runoff that promote an overall increase in algae and other organic material (eutrophication) of source waters and harmful blue-green algal blooms. These conditions also create related water treatment concerns, such as buildup of disinfection byproducts, which are associated with the increased risk of certain cancers and adverse reproductive outcomes.¹⁷

Finally, global climate change also impacts waters used for recreation. Three hundred and fifty beaches on the Great Lakes and the Atlantic Ocean are regularly assessed to identify sources of pollution (sanitary survey) and sampled for bacteriological water quality through funding to New York State from the USEPA Beach Act, scheduled to be eliminated at the end of the 2013 beach season. Approximately 1,100 additional regulated beaches on inland waters, which are not routinely assessed or sampled, are subject to similar risks. Conducting sanitary surveys, sampling, inspecting and monitoring water quality at beaches are important and the primary way to assure that public health is protected from exposure to waterborne disease-causing organisms that can cause health symptoms, such as diarrhea and vomiting.

Goals and Objectives for Action

The following goals and objectives for action, as well as sector level interventions, have been identified:

Goal #1: Increase the percentage of State residents that receive fluoridated drinking water.

Objective 1a: Increase the percentage of NYS residents served by community water systems that receive optimally fluoridated water by 10% from 71.4% (2012) to 78.5%. (*Data Source: CDC Water Fluoridation Reporting System*)*

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

Objective 2a: Increase the number of private drinking water wells that have been tested from 2013-2018, and characterize the Statewide public health risk posed by potentially contaminated private drinking water wells.

Objective 2b: Upgrade physical infrastructure (source, treatment, and delivery systems) in 15% of community water systems.

Objective 2c: Develop strategies to address the abandonment of small community drinking water systems.

Objective 2d: Develop strategies to address water quantity and quality challenges posed by land use and climate change

Objective 2e: Improve capacity and develop strategies to identify and assess sources of pollution that potentially affect regulated beaches.

**Objectives that are bolded are Tracking Indicators.*

Goal #1: Increase the percentage of State residents that receive fluoridated drinking water.

Levels of Health Impact Pyramid ^a	Interventions ^b
<i>Counseling and Education</i>	<ul style="list-style-type: none"> • Provide communities interested in implementing fluoridation with outreach materials and resources to promote fluoridation as a significant health intervention. • Provide training to elected officials about drinking water issues, including benefits of fluoridation
<i>Clinical Interventions</i>	<ul style="list-style-type: none"> • Stress benefits of fluoridation to patients in dental offices and health clinics. • Incentivize dental and public health professionals to intervene at a community level when the benefits of fluoridation become a public issue in communities. Find funding for involved individuals to offset travel costs and promote participation.
<i>Long-Lasting Protective Interventions</i>	<ul style="list-style-type: none"> • Develop and promote existing strategies that provide the benefits of fluoridation to people with private drinking water wells, e.g., fluoride tablets; obstetricians, pediatricians, WIC programs and others are likely partners. • Provide funding for public water suppliers to install or upgrade fluoridation equipment. The Medicaid Redesign Team has proposed one possible method, by redirecting Medicaid savings to a fund exclusively for this purpose. Other funding methods could be explored.
<i>Changing the Context to Make Individuals' Decisions Healthy</i>	<ul style="list-style-type: none"> • Ensure NYSDOH and partners provide best available public information regarding fluoridation.
<i>Socioeconomic Factors</i>	<ul style="list-style-type: none"> • Create fiscal incentives for local governments to promote fluoridation. Consider a discount in Medicaid contributions, or a State-funded offset, for counties that have at least 80 percent of their population receiving either optimally fluoridated water or fluoride supplements.

^aFrieden T. "A Framework for Public Health Action: The Health Impact Pyramid". *American Journal of Public Health*. 2010; 100(4): 590-595.

^bInterventions in boldface type have been proposed for prioritization.

Goal #2: Reduce potential public health risks associated with drinking water and recreational water

Levels of Health Impact Pyramid ^a	Interventions ^b
Counseling and Education	<ul style="list-style-type: none"> • Develop outreach materials for families, and private well owners, preschools and others about importance of well testing, to target at risk populations. • Provide education to elected officials on the importance and need for asset management at community water systems to ensure the long-term sustainability of the systems infrastructure. • Develop or enhance scientific curricula for primary and secondary school science classes on long-term impacts of, and adaptation to, climate change. • Develop outreach materials to educate the public about what is lost by eliminating EPA BEACH Act funding and why continued sampling is necessary. • Develop outreach materials for proper maintenance and operation of waste disposal systems for protection of recreational water from contamination. • Develop toolkit for State district office and local health departments to use to conduct sanitary surveys and monitor water quality at regulated beaches.
Clinical Interventions	<ul style="list-style-type: none"> • Provide resources to obstetrics and gynecologists to raise awareness of new parents about importance of private drinking water well testing.
Long-Lasting Protective Interventions	<ul style="list-style-type: none"> • Develop strategies to retrofit or replace private drinking water wells that do not meet existing well construction requirements in 10 NYCRR, Appendix 5-B (Standards for Water Wells) or that are found to have water quality problems. • Support infrastructure upgrades through funding mechanisms, such as the Drinking Water State Revolving Fund, and identify additional mechanisms to create fiscal incentives for local governments to update aging infrastructure. • Promote or require long-range local level planning, including asset management planning for the long-term sustainability of water utilities infrastructure. • Provide technical support to help restore failing privately owned public water systems. • Promote water rate structures that provide for system stability and long-term sustainability. • Perform research to better quantify projected impacts of climate change on water quantity and quality, especially on the formation of harmful algal blooms and eutrophication that could warrant water monitoring and treatment. • Perform research to better quantify projected impacts of land use and land development on water quantity and quality. • Develop enforceable codes for water conservation during extended periods of drought. Consider model codes adoptable at local levels, or a Statewide approach that local governments can use for enforcement. • Develop water rate structures that foster water conservation across all sectors. • Develop additional incentives for farm operations to improve collection and retention of agricultural runoff. • Identify strategies to improve techniques designed for minimizing fertilizer

	<p>application.</p> <ul style="list-style-type: none"> • Identify resources to support beach assessments and a water quality monitoring program by State district offices and local health departments • Develop new, or enhance existing, relationships with lake associations and other such partners and identify potential mechanisms for these groups to continue monitoring activities • Enforce standards for proper design, location and operation of sewage disposal systems.
<p><i>Changing the Context to Make Individuals' Decisions Healthy</i></p>	<ul style="list-style-type: none"> • Carry out research to quantify and identify contamination and the sources of the contamination present in private drinking water wells Statewide. • Work with the real estate industry to promote well testing when a house is bought or sold. • Promote sustainable infrastructure through public education and promotional campaigns • Promote local government actions to address abandoned privately owned public drinking water systems, through education, technical assistance and funding. • Consider revising the water transportation corporation law to include a financial guaranty requirement and title transfer assurance to the local government in the event the water utility is abandoned or not maintained. • Provide public education material that summarizes projected impacts of climate change on New York water, and provides information about what people can do to help mitigate these impacts. • Promote better land use practices across all sectors. • Create incentives for individuals and businesses to move out of flood-prone areas. • Monitor trends and patterns in waterborne-related illness associated with NYS regulated beaches previously monitored with EPA BEACH Act funding. The monitoring has the co-benefits of potentially identifying health risks from other exposures (e.g., shellfish) and protecting vulnerable populations that are at higher risk (e.g., children) • Develop a system to track sanitary survey and water quality monitoring data for regulated beaches that can inform decision-making.
<p><i>Socioeconomic Factors</i></p>	<ul style="list-style-type: none"> • Provide financial assistance (especially in rural areas) to improve ability for private individuals to maintain private drinking water wells.
<p>^a Frieden T. "A Framework for Public Health Action: The Health Impact Pyramid". <i>American Journal of Public Health</i>. 2010; 100(4): 590-595</p> <p>^b Interventions in boldface type have been proposed for prioritization</p>	

Interventions by Sector

Change can be made across the sectors identified below to improve health outcomes related to water quality. Below are examples of how your sector can make a difference.

Healthcare Delivery System

Goal #1: Increase the percentage of State residents that receive optimally fluoridated drinking water.

- Provide information about the benefits of fluoridation to patients. *(Objective 1a)*
- Mobilize dental and public health professionals to intervene at a community level when the benefits of fluoridation become a public issue in communities. *(Objective 1a)*

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Direct new parents to appropriate literature and ask new parents whether private drinking water well has been tested. *(Objective 2a)*

Employers, Businesses, and Unions

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Identify strategies to improve techniques for minimizing fertilizer application (e.g., comprehensive nutrient management, precision feed management). *(Objectives 2d and 2e)*
- Work with real estate industry to increase private well testing when a house is bought or sold, with emphasis on inexpensive indicator contaminants for the specific area (e.g., nitrate, radon in some areas). *(Objective 2a)*

Media

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Promote sustainable infrastructure through public education and promotional campaigns focused on aging infrastructure, global warming impacts, and other drinking water and water resource impacts. *(Objectives 2b-2c)*

Academia

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Perform research to better quantify projected impacts of climate change on water quantity and quality, especially on the formation of harmful algal blooms and eutrophication that could warrant water monitoring and treatment. *(Objectives 2d-2e)*
- Perform research to better quantify projected impacts of land use and land development on water quantity and quality. *(Objectives 2d-2e)*

Community-Based Organizations

Goal #1: Increase the percentage of State residents that receive optimally fluoridated drinking water.

- Provide information for private well owners to determine fluoride levels in their wells, and how to factor this into decisions made with their dentists on supplemental fluoride regimes. *(Objective 1a)*

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Provide basic drinking water education material so that individual consumers can identify their sources of drinking water and, if necessary, seek or initiate appropriate interventions on their own. *(Objectives 2a-d)*
- Target outreach materials in areas with private drinking water wells to promote testing and other well maintenance issues. *(Objective 2a)*

Other Governmental Agencies

Goal #1: Increase the percentage of State residents that receive optimally fluoridated drinking water.

- Support communities interested in implementing fluoridation with outreach materials and links to needed resources. *(Objective 1a)*
- Support elected and other public officials with readily available training on fluoridation and other drinking water issues (co-benefit on infrastructure issues). *(Objective 1a)*

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Provide education to elected officials on the importance and need for asset management at community water systems to ensure the long-term sustainability of the systems infrastructure. *(Objectives 2b-d)*
- Develop outreach materials to educate the public why beach sampling is necessary. *(Objective 2e)*
- Develop outreach materials for proper maintenance and operation of waste disposal systems for protection of recreational water from contamination. *(Objectives 2d-2e)*
- Promote long range local level planning, including asset management planning through education, technical assistance, funding conditions, etc. *(Objectives 2a-2e)*
- Provide support to help restore failing privately owned public water systems (e.g. direct technical assistance, locally provided replacement operators). *(Objectives 2d-2e)*
- Promote water rate structures that provide for system stability and long-term sustainability. *(Objective 2b-2d)*
- Continue, expand and/or develop new strategies such as land use practices and controls, well head protections, etc., to avoid or mitigate identified water quality impacts. *(Objectives 2a-2d)*
- Identify resources to support beach assessments and a water-quality monitoring program by State district offices and local health departments. *(Objective 2e)*
- Enforce standards for proper design, location and operation of sewage disposal systems. *(Objective 2a-2e)*
- Carry out necessary research to quantify and identify contamination and the sources of the contamination present in private drinking water wells Statewide. *(Objectives 2a, 2d)*
- Develop outreach materials that provide best practices and resources for the maintenance and operation of a private drinking water well. *(Objectives 2a, 2d)*
- Provide improved public education material that clearly summarizes projected impacts of climate change on water resources, and provides information the public can use to help mitigate these impacts. *(Objectives 2a-2e)*
- Promote better land use practices across all sectors (e.g., through public and targeted sector education). *(Objectives 2a-2e)*
- Monitor trends and patterns in waterborne-related illness associated with NYS regulated beaches previously monitored with EPA BEACH Act funding. The monitoring has the co-benefits of potentially identifying health risks from other exposures (e.g. shellfish) and protecting vulnerable populations that are at higher risk (e.g., children). *(Objective 2e)*

Governmental (G) and Non-Governmental (NG) Public Health

Goal #1: Increase the percentage of State residents that receive optimally fluoridated drinking water.

- Redirect Medicaid savings to a fund exclusively for public water suppliers to install or upgrade fluoridation equipment, as described in the Medicaid Redesign Team proposal. (G) (NG) *(Objective 1a)*
- Ensure NYSDOH and partners provide best-available public information regarding fluoridation. (G) *(Objective 1a)*

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Use outreach materials and social media for families, preschools and others on private wells, targeting at risk populations about the need for well testing. (G) (NG) *(Objective 2a)*
- Identify and implement new preventative and mitigative measures as needed to reduce health risks from drinking water contamination. (G) (NG) *(Objectives 2d-2e)*

Policymakers and Elected Officials

Goal #1: Increase the percentage of State residents that receive optimally fluoridated drinking water.

- Create fiscal incentives for county governments to promote optimal fluoridation. Consider a discount in Medicaid contributions, or a State-funded offset, for counties that have at least 80 percent of their population receiving either optimally fluoridated water or fluoride supplements. *(Objective 1a)*

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Support infrastructure upgrades through mechanisms such as the Drinking Water State Revolving Fund and identify additional mechanisms to create fiscal incentives for local governments to update aging infrastructure. *(Objectives 2b-2d)*
- Develop enforceable codes for water conservation during extended periods of drought. Consider model codes adoptable at local levels or a Statewide approach that local governments can use for enforcement. *(Objectives 2b-2d)*
- Develop and promote water rate structures that foster water conservation across all sectors. *(Objectives 2b-2d)*
- Develop additional incentives for farm operations to improve collection and retention of agricultural runoff. *(Objectives 2a-2e)*
- Revise the Water Transportation Corporation Law, to include a financial guaranty requirement and title transfer assurance to the local government in the event the water utility is abandoned or not maintained. *(Objective 2c)*
- Create incentives for private individuals and businesses to move out of flood-prone areas (e.g., buyout programs). *(Objectives 2d-2e)*

Communities

Goal #2: Reduce potential public health risks associated with drinking water and recreational water.

- Develop strategies to retrofit or replace private drinking water wells that do not meet existing well construction requirements in 10 NYCRR [Appendix 5-B](#) (Standards for Water Wells) or that are found to have water quality problems. *(Objective 2a)*
- Develop new, or enhance existing, relationships with lake associations and other, such partners and identify potential mechanisms for these groups to continue monitoring and outreach activities that protect New York's water resources. *(Objectives 2d-2e)*

Promote local government activities to address abandoned privately owned public drinking water systems, through education, technical assistance and funding. *(Objective 2c)*

Goal #1: Increase the percentage of State residents that receive optimally fluoridated drinking water.

- Allocate funding for involved individuals (e.g., members of the dental community) to offset travel costs and promote participation in education about benefits of fluoridated drinking water. *(Objective 1a)*
- Invest in strategies for alternative fluoridation options. *(Objective 1a)*
- Provide funding to upgrade fluoridation equipment. *(Objective 1a)*

New York State Prevention Agenda
Promote a Healthy and Safe Environment Action Plan
Focus Area 3: Built Environment

Defining the Problem

The ‘built environment’ includes homes, schools, workplaces, public and commercial buildings, transit systems, multi-use trails, roadways, streetscapes and parks.¹⁸ How the built environment is designed and maintained can affect human health through the products and materials used and through land use, zoning, economic development and infrastructure decisions that affect access to nutritious food and opportunities for physical activity.^{19,20}

At the neighborhood level, sidewalks, cross-walks, multi-use trails, safe streets, “complete streets,” inter-connected streets and trails and public transportation are associated with physical activity,^{21,22} energy usage²³ and the risk of being overweight or obese, especially among children, adolescents and the elderly.^{24,25} These factors are also associated with decreased risks of heart disease, hypertension, stroke, Type-2 diabetes, colon and breast cancer, falls, metabolic syndrome.²⁶ Many low-income communities and communities of color have disproportionately less access to public transportation, green and open space, recreational facilities, safe streets and healthy foods. These communities also experience elevated rates of obesity, diabetes, cardiovascular disease and mortality.^{27,28,29} Additionally, many neighborhoods and buildings aren’t designed to accommodate the needs of the elderly and disabled.

The way we arrange the different land uses listed above – in relation to transportation systems, the natural environment, and one another – also determines the degree to which residents can engage in physical activity. Thus, safe and comfortable streets must be matched with proper land use, zoning and development that bolsters and complements active living. In this regard, ‘smart growth’ planning offers several planning and design principles that support this goal – including, strategically-targeted density; mixed land uses; inter-connected street and trail networks; and safe, accessible and well-maintained public spaces.

“Traffic-calming” measures can integrate transportation improvements and land use design to support physical activity. The Institute of Traffic Engineers defines traffic-calming as follows: Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users.”³⁰ Examples include: landscaped medians that force drivers to slow down and allow safer mid-street havens to pedestrians to cross; well-designed raised cross-walks; buildings close to the sidewalk matched with on-street parking and sidewalk landscaping – this provides safe enclosures for pedestrians to travel and congregate; well-designed traffic circles and rotaries (‘roundabouts’); narrower vehicle lanes, which slows, but does not congest, traffic; and human-scaled traffic signs, signals and lighting structures, among others.

At the building level, the use of toxic products, structural issues, inadequate ventilation, heating and cooling systems, and deferred maintenance can create health and safety hazards. Many housing-related issues can pose a threat to human health, including carbon monoxide, peeling and chipping lead-based paint, fire and electrical hazards, mold, radon, poor indoor air quality, pests and pesticides.³¹ These hazards can result in health effects including poisoning, fall and fire related injury and death, and lung diseases such as asthma and cancer.³² Housing is an especially important part of the built environment because some of the most

vulnerable populations (e.g. children, elderly, and infirmed) spend the most time in their homes. Four key housing-related health issues are asthma, childhood lead exposure, fire-related injuries and carbon monoxide poisoning.

A number of housing-related hazards, such as mold, cockroaches and environmental tobacco smoke can trigger asthma. Asthma affects an estimated one in eleven New Yorkers (1.3 million adults and 475,000 children). Asthma prevalence among adults increased from 6.3 percent in 1999 to 8.7 percent in 2008. Asthma prevalence, ED visits and hospitalization rates are higher in New York State than nationally. Children in New York State miss more than 1.9 million days of daycare, pre-school or school due to asthma each year. In 2008, adults with asthma reported approximately 7.6 million days when they were unable to work or carry out usual activities because of asthma.³³ Although not all asthma is housing-related, asthma control programs focused on improving the home environment (e.g., environmental assessment; education; use of mattress and pillow covers; use of HEPA vacuums and HEPA air filters; smoking cessation and reduction in environmental tobacco smoke; cockroach and rodent management; minor repairs, and intensive household cleaning) have been shown to have health and financial benefits.^{34,35,36}

Childhood lead poisoning is another preventable housing-related condition. New York consistently ranks high on key risk factors associated with lead poisoning, including childhood poverty, a large immigrant population, and an older, deteriorated housing stock. Although the overall incidence of newly diagnosed cases of lead poisoning among New York State children under age six has steadily declined over the past four decades, thousands of children are still at risk. In 2008, over 3000 children under age six were newly identified with blood lead levels (BLLs) 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) and above; 80 percent resided in just 13 of the States' poorest counties with the oldest housing stock.³⁷

Residential fires are among the leading causes of injury and death among children and the elderly.³⁸ A primary risk factor in residential fire injuries and deaths is the absence of a working smoke alarm. Residential smoke alarm legislation has been shown to be effective in increasing the prevalence of working smoke detectors in a home.³⁹ When a fire occurs in a residential setting, a working smoke alarm can reduce fatal injuries by 40 to 50 percent.⁴⁰ Carbon monoxide (CO) poisoning is another potential housing-related health problem, especially following severe weather events that result in power outages and can lead to improper use of portable generators.^{41,42} As an example, one early-season storm in 2006 resulted in 14 percent of the emergency department visits for non-fire-related CO poisoning in NYS for that year.⁴³ Each year, approximately 200 people in New York are hospitalized due to accidental CO poisoning. About one-third of poisonings result from fires and two-thirds result from fuel-burning equipment and appliances.⁴⁴ CO poisoning is preventable with safe use of generators, boiler maintenance, and installation and maintenance of CO alarms; and prompt treatment if overexposure occurs. Delayed treatment can result in neurological problems.⁴⁵

Climate change (e.g., extreme weather episodes, increased coastal flooding and storms) contributes to adverse health impacts of the built environment. For example, storms and subsequent power outages increase the risk of CO poisoning⁴⁶; and extreme heat episodes disproportionately impact the poor and elderly population, who may be unable to afford the additional cost of air conditioning.⁴⁷

Built environments that discourage physical activity can also increase energy consumption, and thus contribute to adverse climate impacts and decreased air quality. For example, lack of access to public transit

and lack of safe, well-lit streets promotes driving over more sustainable forms of transportation. Children who live in neighborhoods without safe access to spaces for recreation spend more time in front of the television (TV) and computer (PC).⁴⁸ TV and PC use are significant sources of increased home energy consumption.⁴⁹

Finally, half of the top ten risk factors for chronic disease in high income countries (including the US) are influenced by the built environment: overweight and obesity, ranks third; physical inactivity, ranks fourth; low fruit and vegetable intake, ranks seventh; exposure to urban air pollutants, ranks eighth; and occupational risks, ranks tenth.⁵⁰ The priority areas for intervention are improving the design and maintenance of home environments and improving the transportation infrastructure.

Goals and Objectives for Action

The Built Environment Focus Area Committee identified the following goals and objectives for action as well as sector level interventions to implement the identified goals and objectives:

Goal #1: Improve the design and maintenance of the built environment to promote healthy lifestyles, sustainability and adaptation to climate change.

Objective 1a: By December 31, 2017, increase the percentage of the population that lives in a jurisdiction that adopted the Climate Smart Communities pledge by 20% from 26.7% to 32.0% (Year: 2012; Data Source: NYS DEC Program Tracking, available at: <http://www.dec.ny.gov/energy/56876.html>; State, county).*

Objective 1b: By December 31, 2017, increase the proportion of people who commute using alternate modes of transportation, i.e., public transportation, carpool, bike/walk, telecommute, by 10% from 44.7% to 49.2%. (2007-2011 5-yr. estimate; Data Source: US Census, American Community Survey; Data Availability: State, county)*

Objective 1c: By December 31, 2017, improve access to affordable fruits and vegetables among low-income NYS residents by decreasing the percentage who live greater than 1 mile from a supermarket or grocery store in urban areas, or greater than 10 miles from a supermarket or grocery store in rural areas, by 10% from 2.49% to 2.24%. (Year: 2010; Data Source: US Department of Agriculture Food Environment Atlas; Data Availability: State, county)*

Objective 1d: By December 31, 2017, reduce the number of crash-related pedestrian fatalities by 10% from 1.4 (2007-2009) to 1.25 per 100,000 people.^a (Data Source: NYS Vital Statistics)

Objective 1e: Improve pedestrian and bicycling infrastructure by addressing financial and other barriers to investing in pedestrian and bicycling networks, especially in low-income communities.

Objective 1f: Integrate active transportation network to increase accessibility to destinations, such as grocery stores, schools, shops, and restaurants.

Objective 1g: Increase access to bike paths, hiking trails, open green spaces, recreational facilities, particularly among low-income communities.

Objective 1h: Reduce health impacts associated with extreme weather incidents, especially among vulnerable populations.

Objective 1i: Increase the percent/number of buildings that meet the US Green Building Council's LEED (Leadership in Energy and Environmental Design) green building and neighborhood standards, or any other comparable set of standards.

^aThis objective and its target are consistent with a similar one in the NYS DOT Strategic Highway Safety Plan, although the NYS DOT goal year for achieving the objective is 2014.

Goal #2: Improve the design and maintenance of home environments to promote health and reduce related illness.

Objective 2a: By December 31, 2017, increase the percentage of homes in vulnerable neighborhoods that have fewer asthma triggers during Healthy Neighborhood Program home revisits by 55% from 12.9% to 20%. (*Data Source: NYS DOH, Healthy Neighborhoods Program Tracking; Data Availability: select counties*)*

Objective 2b: Reduce by 20% the number of non-fire-related carbon monoxide poisonings resulting in hospitalizations. (*Baseline: 125/year*)

Objective 2c: Reduce the incidence of elevated blood lead levels among children in high-risk neighborhoods and from populations and by 10%.

Objective 2d: Increase the number of housing units that contain at least one functional smoke and one functional carbon monoxide detector.

**Objectives that are bolded are a Tracking Indicator.*

Goal #1: Improve the design and maintenance of the built environment to promote healthy lifestyles, sustainability and adaption to climate change

Levels of Health Impact Pyramid ^a	Interventions ^b
Counseling and Education	<ul style="list-style-type: none"> • Develop targeted education and outreach materials to key audiences, such as clinicians, teachers, employers, property owners, local planning and zoning boards on the impact of the built environment and climate change on health. Material should include intensive strategies for vulnerable populations, e.g. poor, elderly, and children. • Conduct school, workplace and community-based physical education programs. • Expand warning network with the meteorological community to incorporate carbon monoxide alerts before an impending weather disaster.
Clinical Interventions	<ul style="list-style-type: none"> • Provide expanded emergency services for vulnerable populations during extreme weather incidents.
Long-Lasting Protective Interventions	<ul style="list-style-type: none"> • Implement the Smart Growth Public Infrastructure Policy Act, which requires consideration of smart growth principles when planning and funding investments, as well as the Complete Streets Law, which requires focused consideration of bicycle and pedestrian elements within street design. • Seek opportunities to incorporate guidance and recommendations from other existing programs and guidelines, such as DOS local waterfront revitalization program, DEC Climate Change Program, NY Sun Initiative, NYSERDA programs. • Provide accessible, neighborhood cooling centers.
Changing the Context to Make Individuals' Decisions Healthy	<ul style="list-style-type: none"> • Seek opportunities to promote compliance with and enforcement of existing laws and ordinances, such as NYS Smart Growth Infrastructure Act; NYS Complete Streets. • Construct and maintain safe sidewalks, bike lanes, recreational facilities, parks and other amenities, especially in low-income communities. • Inspect, maintain and upgrade surface transit as needed. • Expand tracking and surveillance to promote better land use planning and respond to local needs, e.g., services for vulnerable populations, community environmental amenities and health risks, response to extreme weather events. • Incorporate 'smart growth' into SEQR process.
Socioeconomic Factors	<ul style="list-style-type: none"> • Provide incentives for sustainable and climate smart planning, zoning and development, including transportation, e.g., increase the amount and mix of development within one-half mile of commuter rail and rapid-transit bus stations. • Promote progressive codes and incentives for 'green buildings' (e.g. solar and other on-site renewable power, green roofs to maximize energy efficiency and resilience to climate change). • Explore penalties for carbon-promoting, unsustainable building. • Offer subsidies and other incentives to increase availability of healthy food in low income communities. • Provide incentives for Brownfield Opportunity Areas.

^aFrieden T., "A Framework for Public Health Action: The Health Impact Pyramid". *American Journal of Public Health*. 2010; 100(4): 590-595

^bInterventions in boldface type have been proposed for prioritization

Goal #2: Improve the design and maintenance of home environments to promote health and reduce related illness

Levels of Health Impact Pyramid ^a	Interventions ^b
<i>Counseling and Education</i>	<ul style="list-style-type: none"> • Develop targeted educational programs and materials about exposures, health risks and effective control strategies for hazards in homes, schools and other indoor environments. • Support educational efforts aimed at primary care providers to assess risks, screen, and provide follow-up treatment, using NHLBI asthma, NYS, CDC-lead poisoning and other relevant guidelines, for building-related exposures and illnesses, e.g., lead poisoning, asthma and allergies. • Enhance mechanisms for referrals to support services, such as the Healthy Neighborhood Program. • Up-to-date information on home-related hazards, diagnoses and treatments, in clinical and other professional for initiated and continuing education (CE credits). • Incorporate ‘Healthy Homes’ education and inspections into other (non-health) ‘opportunity points’, e.g., building inspections, firefighters annual fall fund drives, installation and inspection of CO alarms.
<i>Clinical Interventions</i>	<ul style="list-style-type: none"> • Primary care providers should assess risks, screen, and provide follow-up treatment, using NHLBI-asthma, NYS, CDC-lead poisoning and other relevant guidelines, for building-related exposures and illnesses, e.g., lead poisoning, asthma, allergies, and provide referrals to support services, e.g., Healthy Neighborhood Program. • Establish and disseminate best practices for environmental history taking, treatment and diagnosis. • Implement the Medicaid Redesign Team recommendations to provide home assessments, e.g., for children in at risk housing with asthma.
<i>Long-Lasting Protective Interventions</i>	<ul style="list-style-type: none"> • Encourage home and building modifications, such as weatherization, CO alarms, smoke detectors, fire alarms, and other safety mechanisms. • Conduct activities and programs that enhance building inspection and maintenance, e.g., to address water infiltration, mold, peeling paint and vermin. • Contact activities and programs that provide clean energy sources in homes, schools and other buildings, e.g., low sulfur heating oil.
<i>Changing the Context to Make Individuals’ Decisions Healthy</i>	<ul style="list-style-type: none"> • Enforce compliance with existing property maintenance, building, fire and related codes, e.g., boilers, lead paint. • Comply with safe building renovation guidelines. • Restrict usage of high particulate and sulfur burning fuels. • Formalize communication, as regarding: referrals, inspections, remediation and enforcement, between housing, building, fire, health and related agencies. • Provide insurance, including Medicare and Medicaid reimbursement, for home assessments and interventions. • Seek coalition and partnership-building activities, e.g., between health, housing, advocacy and medical sectors, to share information about low-cost, effective assessment and control strategies.

**Socioeconomic
Factors**

- Provide incentives for compliance with and enforcement of existing housing and building code, especially in high-risk housing.
- Increase resources for healthy neighborhood and other related programs to conduct home assessments, provide free or low cost safety measures, e.g., CO alarms, smoke detectors and remediation, such as water infiltration.

^a Frieden T., "A Framework for Public Health Action: The Health Impact Pyramid". *American Journal of Public Health*. 2010; 100(4): 590-595

^b Interventions in boldface type have been proposed for prioritization

Interventions by Sector

Changes can be made across the sectors identified below to improve health outcomes related to the built environment. Below are examples of how your sector can make a difference.

Healthcare Delivery System

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Provide targeted education on the impact of the built environment on health (e.g., clinicians, patients, teachers, employers, property owners, local planning and zoning boards). *(Objectives 1a-1g)*
- Conduct patient assessments on the impact of the built environment. *(Objectives 1b)*

Goal #2: Improve home environment.

- Provide targeted information on home related hazards to patients. *(Objectives 2a-2d)*
- Offer insurance coverage for assessment and intervention. *(Objectives 2a-2d)*
- Provide up-to-date information on home-related hazards, diagnosis and treatment in clinical and other professional initial and continuing education (CE credits). *(Objectives 2a-2d)*
- Ensure that primary care providers (PCPs) assess risks, screen, and provide follow-up treatment (using NHLBI-asthma, NYS, CDC-lead poisoning and other relevant guidelines) for building-related exposures and illnesses, e.g., lead poisoning, asthma, allergies, and referrals to support services (e.g., Healthy Neighborhood Program). *(Objectives 2a, 2b, 2c)*
- Establish and disseminate best practices for environmental history taking, treatment and diagnosis. *(Objectives 2a-2d)*
- Participate in coalition and partnership-building (e.g., between health, housing, advocacy and medical sectors) to share information about low-cost, effective assessment and control strategies. *(Objectives 2a-2d)*

Employers, Businesses, and Unions

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Provide workplace/member health promotion programs. *(Objectives 1b)*
- Conduct employee/member training. *(Objectives 1b)*
- Offer free products and training, e.g., healthy food, bikes, classes. *(Objective 1b, 1g)*
- Provide targeted education on the impact of the built environment on health (e.g., clinicians, teachers, employers, property owners, local planning and zoning boards). *(Objective 1a-1i)*
- Offer school-, workplace and community-based physical education programs. *(Objective 1b)*

Goal #2: Improve home environment.

- Donate 'healthy' products. *(Objectives 2a, 2d)*
- Comply with building, housing and other codes. *(Objectives 2a-2d)*
- Provide clean energy sources in homes, schools and other buildings (e.g., low sulfur heating oil). *(Objectives 2a-2d)*
- Support compliance/enforcement of existing property maintenance, building, fire and related codes (e.g. boilers, lead paint). *(Objectives 2a-2d)*

Media

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Publicize warning network, e.g., extreme weather. *(Objective 1h)*
- Provide public education. *(Objective 1a-1i)*

- Promote successes/Model programs. *(Objective 1a-1i)*
- Publicize risk factors and steps to improve home environment. *(Objective 1h)*
- Support a warning network with the meteorological community to incorporate CO warnings into their alerts before an impending weather disaster. *(Objective 1h)*

Goal #2: Improve home environment.

- Publicize warning network, e.g., CO. *(Objectives 2b)*
- Promote successes/model programs. *(Objectives 2a-2d)*
- Publicize risk factors and steps to improve home environment. *(Objectives 2a-2d)*

Academia

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Offer professional training. *(Objective 1a-1i)*
- Provide continuing education. *(Objective 1a-1i)*
- Evaluate and publish effective interventions and programs. *(Objective 1a-1i)*
- Assist with tracking and surveillance, e.g., vulnerable populations during extreme weather events, community environmental amenities and health risks. *(Objective 1h)*

Goal #2: Improve home environment.

- Offer professional training. *(Objectives 2a-2d)*
- Provide continuing education. *(Objectives 2a-2d)*
- Conduct evaluation and dissemination about effective interventions and programs. *(Objectives 2a-2d)*
- Support a warning network with the meteorological community to incorporate CO warnings into their alerts before an impending weather disaster. *(Objective 2b)*

Community-Based Organizations

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Provide staff/client education. *(Objective 1a-1i)*
- Offer 'Green' and healthy living programming. *(Objective 1a-1i)*
- Advocate for resources, programs and facilities. *(Objective 1a-1i)*
- Offer public education about the impact of the built environment and climate change on health, with intensive strategies for vulnerable populations, e.g., poor, infirmed, elderly, children. *(Objective 1a-1i)*

Goal #2: Improve home environment.

- Train staff and clients to recognize health and environmental issues and make referrals. *(Objectives 2a-2d)*
- Develop targeted educational programs and materials about exposures, health risks and effective control strategies for hazards in homes, schools and other indoor environments. *(Objectives 2a-2d)*
- Incorporate 'Healthy Homes' education and inspections into other (non-health) 'opportunity points', for example, building inspections, firefighters annual fall fund drive, i.e., installation and inspection of CO alarms. *(Objectives 2a-2d)*

Other Governmental Agencies

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change

- Support climate change, complete streets, waterfront revitalization programs. *(Objective 1a, 1b, 1e, 1f, 1g)*

- Offer school-, workplace and community-based physical education programs. *(Objective 1b)*
- Construct and maintain safe sidewalks, bike lanes, recreational facilities, parks and other amenities, especially in low-income communities. *(Objective 1e, 1f, 1g, 1i)*
- Increase public lands designated for public recreation, particularly in low-income communities. *(Objective 1e)*
- Provide on-going inspection, maintenance and upgrade of surface transit. *(Objective 1b, 1f)*
- Issue penalties for promoting carbon, unsustainable building. *(Objective 1a)*
- Offer subsidies and other incentives to increase availability of healthy food in low-income communities. *(Objective 1c)*

Goal #2: Improve home environment.

- Provide insurance coverage including Medicaid and Medicare reimbursement for home assessments and interventions. *(Objectives 2a-2d)*
- Incorporate 'Healthy Homes' education and inspections into other non-health opportunity points, e.g., building inspections, firefighters' annual fall fund drives, such as, installation and inspection of CO alarms. *(Objectives 2a-2d)*
- Provide home and building modifications, e.g., weatherization, CO alarms, smoke detectors, safety. *(Objectives 2a-2d)*
- Conduct ongoing building inspection and maintenance, e.g., to address water infiltration, mold, peeling paint and vermin. *(Objectives 2a-2d)*
- Support clean energy sources in homes, schools and other buildings, e.g., low-sulfur heating oil. *(Objectives 2a-2d)*
- Comply with and enforce existing property maintenance, building, fire and related codes, e.g., boilers, lead paint. *(Objectives 2a-2d)*
- Participate in coalition and partnership building, e.g., between health, housing, advocacy and medical sectors, to share information about low-cost, effective assessment and control strategies. *(Objectives 2a-2d)*
- Offer incentives for compliance with and enforcement of existing housing and building code, especially in high-risk housing. *(Objectives 2a-2d)*

Governmental and Non-Governmental Public Health

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Provide surveillance analysis and tracking of risks and health outcomes. (G) (NG) *(Objective 1b, 1c, 1d)*
- Make emergency services available. (G) (NG) *(Objective 1h)*
- Provide public education about the impact of the built environment and climate change on health, with intensive strategies for vulnerable populations, e.g., poor, infirmed, elderly, and children. (G) (NG) *(Objective 1a, 1b, 1e, 1f, 1g, 1i)*
- Provide emergency services for vulnerable populations during extreme weather incidents. (G) (NG) *(Objective 1h)*
- Provide tracking and surveillance (e.g. vulnerable populations during extreme weather events; community environmental amenities and health risks). (G) (NG) *(Objective 1h)*
- Incorporate 'smart growth' into SEQR process. (G) *(Objective 1a, 1b, 1e, 1f, 1g, 1i)*
- Offer incentives for Brownfield Opportunity Areas. (G) *(Objective 1a, 1b, 1e, 1f, 1g, 1i)*

Goal #2: Improve home environment.

- Provide surveillance, analysis and tracking of risks and health outcomes. (G) (NG) *(Objectives 2a-2d)*
- Ensure home assessments. (G) (NG) *(Objectives 2a-2d)*
- Support educational efforts aimed at primary care providers to assess risks, screen, and provide follow-up treatment (using NHLBI asthma, NYS, CDC-lead poisoning and other relevant guidelines) for building-related exposures and illnesses (e.g. lead poisoning, asthma, allergies). (G) (NG) *(Objectives 2a-2d)*
- Develop targeted educational programs and materials about exposures, health risks and effective control strategies for hazards in homes, schools and other indoor environments. (G) (NG) *(Objectives 2a-2d)*
- Enhance mechanisms for referrals to support services, for example, Healthy Neighborhood Program. (G) (NG) *(Objectives 2a-2d)*
- Offer up-to-date information on home-related hazards, diagnosis and treatment in clinical and other professional initial and continuing education (CE credits). (G) (NG) *(Objectives 2a-2d)*
- Incorporate 'Healthy Homes' education and inspections into other (non-health) 'opportunity points', e.g., building inspections, firefighters annual fall fund drives, i.e., installation and inspection of CO alarms. (G) (NG) *(Objectives 2a-2d)*
- Implement the Medicaid Redesign Team recommendations to provide home assessments, e.g., for children in at risk housing with asthma. (G) *(Objectives 2a-2d)*
- Provide a warning network with the meteorological community to incorporate CO warnings into their alerts before an impending weather disaster. (G) (NG) *(Objective 2b)*
- Conduct ongoing building inspection and maintenance, e.g., to address water infiltration, mold, peeling paint, vermin. *(Objectives 2a-2d)*
- Formalize communication, for example regarding referrals, inspections, remediation, and enforcement, between housing, building, fire, health and related agencies. (G) (NG) *(Objectives 2a-2d)*
- Participate in coalition and partnership building, e.g., between health, housing, advocacy and medical sectors, to share information about low-cost, effective assessment and control strategies. (G) (NG) *(Objectives 2a-2d)*
- Strengthen support for Healthy Neighborhood and other related programs to conduct home assessments, provide free or low cost safety measures, e.g., CO alarms, smoke detectors, and remediation, such as water infiltration. (G) *(Objectives 2a-2d)*

Policymakers and Elected Officials

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Strengthen and expand Smart Growth, Complete Streets and related initiatives. *(Objective 1a, 1b, 1e, 1f, 1g, 1i)*
- Subsidize smart growth projects. *(Objective 1a, 1b, 1e, 1f, 1g, 1i)*
- Offer targeted education on the impact of the built environment on health, for example, clinicians, teachers, employers, property owners, local planning and zoning boards. *(Objective 1a-1i)*
- Comply with and enforce existing laws and ordinances, e.g., NYS Smart Growth Infrastructure Act or NYS Complete Streets. *(Objective 1a)*
- Incorporate 'smart growth' into SEQR process. *(Objective 1a, 1b, 1e, 1f, 1g, 1i)*
- Offer incentives for sustainable and climate smart planning, zoning and development, incl. transportation. *(Objective 1a, 1b, 1e, 1f, 1g)*

- Develop progressive codes and incentives for ‘green buildings’, such as, solar and other on-site renewable power, green roofs to maximize energy efficiency and resilience to climate change. *(Objective 1a)*
- Issue penalties for promoting carbon, unsustainable building. *(Objective 1a)*
- Offer subsidies and other incentives to increase availability of healthy food in low-income communities. *(Objective 1c)*
- Offer subsidies and other incentives to increase access to parks in low-income communities. *(Objective 1e, 1f, 1g)*
- Increase public lands designated for public recreation, particularly in low-income communities. *(Objective 1e, 1f, 1g)*

Goal #2: Improve home environment.

- Strengthen and expand housing standards. *(Objectives 2c, 2d)*
- Subsidize home repairs in low-income housing. *(Objectives 2c)*
- Impose restrictions on high particulate and sulfur burning fuels. *(Objectives 2a, 2b)*
- Provide incentives for compliance with and enforcement of existing housing and building code, especially in high-risk housing. *(Objectives 2a-2d)*

Communities

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Adopt Smart Growth, Complete Streets, Waterfront Revitalization, and related programs. *(Objective 1a, 1b, 1e, 1f, 1g, 1i)*
- Provide targeted education on the impact of the built environment on health (e.g. clinicians, teachers, employers, property owners, local planning and zoning boards). *(Objective 1a-1i)*
- Offer school-, workplace and community-based physical education programs. *(Objective 1b)*
- Construct and maintain safe sidewalks, bike lanes, recreational facilities, parks and other amenities, especially in low income communities. *(Objective 1e, 1f, 1g)*
- Increase public lands designated for public recreation, particularly in low income communities. *(Objective 1e, 1f, 1g)*

Goal #2: Improve home environment.

- Provide home and building modifications, e.g., weatherization, CO alarms, smoke detectors, safety. *(Objectives 2a-2d)*
- Ensure clean energy sources in homes, schools and other buildings, e.g., low sulfur heating oil. *Objectives 2a, 2b)*

Philanthropy

Goal #1: Promote healthy lifestyles, sustainability and adaptation to climate change.

- Make this a funding priority. *(Objective 1a-1i)*
- Fund demonstration programs. *(Objective 1a-1i)*

Goal #2: Improve home environment.

- Make this a funding priority. *(Objectives 2a-2d)*
- Fund demonstration programs. *(Objectives 2a-2d)*
- Increase funding for Healthy Neighborhood and other related programs to conduct home assessments, provide free or low cost safety measures, e.g., CO alarms, smoke detectors) and remediation (e.g., water infiltration. *(Objectives 2a-2d)*

New York State Prevention Agenda
Promote a Healthy and Safe Environment Action Plan
Focus Area 4: Injuries, Violence and Occupational Health

Defining the Problem

Injuries are a leading cause of death and disability in New York State and are the leading cause of death between ages one and 44.⁵¹ Almost 7,500 (21 daily) New Yorkers die every year, as a result of an injury.⁵² Non-fatal injuries also result in adverse health outcomes ranging from temporary pain to long-term disability, chronic pain, and diminished quality of life. Hospitalization and rehabilitation services are also often needed. Injuries are consistently among the leading cause of hospitalization for New Yorkers of all ages. About 160,000 individuals annually (440 daily) are injured severely enough to require hospitalization.⁵³ Another 1.6 million injured New Yorkers each year (4,374 daily) are treated and released from an emergency department.⁵²

In New York State, falls are the leading cause of unintentional injury and deaths, among people ages 65 years and over. Also, it is the leading cause of nonfatal injuries, in this age group and among children up to age four years.⁵⁰ Among young children, the primary location of falls is the home, primarily falls from beds or slips and trips.⁵² More than one in three people over 65 years of age fall each year.⁵⁴ The annual cost for falls account for \$2 billion in hospitalization and \$624.4 million outpatient emergency department.⁵² Approximately, 95% of hospitalization charges, to older adults, are billed to publicly funded programs, i.e., Medicaid and Medicare.⁵² Half of all 65-year old (or older) hospitalized adults are the result of falls. They will end up in a nursing home or rehabilitation center.⁵² The US Preventive Services Task Force recommends, for best prevention actions, the addressing muscle weakness, gait, and balance problems. Recommended treatments include Vitamin D supplements, exercise and physical therapy.⁵⁵

Between 2007 and 2009, homicides and assaults accounted for 832 deaths², 9,273 hospitalizations, and 85,337 emergency department visits in New York State.⁵² Those at highest risk are males between the ages of 15 and 24 years of age (SPARCS 2007-2009).⁵² These hospitalizations cost almost \$240 million and the emergency department visits cost approximately \$134 million, annually.⁵² This does not include societal costs, such as potential life lost, emergency and protective services.

Each year in the United States, more than 4,000 occupational fatalities, three million occupational injuries, and 160,000 cases of occupational illnesses occur.⁵⁶ Efforts to incorporate patients' occupational information into electronic health records would lead to more informed clinical diagnosis and treatment plans, as well as more effective policies, intervention, and prevention strategies to improve the overall health of the working population. It would also reduce the reporting burden for hospitals and health care providers associated with Part 22 of the State Sanitary Code. Research also has shown associations between many chronic diseases and occupation. Electronic health records also will facilitate the exploration of these data for research purposes to identify appropriate interventions.

Climate change also has the potential to impact workers' health. Workers are exposed to a variety of hazards from the natural environment including extreme temperatures, solar ultra-violet radiation, and vector-borne diseases. Work conditions may contribute to the effect of these hazards due to long hours, insufficient breaks and nourishment, and the under use of protective clothing and measures to adapt to changing environmental

conditions. Recently, California and Washington passed regulations requiring employers to take steps to prevent heat illness at all outdoor worksites.⁵⁷ New York State should explore similar regulations for climate-related health issues such as heat and cold stress. Likewise, employers and employees should engage in protective activities towards biological hazards such as poisonous plants and vector-borne diseases such as West Nile Virus and Lyme Disease.

Studies indicate that 80 percent of teens in the United States have worked by the time they finish high school, and each year, about 53,000 youth are injured on the job seriously enough to seek emergency room treatment. In fact, teens are injured at a higher rate than adult workers. Health and safety education is an important component of injury prevention for working teens. While workplace-specific training is most critical, young people also need to learn and practice general health and safety skills that they will carry with them from job to job. Teens should be able to recognize hazards in any workplace. They should understand how hazards can be controlled, what to do in an emergency, what rights they have on the job, and how to speak up effectively when problems arise at work.⁵⁸

Workers experiencing symptoms from influenza-like illness increase the risk of spreading disease to vulnerable populations such as students, patients and elderly, and their families. Their high absenteeism rates also reduce the capability of the healthcare workforce and may have an economic impact. Research needs to be conducted to identify methods to reduce transmission within a built environment. Healthcare workers face a high risk of infection because of contact with patients, and could potentially put other patients at risk; likewise, school personnel also face a high risk of infection from children spreading infections from themselves or family members. Recent research has shown that health care workers and other hospital employees may unnecessarily be exposed to influenza and other infectious diseases due to unawareness and shortfalls of respiratory protection policies, practices, as well as inadequacies in education and training.⁵⁹ Influenza vaccination, the most effective way to prevent influenza among health-care providers according to the Advisory Committee on Immunization Practices,⁶⁰ continues to fall far short of the Health People 2020 goal of 90 percent coverage.

Goals and Objectives for Action

The Injury and Occupational Health Focus Area Committee identified the following goals and objectives for action as well as sector level interventions to implement the identified goals and objectives:

Goal #1: Reduce fall risks among the most vulnerable populations

Objective 1a: Stop the annual increase in the rate of deaths due to falls among residents ages 65 and over by maintaining the rate at 3.5 per 10,000 residents.

Objective 1b: Stop the annual increase of the rate of hospitalizations due to falls among residents ages 65 and over by maintaining the rate at 204.6 per 10,000 residents.*

Objective 1c: Stop the annual increase in the rate of ED visits due to falls among residents ages 65 and over by maintaining the rate at 348.2 per 10,000 residents.

Objective 1d: Reduce hospitalizations rates due to falls among children under 1 year of age from 17.5 to 15.8 per 10,000.

Objective 1e: Reduce hospitalization rates due to falls among children ages 1 to 4 from 10.1 to 9.1 per 10,000.

Objective 1f: Reduce ED visits due to falls among children under 1 year of age from 306.4 to 275.7 per 10,000 residents.

Objective 1g: Reduce ED visits due to falls among children ages 1 to 4 from 476.8 to 429.1 per 10,000 residents.*

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations

Objective 2a: Reduce rate of homicide deaths from 0.43 to 0.39 per 10,000.

Objective 2b: Reduce the rate of assault-related hospitalizations from 4.8 to 4.3 per 10,000.*

Reduce disparity (Ratio=1 means no disparity) by 10%:

- Ratio of Black non-Hispanic rate of assault-related hospitalizations to White non-Hispanic rate of assault-related hospitalizations (Target: 6.69; Baseline: 7.43; Year: 2008-2010; Source: NYS SPARCS Data; Data Availability: State, county)
- Ratio of Hispanic rate of assault-related hospitalizations to White non-Hispanic rate of assault-related hospitalizations (Target: 2.75; Baseline: 3.06; Year: 2008-2010; Source: NYS SPARCS Data; Data Availability: State, county)
- Ratio of assault-related hospitalization rate in low income ZIP codes to assault-related hospitalization rate in non-low income ZIP codes (Target: 2.92; Baseline: 3.25; Year: 2008-2010; Source: NYS SPARCS Data; Data Availability: State, county)

Objective 2c: Reduce the rate of ED visits due to assault from 47.0 to 42.3 per 10,000.

Goal #3: Reduce occupational injury and illness

Objective 3a: Increase the number of NYSDOH databases computerizing industry and occupation variables from 3 to 15.

Objective 3b: Reduce the impact of climate change on outdoor workers.

Objective 3c: Reduce the rate of occupational injuries treated in emergency departments among working adolescents 16-19 years of age from 1.5 per 100 full-time equivalent workers to 1.35.

Objective 3d: Reduce the rate of emergency room visits for occupational injuries among adolescents 15-19 years of age from 36.7 to 33.0 per 10,000.*

Objective 3e: Increase the percent of hospitals with comprehensive respiratory protection policies from 39.1% to 54.7%.

Objective 3f: Increase the percent of health care workers vaccinated for the flu from 75.6% to 90.0%.

Objective 3g: Increase the percent of workers who come in contact with the public who are vaccinated for the flu.

**Objectives that are bolded are a Tracking Indicator.*

Goal #1: Reduce fall risks among vulnerable populations.

Levels of Health Impact Pyramid ^a	Interventions ^b
Counseling and Education	<ul style="list-style-type: none"> • Train community workers in evidence-based intervention programs for older adults such as Tai Chi: Moving for Better Balance and Stepping On and A Matter of Balance. • Train physical therapists to deliver the Otago Exercise Program or other equivalent programs. • Create Statewide fall prevention awareness campaign. • Train podiatrists/primary care providers in appropriate footwear.
Clinical Interventions	<ul style="list-style-type: none"> • Promote the use of evidence-based intervention programs for health care providers such as the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) toolkit. • Careful assessment for fall risks and fall prevention education and referrals for older adults, such as using “Timed Up and Go”. • Integrate exercise and fall prevention into physical therapy. • Educate parents about falls risks among infants and toddlers.
Long-Lasting Protective Interventions	<ul style="list-style-type: none"> • Conduct in-home assessments and interventions to reduce slips and falls among all populations. • Reduce slip and fall hazards in common areas of residences and public buildings. • Improve safety of playground equipment using playground safety regulations. • Assess and change building codes to include elimination of fall risks. • Promote community-based programs for fall prevention.
Changing the Context to Make Individuals’ Decisions Healthy	<ul style="list-style-type: none"> • Improve walkability and safety in community and public spaces [see built environment and air-quality priority areas]. • Expand access to and availability of exercise and information programs in community venues. • Increase access to public transportation through subsidy [also see built environment and air quality priority areas].
Socioeconomic Factors	<ul style="list-style-type: none"> • Target fall risk in housing in disadvantaged areas. • Increase Medicare, Social Security and other benefits to cover fall prevention assessments and interventions, e.g. visual and hearing aids, lighting, non-slip flooring.

^aFrieden T. “A Framework for Public Health Action: The Health Impact Pyramid”. *American Journal of Public Health*. 2010; 100(4): 590-595

^bInterventions in boldface type have been proposed for prioritization

Goal #2: Reduce violence by targeting prevention programs particularly to highest risk populations.

Levels of Health Impact Pyramid ^a	Interventions ^b
<i>Counseling and Education</i>	<ul style="list-style-type: none"> • Train residents, community-based organizations and other organizations in crisis management and dispute mediation. • Increase school based and community programs in conflict resolution. • Raise community awareness of violence prevention strategies
<i>Clinical Interventions</i>	<ul style="list-style-type: none"> • Provide referrals in emergency departments and hospitals for victims of violence similar to the Strong Memorial Hospital Youth Violence Intervention Program (Rochester, NY). • Provide on-going mental health and substance abuse treatment to at-risk youth and their families. • Link violence victims and their families to educational opportunities, employment training and assistance, mental health services, substance abuse treatment, etc. as in the CEASEFIRE program. • Create standards of care/discharge planning in hospitals.
<i>Long-Lasting Protective Interventions</i>	<ul style="list-style-type: none"> • Develop multi-sector violence prevention programs (e.g., LHDs, criminal justice, social services, job training, CBOs) such as SNUG, Cure Violence or CEASEFIRE in high-risk communities. • Provide outreach workers and violence interrupters in schools and communities, especially during critical times. • Increase safety protections for at risk workers, (e.g. handle cash, work at night).
<i>Changing the Context to Make Individuals' Decisions Healthy</i>	<ul style="list-style-type: none"> • Improve safety in school and workplace environments with cameras, better lighting, safes, more than one person on duty. • Reduce neighborhood environmental risks, e.g., abandoned buildings, no lighting, deserted street. • Reduce access to firearms by strengthening laws and permit requirements. • Increase availability of health and mental health care services.
<i>Socioeconomic Factors</i>	<ul style="list-style-type: none"> • Increase educational, recreational and employment opportunities for at risk youth potentially through summer work experience programs or youth apprenticeship initiatives. • Increase other community amenities, e.g., low cost healthy food, parks.

^aFrieden T. "A Framework for Public Health Action: The Health Impact Pyramid". *American Journal of Public Health*. 2010; 100(4): 590-595

^bInterventions in boldface type have been proposed for prioritization

Goal #3: Reduce occupational injuries and illnesses

Levels of Health Impact Pyramid ^a	Interventions ^b
<i>Counseling and Education</i>	<ul style="list-style-type: none"> • Train providers in taking occupational history. • Develop targeted occupational safety and health training programs for employers and workers in high-risk jobs. • Train providers in recognizing signs and symptoms associated with weather-related outcomes, such as heat and cold stress and arboviral infections. • Develop targeted occupational health and safety training programs for employers and workers in high-risk jobs. • Educate teens about their rights and applicable regulations using curricula such as “Talking Safety” or the “Passport to Safety”, targeting vocational schools and industries hiring large numbers of young workers. • Develop respiratory protection programs that include written policies and procedures for fit testing, employee training, medical clearance, appropriate selection of respirators, training in the use and maintenance of respirators, recordkeeping and program evaluation. • Concerted outreach and media campaigns directed at targeted occupational groups • Outreach effort targeting vocational school programs and industries hiring large numbers of young workers.
<i>Clinical Interventions</i>	<ul style="list-style-type: none"> • Collect occupational history in routine and emergency medical care. • Routinize collection of industry and occupation information in electronic health records and other medical data. • Strengthen rehabilitation services for injured and ill workers. • Improve diagnosis and treatment of weather-related outcomes, such as heat and cold stress and arboviral infections. • Recognize risks based on developmental age prior to approving work permits. • Recognize risks based on job duties for transmitting viruses.
<i>Long-Lasting Protective Interventions</i>	<ul style="list-style-type: none"> • Develop targeted occupational safety and health inspections and safety programs for high-risk jobs. • Provide technical assistance and resources to employers in improving safety of workplace design and equipment. • Capture industry and occupation on medical records and in other health reporting. • Consider requiring flu vaccine for workers who interact with high-risk populations.
<i>Changing the Context to Make Individuals’ Decisions Healthy</i>	<ul style="list-style-type: none"> • Remove disincentives to reporting occupational hazards, injuries and illnesses. • Increase resources for occupational safety and health safety inspections and programs. • Strengthen occupational safety and health laws to provide disincentives for harming workers.

**Socioeconomic
Factors**

- Continue to reform workers' compensation laws and policies to ensure adequate benefits and reduce barriers to access and payment.
- Increase compliance with OSHA, wage, benefit and other worker protections such as not reporting work-related injuries.
- Strengthen work permits laws and use.
- Supply sick leave or other strategies for workers who have the potential to infect vulnerable populations.

^aFrieden T. "A Framework for Public Health Action: The Health Impact Pyramid". *American Journal of Public Health*. 2010; 100(4): 590-595

^bInterventions in boldface type have been proposed for prioritization

Interventions by Sector

Change can be made across the sectors identified below to improve health outcomes related to injuries and occupational health. Below are examples of how your sector can make a difference.

Healthcare Delivery System

Goal #1: Reduce fall risks among the most vulnerable populations.

- Train community workers in evidence-based intervention programs for older adults such as Tai Chi: Moving for Better Balance, Stepping On, A Matter of Balance, Otago Exercise Program, and other equivalent programs. *(Objectives 1a-1c)*
- Provide screening for older adults using Timed Up and Go and Risk Assessment questionnaires. *(Objectives 1a-1c)*
- Provide referrals to physical and occupational therapy. *(Objectives 1a-1c)*
- Integrate exercise and fall prevention into physical therapy. *(Objectives 1a-1c)*
- Train podiatrists/PCPs in appropriate footwear. *(Objectives 1a-1c)*
- Promote the use of evidence-based intervention programs for health care providers such as the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) toolkit. *(Objectives 1a-1c)*
- Educate parents about falls risks among infants and toddlers. *(Objectives 1d-1g)*

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Provide referrals in EDs and hospitals for victims of violence similar to the Strong Memorial Hospital Youth Violence Intervention Program (Rochester, NY). *(Objectives 2a-2c)*
- Provide on-going mental health and substance abuse treatment to at-risk youth and their families. *(Objectives 2a-2c)*
- Create standards of care/discharge planning in hospitals. *(Objectives 2a-2c)*
- Increase availability of health and mental health care services. *(Objectives 2a-2c)*

Goal #3: Reduce occupational injury and illness.

- Incorporate industry and occupation into electronic health records and other health reporting. *(Objective 3a, 3c, 3d)*
- Implement appropriate policies to reduce transmission. *(Objective 3e, 3f)*
- Inform personnel of respiratory protection programs. *(Objective 3e, 3f)*
- Ensure appropriate adherence to policies and procedures for workplace safety. *(Objective 3b, 3c, 3d)*
- Recognize risks based on developmental age prior to approving work permits. *(Objective 3b, 3c, 3d)*
- Improve awareness of signs and symptoms and treatment to aid in appropriate rapid response. *(Objective 3b)*
- Train providers in recognizing signs and symptoms associated with weather-related outcomes, such as heat and cold stress and arboviral infections. *(Objective 3b)*
- Routinize collection of industry and occupation in EHR and other medical data. *(Objective 3a, 3c, 3d)*
- Strengthen rehab services for injured and ill workers. *(Objective 3c, 3d)*

- Improve worker diagnosis and treatment of weather-related outcomes, such as heat and cold stress and arboviral infections. *(Objective 3b)*
- Conduct annual comprehensive educational campaigns targeting health care workers to encourage influenza vaccination. *(Objective 3f)*
- Provide vaccination free of charge to health care workers on all shifts. *(Objective 3f)*
- Consider requiring flu vaccine for health care workers who interact with high-risk populations. *(Objectives 3f)*

Employers, Businesses, and Unions

Goal #1: Reduce fall risks among the most vulnerable populations.

- Provide training and appropriate footwear for older employees. *(Objectives 1a-1c)*
- Raise awareness and reduce risk of slip and trip hazards for workers and any public that interact with their establishments. *(Objectives 1a-1g)*

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Reduce risks for workplace violence. *(Objectives 2a-2c)*
- Increase educational, recreational and employment opportunities for at risk youth potentially through summer work experience programs or youth apprenticeship initiatives. *(Objectives 2a-2c)*
- Improve safety in school and workplace environments with cameras, better lighting, safes, more than one person on duty. *(Objectives 2a-2c)*
- Increase safety protections for at risk workers, e.g., handle cash, work at night. *(Objectives 2a-2c)*

Goal #3: Reduce occupational injury and illness.

- Institute appropriate control mechanisms to reduce exposures. *(Objectives 3b, 3c, 3d)*
- Provide programs specific to the workplace. *(Objectives 3b-3g)*
- Recognize the value of keeping the workforce healthy. *(Objectives 3b-3g)*
- Recognize the value of training in workplace safety and health to teens by hiring appropriately trained teens. *(Objectives 3b, 3c, 3d)*
- Provide water, shade, and other appropriate controls at reasonable intervals. *(Objectives 3b, 3c, 3d)*
- Raise awareness among their employees about the hazards and the need to reduce their exposures. *(Objectives 3b-3g)*
- Conduct research to review links between occupation and industry and chronic and infectious diseases. *(Objectives 3b, 3e, 3f, 3g)*
- Educate teens about their rights and applicable regulations using curricula such as “Talking Safety” or the “Passport to Safety”, targeting vocational schools and industries hiring large numbers of young workers. *(Objectives 3b, 3c, 3d)*
- Develop respiratory protection programs which include written policies and procedures for fit testing, employee training, medical clearance, appropriate selection of respirators, training in the use and maintenance of respirators, recordkeeping and program evaluation. *(Objectives 3e)*
- Recognize risks based on developmental age prior to approving work permits. *(Objectives 3c, 3d)*
- Recognize risks based on job duties for transmitting viruses. *(Objectives 3e, 3g)*

- Conduct annual comprehensive educational campaigns targeting workers to encourage influenza vaccination. *(Objective 3g)*
- Develop targeted occupational safety and health inspections and safety programs for high-risk jobs. *(Objectives 3b-3g)*
- Supply sick leave or other strategies for workers who have the potential to infect vulnerable populations. *(Objectives 3e, 3g)*
- Increase compliance with OSHA, wage, benefit and other worker protections. *(Objectives 3b-3g)*

Media

Goal #1: Reduce fall risks among the most vulnerable populations.

- Promote independence among older adults through exercise. *(Objectives 1a-1c)*
- Promote classes and activities that reduce fall risks. *(Objectives 1a-1c)*
- Educate parents about falls risks for infants and toddlers. *(Objectives 1d-1g)*
- Disseminate Statewide fall prevention awareness campaign. *(Objectives 1a-1g)*
- Conduct outreach and media campaigns directed at targeted occupational groups. *(Objectives 1a-1c)*
- Expand access to and availability of exercise and information programs in community venues. *(Objectives 1a-1c)*
- Raise awareness of programs, problems and solutions. *(Objectives 1a-1g)*

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Raise community awareness of multi-sectoral violence prevention programs, e.g. LHDs, criminal justice, social services, job training, CBOs, such as SNUG, Cure Violence or CEASEFIRE in high-risk communities. *(Objectives 2a-2c)*

Goal #3: Reduce occupational injury and illness.

- Raise awareness of workplace hazards and methods to reduce or prevent these risks. *(Objectives 3b-3f)*
- Conduct a media and social marketing campaign to increase broad community awareness of the threat of extreme weather conditions, prevention measures needed to avoid it and the roles various players could take. *(Objectives 3b)*

Academia

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Increase school based and community programs in conflict resolution. *(Objectives 2a-2c)*
- Improve safety in school and workplace environments with cameras, better lighting, safes, more than one person on duty. *(Objectives 2a-2c)*

Goal #3: Reduce occupational injury and illness.

- Conduct research to review links between occupation and industry and chronic and infectious diseases. *(Objectives 3b, 3e, 3f)*
- Measure absenteeism, due to flu illness among employees and students. *(Objectives 3e)*
- Promote appropriate behavior patterns to reduce risks. *(Objectives 3b-3f)*
- Provide workplace safety and health information in all vocational school curricula. *(Objectives 3c, 3d)*

- Provide basic information about worker safety and health issues to all students as part of their health programs. *(Objectives 3c, 3d)*
- Include information about hazards in all vocational training programs geared towards outdoor work. *(Objectives 3b, 3c, 3d)*
- Educate teens about their rights and applicable regulations using curricula such as “Talking Safety” or the “Passport to Safety”, targeting vocational schools and industries hiring large numbers of young workers. *(Objectives 3c, 3d)*

Community-Based Organizations

Goal #1: Reduce fall risks among the most vulnerable populations.

- Train physical therapists to deliver the Otago Exercise Program or other equivalent programs. *(Objectives 1a-1c)*
- Conduct in-house falls risk assessments. *(Objectives 1a-1g)*
- Provide access to exercise programs. *(Objectives 1a-1c)*
- Train community workers in exercise programs for older adults. *(Objectives 1a-1c)*
- Educate parents about falls risks among infants and toddlers. *(Objectives 1d-1g)*
- Promote community-based programs for fall prevention. *(Objectives 1a-1g)*
- Expand access to and availability of exercise and information programs in community venues. *(Objectives 1a-1g)*
- Target fall risk in housing in disadvantaged areas. *(Objectives 1a-1g)*

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Raise community awareness of causes and local efforts to prevent violence. *(Objectives 2a-2c)*
- Implement evidence-based interventions to address the causes of violence. *(Objectives 2a-2c)*
- Provide on-going mental health and substance abuse treatment to at-risk youth and their families. *(Objectives 2a-2c)*
- Link violence victims and their families to educational opportunities, employment training and assistance, mental health services, substance abuse treatment, etc. as in the CEASEFIRE program. *(Objectives 2a-2c)*

Goal #3: Reduce occupational injury and illness.

- Incorporate occupation and industry into all patient-oriented databases. *(Objective 3a)*
- Institute appropriate behavior patterns to reduce transmission of infections. *(Objectives 3b, 3e, 3f)*

Other Governmental Agencies

Goal #1: Reduce fall risks among the most vulnerable populations.

- Increase awareness of exercise as method to maintain independence for older adults. *(Objectives 1a-1c)*
- Provide access to exercise programs. *(Objectives 1a-1c)*
- Reduce slip and fall hazards in common areas of residences and public buildings. *(Objectives 1a-1c)*
- Improve safety of playground equipment using playground safety regulations. *(Objectives 1d-1g)*

- Assess and change building codes to include elimination of fall risks. *(Objectives 1a-1c)*
- Increase access to public transportation through subsidy. *(Objectives 1a-1c)*
- Target fall risk in housing in disadvantaged areas. *(Objectives 1a-1g)*

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Partner with identifying high-risk communities and individuals. *(Objectives 2a-2c)*
- Provide appropriate educational interventions. *(Objectives 2a-2c)*
- Provide support to at-risk individuals and their families to reduce the risks for violence. *(Objectives 2a-2c)*
- Increase school based and community programs in conflict resolution. *(Objectives 2a-2c)*
- Develop multi-sectoral violence prevention programs, e.g., LHDs, criminal justice, social services, job training, CBOs, such as SNUG, Cure Violence or CEASEFIRE in high-risk communities. *(Objectives 2a-2c)*
- Improve safety in school and workplace environments with cameras, better lighting, safes, more than one person on duty.
- Reduce neighborhood environmental risks (e.g., abandoned buildings, no lighting, deserted streets). *(Objectives 2a-2c)*
- Increase other community amenities, e.g., low cost healthy food, parks. *(Objectives 2a-2c)*

Goal #3: Reduce occupational injury and illness.

- Use federal and State DOL to reach employers about effective methods to protect their workers. *(Objectives 3b-3f)*
- Require training for those participating in DOL summer work programs and for those obtaining working papers. *(Objective 3c, 3d)*
- Conduct research to review links between occupation and industry and chronic and infectious diseases. *(Objectives 3b, 3e, 3f)*
- Train providers in taking occupational history. *(Objectives 3a-3f)*
- Develop respiratory protection programs which include written policies and procedures for fit testing, employee training, medical clearance, appropriate selection of respirators, training in the use and maintenance of respirators, recordkeeping and program evaluation. *(Objectives 3e)*
- Develop targeted occupational safety and health inspections and safety programs for high-risk jobs. *(Objectives 3b-3f)*
- Provide technical assistance and resources to employers in improving safety of workplace design and equipment. *(Objectives 3b, 3c, 3d)*
- Remove disincentives to reporting occupational hazards, injuries and illnesses. *(Objectives 3a, 3c, 3d)*
- Strengthen occupational safety and health safety inspections and programs. *(Objectives 3a-3f)*
- Strengthen occupational safety and health laws to provide disincentives for harming workers. *(Objectives 3a, 3c, 3d)*
- Continue to reform workers' compensation laws and policies to ensure adequate benefits and reduce barriers. *(Objectives 3a)*
- Increase compliance with OSHA, wage, benefit and other worker protections. *(Objectives 3a)*

- Strengthen work permits laws and use. *(Objectives 3b-3f)*

Governmental (G) and Non-Governmental (NG) Public Health

Goal #1: Reduce fall risks among the most vulnerable populations.

- Coordinate resources focused on fall prevention. (G) (NG) *(Objectives 1a-1g)*
- Increase awareness of exercise as method to maintain independence. (G) (NG) *(Objectives 1a-1c)*
- Provide access to exercise programs. (G) (NG) *(Objectives 1a-1c)*
- Conduct outreach and media campaigns directed at targeted occupational groups. (G) (NG) *(Objectives 1a-1c)*
- Educate parents about falls risks among infants and toddlers. (G) (NG) *(Objectives 1d-1g)*
- Promote community-based programs for fall prevention. (G) (NG) *(Objectives 1a-1g)*
- Target fall risk in housing in disadvantaged areas. (G) (NG) *(Objectives 1a-1g)*
- Increase Medicare, Social Security and other benefits to cover fall prevention assessments and interventions, e.g., visual and hearing aids, lighting, non-slip flooring. (G) *(Objectives 1a-1g)*

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Provide training and resources to local health departments. (G) (NG) *(Objectives 2a-2c)*
- Partner with identifying high-risk communities and individuals. (G) (NG) *(Objectives 2a-2c)*
- Provide appropriate educational interventions. (G) (NG) *(Objectives 2a-2c)*
- Provide support to at-risk individuals and their families to reduce the risks for violence. (G) (NG) *(Objectives 2a-2c)*
- Train residents, CBOs and other organizations in crisis management and dispute mediation. (G) (NG) *(Objectives 2a-2c)*
- Link violence victims and their families to educational opportunities, employment training and assistance, mental health services, substance abuse treatment, etc. as in the CEASEFIRE program. (G) (NG) *(Objectives 2a-2c)*
- Identify high-risk communities for development of multi-sectoral violence prevention programs (e.g. LHDs, criminal justice, social services, job training, CBOs) such as SNUG, Cure Violence or CEASEFIRE in high-risk communities. (G) (NG) *(Objectives 2a-2c)*
- Provide outreach workers and violence interrupters in schools and communities, especially during critical times. (G) (NG) *(Objectives 2a-2c)*
- Increase educational, recreational and employment opportunities for at risk youth potentially through summer work experience programs or youth apprenticeship initiatives. (G) (NG) *(Objectives 2a-2c)*
- Increase availability of health and mental health care services. (G) (NG) *(Objectives 2a-2c)*

Goal #3: Reduce occupational injury and illness.

- Research links between diseases that are 'occupational and industrial' and 'chronic and infectious' origin. (G) (NG) *(Objectives 3b, 3e, 3f)*
- Incorporate occupation and industry into all DOH databases. (G) *(Objectives 3a)*
- Provide methods to link electronic reporting records with occupational health registries. (G) (NG) *(Objectives 3a, 3c, 3d)*

- Raise awareness and possibly pass legislation requiring appropriate employer action in times of extreme weather events. (G) (*Objectives 3b*)
- Develop targeted occupational safety and health training programs for employers and workers in high-risk jobs. (G) (NG) (*Objectives 3b*)
- Train providers in recognizing signs and symptoms associated with weather-related outcomes, such as heat and cold stress and arboviral infections. (G) (NG) (*Objectives 3b*)
- Provide technical assistance and resources to employers in improving safety of workplace design and equipment. (G) (NG) (*Objectives 3b, 3c, 3d*)
- Consider requiring flu vaccine for workers who interact with high-risk populations. (G) (*Objectives 3f, 3g*)
- Conduct annual comprehensive educational campaigns targeting workers to encourage influenza vaccination. (*Objective 3f, 3g*)

Policymakers and Elected Officials

Goal #1: Reduce fall risks among the most vulnerable populations.

- Improve walkability and safety in community and public spaces. (*Objectives 1a-1c*)
- Assess and change building codes to include elimination of fall risks. (*Objectives 1a-1c*)

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Reduce access to firearms for children and individuals at high-risk for violence. (*Objectives 2a-2c*)

Goal #3: Reduce occupational injury and illness.

- Raise awareness and possibly pass legislation requiring appropriate employer action in times of extreme weather events. (*Objectives 3b*)
- Continue to reform workers' compensation laws and policies to ensure adequate benefits and reduce barriers to access and payment. (*Objectives 3a*)
- Increase compliance with OSHA, wage, benefit and other worker protections such as not reporting work-related injuries. (*Objectives 3a*)
- Strengthen work permits laws and use. (*Objectives 3c, 3d*)
- Consider legislation requiring health care and school personnel to be vaccinated for the flu. (G) (*Objectives 3f, 3g*)
- Consider legislation requiring students to be trained about worker health and safety issues as part of the school curricula. (G) (*Objectives 3c, 3d*)

Communities

Goal #1: Reduce fall risks among the most vulnerable populations.

- Provide safe walking environments. (*Objectives 1a-1c*)
- Reduce slip and fall hazards in common areas of residences and public buildings. (*Objectives 1a-1c*)
- Improve safety of playground equipment using playground safety regulations. (*Objectives 1a-1c*)

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Reach high-risk individuals and offer solutions. (*Objectives 2a-2c*)
- Create healthier environments. (*Objectives 2a-2c*)

- Raise community awareness of violence prevention strategies. (*Objectives 2a-2c*)
- Improve school-based, layperson and provider awareness in suicide prevention. (*Objectives 2a-2c*)
- Increase educational, recreational and employment opportunities for at risk youth potentially through summer work experience programs or youth apprenticeship initiatives. (*Objectives 2a-2c*)

Goal #3: Reduce occupational injury and illness.

- Provide information to hard to reach populations. (*Objectives 3b, 3c, 3d*)

Philanthropy

Goal #2: Reduce violence by targeting prevention programs particularly to highest-risk populations.

- Offer assistance to high-risk individuals and their families. (*Objectives 2a-2c*)

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