

## V. Measures and Data Sources for Environmental Public Health Indicators

### Air, Ambient (Outdoor)

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazards</b>		
Criteria pollutants in ambient air ( <i>core</i> )	1) Annual high levels of criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO <sub>2</sub> ), ozone (O <sub>3</sub> ), PM <sub>10</sub> , sulfur dioxide (SO <sub>2</sub> ) ( <i>core</i> ) 2) Tons of criteria pollutants released in ambient air ( <i>core</i> )	<b>EPA:</b> National Air Quality and Emissions Trends Report; NMMAPS; NEI; Urban Air Toxics Program; TRI/EPCRA; AIRS <b>States or local jurisdictions:</b> environmental protection agencies, especially those with indicator projects; Urban Air Toxics Programs
Hazardous or toxic substances in ambient air ( <i>core</i> )	1) Tons of one or more hazardous or toxic substances released in ambient air ( <i>core</i> ) 2) Number of reports of noncompliance for emissions releases ( <i>developmental</i> )	<b>ATSDR:</b> HSEES <b>EPA:</b> National Air Quality and Emissions Trends Report; NMMAPS; NEI; TRI/EPCRA; AIRS <b>NOAA (NWS)</b> <b>States or local jurisdictions:</b> environmental protection agencies, especially those with indicator projects; Urban Air Toxics Programs
Motor vehicle emissions ( <i>core</i> )	1) Vehicle miles driven per capita ( <i>core</i> ) 2) Average fuel efficiency of registered motor vehicles ( <i>optional</i> )	<b>CB:</b> census data <b>DOE (EIA)</b> <b>DOT, FHA:</b> NPTS
Residence in non-attainment areas ( <i>core</i> )	1) Percentage of human population residing in non-attainment areas (for criteria air pollutants) ( <i>core</i> )	<b>CB:</b> census data <b>EPA:</b> National Air Quality and Emissions Trends Report, NMMAPS
<b>Exposures</b>		
(None identified)		
<b>Health Effects</b>		
Unusual pattern of asthma events ( <i>core</i> )	1) Number of asthma-related deaths ( <i>core</i> ) 2) Incidence of asthma ( <i>core</i> ) 3) Rates of hospitalization and emergency department visits for acute asthma events ( <i>core</i> ) 4) Number of work days missed because of asthma ( <i>optional</i> ) 5) Number of school days missed because of asthma ( <i>optional</i> ) 6) Proportion of population filling prescriptions for asthma medication ( <i>developmental</i> )	<b>CDC:</b> NHAMCS, NHDS, NVSS <b>States or local jurisdictions:</b> CDI surveillance; ME/Cs; vital statistics
Unusual pattern of cardiovascular or respiratory events ( <i>core</i> )	1) Incidence of cardiovascular and respiratory events ( <i>core</i> ) 2) Rates of hospitalization and emergency department visits for acute cardiovascular and respiratory events ( <i>core</i> )	<b>CDC:</b> NHAMCS, NHDS, NVSS <b>States or local jurisdictions:</b> CDI surveillance; vital statistics

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<b>Interventions</b>		
<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
Programs that address motor vehicle emissions ( <i>core</i> )	1) Proportion of population residing in jurisdictions that have vehicle emissions mandates ( <i>core</i> ) 2) Number of public education messages to encourage the use of personal transportation alternatives (e.g., “ozone action day”) ( <i>optional</i> )	<b>CB:</b> census data <b>DOT (FHA):</b> NPTS <b>States or local jurisdictions:</b> environmental protection and transportation agencies, especially those with indicator projects
Alternate fuel use in registered motor vehicles ( <i>core</i> )	1) Proportion of registered vehicles powered by alternative fuel ( <i>core</i> )	<b>DOE (EIA)</b> <b>States or local jurisdictions:</b> transportation agencies
Availability of mass transit ( <i>core</i> )	1) Proportion of population for whom mass transit is available ( <i>core</i> ) 2) Proportion of population who chose personal transportation alternatives (e.g., walking, bicycling) ( <i>optional</i> )	<b>CB:</b> census data <b>CDC:</b> BRFSS; NHIS <b>DOT (FHA):</b> National Bicycle and Walking Study; NPTS <b>States or local jurisdictions:</b> CDI surveillance; transportation agencies
Programs that address hazardous or toxic substances in ambient air ( <i>optional</i> )	1) Number of jurisdictions that have air toxics monitoring programs ( <i>optional</i> ) 2) Number of operating permits for releases of hazardous air pollutants ( <i>optional</i> ) 3) Number of fines for hazardous releases violations ( <i>optional</i> )	<b>EPA</b> <b>States or local jurisdictions:</b> environmental protection agencies

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### Air, Indoor

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazards</b>		
Tobacco smoke in homes with children ( <i>core</i> )	1) Proportion of children residing in households with adult smokers ( <i>core</i> ) 2) Proportion of households with adult smokers ( <i>core</i> ) 3) Proportion of children who smoke ( <i>optional</i> )	<b>CB:</b> census data <b>CDC:</b> BRFSS; NHIS; YRBSS <b>EPA</b> <b>American Legacy Foundation</b> <b>States or local jurisdictions:</b> CDI surveillance; environmental protection agencies, especially those with indicator projects
Hazardous or toxic substances in indoor air ( <i>optional</i> )	1) Proportion of houses with group I dust mite in beds ( <i>optional</i> ) 2) Proportion of houses with >0.1 unit/g German cockroach dust in beds ( <i>optional</i> ) 3) Proportion of schools with indoor air hazards ( <i>developmental</i> )	<b>CDC</b> <b>HUD:</b> National Survey of Lead and Allergens in Housing <b>NIEHS</b>
<b>Exposures</b>		
(None identified)		
<b>Health Effects</b>		
CO poisoning (not fire-related) ( <i>core</i> )	1) Number of deaths from CO poisoning ( <i>core</i> ) 2) Number of hospitalizations and emergency department visits attributed to CO exposure ( <i>core</i> )	<b>CDC:</b> NHAMCS; NHDS; NVSS <b>States or local jurisdictions:</b> injury and CDI surveillance; hospital discharge data; ME/Cs; vital statistics
Unusual pattern of respiratory events ( <i>optional</i> )	1) Number of emergency department visits in which an air-borne agent is suspected ( <i>optional</i> ) 2) Number of deaths in which an air-borne agent is suspected ( <i>optional</i> )	<b>CDC:</b> NHAMCS; NHDS; NVSS <b>States or local jurisdictions:</b> CDI surveillance; ME/Cs; vital statistics
<b>Interventions</b>		
Policies that address indoor air hazards in schools ( <i>core</i> )	1) Proportion of schools with indoor air policies ( <i>core</i> ) 2) Proportion of schools with smoke-free and tobacco-free policies ( <i>core</i> )	<b>CDC:</b> NHIS; SHPPS; YRBSS <b>EPA</b> <b>States or local jurisdictions:</b> CDI surveillance; STATE
Laws pertaining to smoke-free indoor air ( <i>core</i> )	1) Number of jurisdictions with laws on smoke-free indoor air ( <i>core</i> ) 2) Proportion of resident population in jurisdictions with laws pertaining to smoke-free indoor air ( <i>core</i> )	<b>CB:</b> census data <b>CDC, NIOSH</b> <b>States or local jurisdictions:</b> STATE; health agencies, occupational safety and health divisions
Indoor air inspections ( <i>core</i> )	1) Number of complaint-related indoor air inspections ( <i>core</i> )	<b>CDC (NIOSH)</b> <b>OSHA</b>
Use of best practices for protecting indoor air ( <i>optional</i> )	1) Number of local jurisdictions with ordinances requiring CO detectors in apartment buildings ( <i>optional</i> ) 2) Proportion of non-manufacturing work force that occupies office buildings for which indoor air quality management practices address human health ( <i>optional</i> ) 3) Proportion of resident population for which programs are available for testing radon in high-risk homes ( <i>optional</i> )	<b>CDC:</b> NHIS, NIOSH surveillance systems <b>EPA</b> <b>OSHA:</b> health agencies, occupational safety and health divisions <b>States or local jurisdictions:</b> health agencies, occupational safety and health divisions; local OSHA; STATE

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### Disasters

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazards</b>		
Residence in a flood plain ( <i>core</i> )	1) Proportion of resident population with homes in a flood plain ( <i>core</i> )	<b>CB:</b> census data <b>FEMA</b> <b>USGS</b>
Geographic or climatic conditions that increase susceptibility to hazards ( <i>optional</i> )	1) Number of days in which temperatures exceed safe thresholds ( <i>optional</i> ) 2) Amount of excessive rainfall ( <i>optional</i> ) 3) Duration of drought conditions ( <i>developmental</i> ) 4) Number of days of flooding ( <i>developmental</i> ) 5) Number of floods in areas with high concentrations of pesticide through production, sales, or use ( <i>developmental</i> )	<b>FEMA</b> <b>NOAA</b> <b>USDA</b> <b>USGS</b> <b>States or local jurisdictions:</b> agriculture and environmental protection agencies, especially those with indicator projects
Residence in a temporary or unsafe structure ( <i>optional</i> )	1) Proportion of population residing in damaged or destroyed home ( <i>optional</i> ) 2) Proportion of population residing in temporary shelter ( <i>optional</i> )	<b>ARC</b> <b>CB:</b> census data <b>CDC</b> <b>FEMA</b> <b>States or local jurisdictions</b>
<b>Exposures</b>		
(None identified)		
<b>Health Effects</b>		
Deaths attributed to extremes in ambient temperature ( <i>core</i> )	1) Number of heat-attributed deaths ( <i>core</i> ) 2) Number of deaths from hypothermia ( <i>optional</i> )	<b>ARC</b> <b>CDC:</b> NHAMCS; NHDS; NVSS <b>EPA:</b> NMMAPS <b>NOAA (NWS, NCDC, NSSL)</b> <b>States or local jurisdictions:</b> ME/Cs; vital statistics
Morbidity and mortality attributed to natural forces ( <i>optional</i> )	1) Number of illnesses or injuries from natural disasters by type of disaster ( <i>optional</i> ) 2) Number of deaths from natural disasters by type of disaster ( <i>optional</i> )	<b>ARC</b> <b>CDC:</b> NHAMCS; NHDS; NVSS <b>EPA:</b> NMMAPS <b>NOAA (NWS, NCDC, NSSL)</b> <b>States or local jurisdictions:</b> ME/Cs; vital statistics
<b>Intervention</b>		
Emergency preparedness, response, and mitigation training programs, plans, and protocols ( <i>core</i> )	1) Proportion of jurisdictions for which multi-institutional exercises to prepare for disaster response are conducted annually ( <i>core</i> ) 2) Proportion of jurisdictions for which there protocols exist for public education messages to elicit preventive behaviors among resident population ( <i>optional</i> ) 3) Proportion of jurisdictions for which early warning systems are in place ( <i>optional</i> ) 4) Proportion of jurisdictions for which sheltering programs exist ( <i>optional</i> ) 5) Proportion of jurisdictions for which safe building codes are enforced ( <i>optional</i> )	<b>CDC (NCEH)</b> <b>FEMA</b> <b>NOAA (NWS, NCDC, NSSL)</b> <b>States or local jurisdictions:</b> health and public safety agencies; local FEMA

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### Lead

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazards</b>		
Lead contamination in the environment ( <i>optional</i> )	1) Proportion of housing stock built before 1950 ( <i>optional</i> ) 2) Lead levels in sediment and in game or commercial fish ( <i>optional</i> )	<b>CB</b> <b>HUD</b> <b>States or local jurisdictions:</b> environmental protection agencies, especially those with indicator projects
Residence near metal processing industries ( <i>developmental</i> )	1) Proportion of population residing near lead smelters ( <i>developmental</i> )	<b>CB</b> <b>HUD</b>
<b>Exposure</b>		
Blood lead level (in children) ( <i>core</i> )	1) Proportion of high-risk children with elevated blood lead level ( <i>core</i> )	<b>CDC:</b> NHANES; Lead Surveillance Program <b>States or local jurisdictions:</b> prevalence surveys
<b>Health Effect</b>		
Lead poisoning (in children) ( <i>core</i> )	1) Number of hospitalizations from lead poisoning in children ( <i>core</i> )	<b>CDC:</b> NHAMCS; NHDS <b>States or local jurisdictions:</b> hospital discharge surveys
<b>Intervention</b>		
Lead elimination programs ( <i>optional</i> )	1) Number of jurisdictions with lead training and certification programs ( <i>optional</i> ) 2) Proportion of population living in pre-1950 housing that has been tested for the presence of lead-based paint ( <i>optional</i> ) 3) Number of completed lead abatements ( <i>developmental</i> )	<b>CB</b> <b>CDC:</b> NHIS <b>EPA</b> <b>HUD</b> <b>States or local jurisdictions</b> <b>Private sector:</b> industry monitoring systems

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### Noise

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazard</b>		
Residence in noisy environments ( <i>optional</i> )	1) Number of noise complaints ( <i>optional</i> ) 2) Level of noise monitored in a community ( <i>optional</i> )	<b>States or local jurisdictions:</b> police, sheriff offices
<b>Exposures</b>		
(None identified)		
<b>Health Effect</b>		
Noise-induced hearing loss (non-occupational) ( <i>core</i> )	1) Proportion of noise-exposed adults with hearing loss ( <i>core</i> ) 2) Proportion of children and adolescents with hearing loss ( <i>optional</i> )	<b>CDC:</b> BRFSS; NHANES; NHIS; YRBS <b>DOD (Recruiting Offices)</b> <b>States or local jurisdictions:</b> prevalence surveys from health agencies, schools
<b>Intervention</b>		
Hearing protection practices ( <i>optional</i> )	1) Proportion of population using appropriate ear protection devices and equipment ( <i>optional</i> ) 2) Number of jurisdictions with noise ordinances and prohibitions on specific activities ( <i>optional</i> )	<b>CDC:</b> NHIS <b>OSHA</b>

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### Pesticides

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazards</b>		
Pesticide use and patterns of use ( <i>core</i> )	1) Annual tons used ( <i>core</i> ) 2) Pounds applied ( <i>core</i> ) 3) Patterns of use in agriculture, home, and garden ( <i>optional</i> ) 4) Number of worker and community complaints about possible pesticide exposure ( <i>developmental</i> )	<b>EPA (OPP, Health Effects Division)</b> <b>USDA (PDP):</b> <b>USGS (NAWQA, NASQAN)</b> <b>States or local jurisdictions:</b> monitoring and reporting systems; environmental protection agencies, especially those with indicator projects; local USGS Offices
Residual pesticide in foods ( <i>core</i> )	1) Proportion of foods with residual pesticide levels that fail to meet safe consumption regulations and guidelines ( <i>core</i> )	<b>EPA</b> <b>USDA (FDA):</b> Total Dietary Survey
<b>Exposure</b>		
Biologic markers of pesticides or pesticide metabolites in human tissue ( <i>optional</i> )	1) 95 <sup>th</sup> percentile blood and urine concentration levels for biomarkers of exposure to carbaryl (1-naphthol), methyl parathion and parathion (paranitrophenol), chlorpyrifos (3,5,6-trichloro-2-pyridinol), propoxur (isopropoxyphenol), 2,4-D, o-phenylphenol, permethrins, diazinon, chlordane, dieldrin, DDT, lindane ( <i>optional</i> ) 2) 95 <sup>th</sup> percentile urine concentration level for six biomarkers of exposure to 28 pesticides: dimethyl phosphate, dimethyl thiophosphate, dimethyl dithiophosphate, diethyl phosphate, diethyl thiophosphate, diethyl dithiophosphate ( <i>optional</i> )	<b>CDC:</b> NHANES; NRHEEC <b>States or local jurisdictions:</b> survey data from human exposure capacity-building projects
<b>Health Effect</b>		
Pesticide-related poisoning and illness ( <i>core</i> )	1) Incidence of pesticide-related poisonings and illnesses in pesticide workers ( <i>core</i> ) 2) Number of non-occupational pesticide-related poisoning and illness ( <i>core</i> ) 3) Number of pesticide-related poisoning and illness in children ( <i>core</i> )	<b>AAPCC:</b> TESS <b>CDC:</b> NHDS; SENSOR/NIOSH surveillance systems; NVSS; terrorism surveillance <b>States or local jurisdictions:</b> injury indicators surveillance; ME/Cs; pesticide poisoning surveillance programs; terrorism surveillance

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### Pesticides

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Interventions</b>		
Compliance with pesticide application standards ( <i>core</i> )	1) Proportion of workers, handlers, and trainers in compliance with employee training standards ( <i>core</i> ) 2) Proportion of workers in compliance with recommendations for home and yard use ( <i>developmental</i> )	<b>CDC:</b> NHIS <b>EPA</b> <b>OSHA</b> <b>USDA</b> <b>States or local jurisdictions:</b> pesticide programs within agriculture, environment, and health agencies
Public and professional education ( <i>optional</i> )	1) Public awareness campaigns about pesticide hazards and safe application and use ( <i>optional</i> ) 2) Public and professional education about symptoms of low-level pesticide exposure ( <i>optional</i> )	<b>EPA</b> <b>OSHA</b> <b>USDA</b> <b>States or local jurisdictions:</b> pesticide programs in agriculture, environment, and health agencies
Alternatives to pesticide use ( <i>developmental</i> )	1) Number of jurisdictions in which “organic” foods are available ( <i>developmental</i> ) 2) Consumption patterns of “organically grown” foods ( <i>developmental</i> )	<b>EPA</b> <b>OSHA</b> <b>USDA</b> <b>States or local jurisdictions:</b> pesticide programs in agriculture, health, and environmental agencies, especially those with indicator projects



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### Sentinel Events

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazard</b>		
Unsafe or unhealthy environmental event or condition ( <i>optional</i> )	1) Chemical spill ( <i>core</i> ) 2) Ambient ozone concentration that exceeds the safe level ( <i>optional</i> ) 3) Ambient temperature that exceeds safe threshold ( <i>optional</i> ) 4) Disaster (e.g., natural, sociopolitical) ( <i>optional</i> )	<b>ATSDR</b> <b>DOT</b> <b>EPA</b> <b>NOAA, NWS</b> <b>States or local jurisdictions:</b> environmental protection agencies, especially those with indicator projects <b>USGS</b>
<b>Exposures</b>		
(None identified)		
<b>Health Effects</b>		
Illness or condition with suspected or confirmed environmental exposure ( <i>core</i> )	1) Asthma-related death ( <i>core</i> ) 2) Case of methemoglobinemia ( <i>core</i> ) 3) Illness attributed to ambient or drinking water contaminants ( <i>core</i> ) 4) CO poisoning (not fire-related) ( <i>core</i> ) 5) Hospitalization from lead poisoning in a child ( <i>core</i> ) 6) Consultation or emergency department visit for possible poisoning in a child, including lead poisoning ( <i>core</i> ) 7) Pesticide-related poisoning or illness ( <i>core</i> ) 8) Temperature-attributed death ( <i>core</i> ) 9) Food-borne illness ( <i>optional</i> )	<b>AAPCC:</b> TESS <b>CDC:</b> BRFSS; Food Net; Pulse Net; NHAMCS; NHDS; NHIS; NVSS <b>CDC, ARC</b> <b>EPA:</b> NMMAPS <b>HCFA:</b> Medicare; Medicaid <b>NOAA (NCDC; NWS; NSSL)</b> <b>States or local jurisdictions:</b> asthma, CDI and injury indicator surveillance; ambulatory care and hospital discharge data; ME/Cs; vital statistics <b>Private sector:</b> HMOs, medical insurers
Unusual pattern of illness or condition with suspected or confirmed environmental contribution ( <i>core</i> )	1) Rates of acute asthma events ( <i>core</i> ) 2) Rates of cardiovascular and respiratory events in persons with underlying disease on days when outdoor air standards are exceeded or when temperatures are at dangerous levels ( <i>core</i> ) 3) Cancer incidence and mortality rates, specifically lung cancer in non-smokers, mesothelioma, soft tissue sarcoma, and melanoma ( <i>optional</i> ) 4) Incidence rates for adverse reproductive outcomes, specifically low and very low birth weight and pre-term and very pre-term births ( <i>optional</i> ) 5) Incidence rates of developmental disabilities, specifically mental retardation and autism spectrum disorder ( <i>optional</i> ) 6) Incidence rates of birth defects, especially cerebral palsy ( <i>optional</i> ) 7) Syndromes with unknown etiologies that require emergency medical care or cause death ( <i>developmental</i> )	<b>CDC:</b> MACDP; MADDSP; NBDPN; NVSS <b>HCFA:</b> Medicare; Medicaid <b>States or local jurisdictions:</b> asthma surveillance programs; cancer registries; CDI surveillance; hospital discharge surveys; ME/Cs; vital statistics <b>Private sector:</b> HMOs, medical insurance companies; health care databases, especially emergency department visits
<b>Intervention</b>		
Use of surveillance and warning system ( <i>optional</i> )	1) Number of surveillance systems for sentinel events, syndromes, and unusual patterns of disease that include environmental data ( <i>optional</i> ) 2) Number of vector-control programs that use environmental data ( <i>optional</i> )	<b>CDC</b> <b>States or local jurisdictions:</b> health, environmental protection, and natural resources agencies

## V. Measures and Data Sources for Environmental Public Health Indicators

### Sun and Ultraviolet Light

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazard</b>		
Ultraviolet (UV) light ( <i>core</i> )	1) Number of days in which the UV light index exceeds a safe threshold ( <i>core</i> )	<b>EPA</b> <b>NOAA (NWS)</b> <b>States or local jurisdictions:</b> environmental protection agencies, especially those with indicator projects
<b>Exposures</b>		
(None identified)		
<b>Health Effects</b>		
Melanoma ( <i>core</i> )	1) Incidence of melanoma ( <i>core</i> ) 2) Melanoma mortality ( <i>core</i> )	<b>CDC:</b> NHDS, NVSS <b>States or local jurisdictions:</b> cancer registries; CDI surveillance hospital discharge surveys; vital statistics
Injuries attributed to UV light ( <i>optional</i> )	1) Number of corneal burns ( <i>optional</i> ) 2) Number of other eye injuries ( <i>optional</i> ) 3) Incidence of cataracts ( <i>optional</i> )	<b>CDC:</b> NHAMCS, NHDS
<b>Intervention</b>		
Public education ( <i>optional</i> )	1) Proportion of adults who follow protective measures to prevent melanoma and skin cancer ( <i>optional</i> ) 2) Proportion of adolescents who follow protective measures to prevent melanoma and skin cancer ( <i>optional</i> ) 3) Number and type of sun protection messages issued to the public ( <i>optional</i> ) 4) Number of purchases of sun blocking products ( <i>developmental</i> )	<b>CDC:</b> NHIS <b>NWS</b> <b>States or local jurisdictions:</b> health agencies <b>Private sector:</b> marketing agencies

## V. Measures and Data Sources for Environmental Public Health Indicators

### Toxics and Waste

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Hazards</b>		
Chemical spills ( <i>core</i> )	1) Number of chemical spills by type and location ( <i>core</i> )	<b>ASDR: HSEES</b> <b>DOT</b> <b>EPA</b> <b>States or local jurisdictions:</b> environment, transportation, and agriculture agencies
Toxic contaminants in foods ( <i>core</i> )	1) Levels of toxic contaminants in foods ( <i>core</i> )	<b>USDA (FDA):</b> Total Diet Survey
Hazardous waste sites ( <i>optional</i> )	1) Proportion of leaking underground storage facilities that have not been remediated ( <i>optional</i> ) 2) Proportion of identified Brownfield properties that have not been remediated ( <i>optional</i> ) 3) Tons of toxic substances and materials sold to general public ( <i>optional</i> ) 4) Proportion of population in close proximity to leaking underground storage facilities, Brownfield properties, and sites on the National Priority List and RCRA lists ( <i>optional</i> ) 5) Number of worker and community complaints about possible toxic exposures ( <i>developmental</i> )	<b>ATSDR</b> <b>CDC, NIOSH</b> <b>DOC</b> <b>EPA</b> <b>OSHA</b> <b>States or local jurisdictions:</b> agriculture and environmental protection agencies, especially those with indicator projects
<b>Exposures</b>		
Biologic markers of human exposure to heavy metals ( <i>optional</i> )	1) Blood and urine concentration level (95 <sup>th</sup> percentile) for lead, arsenic, cadmium, manganese, mercury ( <i>optional</i> )	<b>CDC: ABLES; NHANES; NRHEEC</b> <b>States or local jurisdictions:</b> lead prevalence surveys
Biologic markers of human exposure to persistent chemicals ( <i>optional</i> )	1) Serum concentration level (95 <sup>th</sup> percentile) for polychlorinated biphenyls (PCB), dioxins, furans ( <i>optional</i> )	<b>CDC: ABLES; NHANES; NRHEEC</b>
<b>Health Effects</b>		
Possible child poisoning ( <i>core</i> )	1) Consultations for child poisoning ( <i>core</i> ) 2) Emergency department visit for child poisoning ( <i>core</i> )	<b>AAPCC: TESS</b> <b>CDC: NHAMCS; NHDS; NVSS</b> <b>CPSC</b> <b>States or local jurisdictions:</b> injury indicators surveillance; ME/Cs; vital statistics
Morbidity and mortality associated with toxic substances ( <i>optional</i> )	1) Number of non-occupational poisonings ( <i>optional</i> ) 2) Number of deaths from non-occupational poisoning ( <i>optional</i> ) 3) Number of injuries resulting from chemical spills ( <i>optional</i> )	<b>AAPCC: TESS</b> <b>CDC: NHAMCS; NHDS; NVSS; NEISS;</b> <b>NIOSH</b> <b>CPSC</b> <b>States or local jurisdictions:</b> CDI and injury indicators surveillance; health agencies, occupational health and safety divisions; ME/Cs; vital statistics

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### Toxics and Waste

<i>Indicator</i>	<i>Suggested Measure</i>	<i>Potential Data Source</i>
<b>Interventions</b>		
Use of surveillance and warning systems <i>(optional)</i>	1) Number of jurisdictions that have surveillance systems for detecting methemoglobinemia and acute poisoning from lead, arsenic, cadmium, mercury, pesticides, and other chemicals <i>(optional)</i> 2) Number of fish consumption advisories <i>(optional)</i>	<b>States or local jurisdictions:</b> health, environmental protection, and natural resources agencies
Waste and toxic substances reduction <i>(optional)</i>	1) Proportion of solid waste diverted from disposal <i>(optional)</i> 2) Identified sites with completed exposure pathways <i>(optional)</i>	<b>CDC:</b> NHIS <b>EPA</b> <b>States or local jurisdictions:</b> health, environmental protection, and natural resources agencies
Public education <i>(developmental)</i>	1) Public awareness campaigns about toxic and hazardous household products <i>(developmental)</i> 2) Number of purchases of home safety and child-proofing devices (e.g., electrical outlet covers, cabinet locks, smoke detectors) <i>(developmental)</i>	<b>Private sector:</b> marketing agencies; solid waste disposal companies

## V. Measures and Data Sources for Environmental Public Health Indicators

### Water, Ambient

<i>Indicators</i>	<i>Suggested Measures</i>	<i>Potential Data Sources</i>
<b>Hazards</b>		
Monitored contaminants in ambient water ( <i>core</i> )	1) Levels of contaminants monitored under CWA and state regulations and guidelines by type of water body (e.g., surface, recreational, marine) ( <i>core</i> ) 2) Proportion of marine and freshwater recreational waters that fail to meet water quality regulations and guidelines ( <i>core</i> ) 3) Proportion of treated recreational waters that fail to meet state and local standards for free chlorine levels by type of recreational water (swimming pools, water parks, play fountains) ( <i>core</i> ) 4) Number of health-related closure days for marine and freshwater recreational areas ( <i>optional</i> ) 5) Land-use patterns ( <i>developmental</i> )	<b>EPA:</b> BEACH Program; CWA compliance data <b>USDA</b> <b>USGS (NAWQA)</b> <b>States or local jurisdictions:</b> public drinking water utilities; environmental protection and natural resources agencies; pool inspection program
Point-source discharges into ambient water ( <i>core</i> )	1) Volume of point-source discharges by type of contaminant (permitted sanitary waste disposal, sewage overflows, unintentional discharges and spills) ( <i>core</i> ) 2) Levels of mercury, dioxin, PCB, other in recreational (fishing) water bodies ( <i>developmental</i> )	<b>EPA:</b> BEACH program <b>FDA</b>
Contaminants in shellfish and sport and commercial fish ( <i>core</i> )	1) Levels of fecal coliform and mercury in shellfish beds ( <i>core</i> ) 2) Levels of mercury, dioxin, and PCB in sport and commercial fish ( <i>core</i> )	<b>FDA</b> <b>States or local jurisdictions:</b> shellfish and food safety programs in health and natural resources agencies
<b>Exposures</b>		
(None identified)		
<b>Health Effects</b>		
Outbreaks attributed to fish and shellfish consumption ( <i>core</i> )	1) Number of outbreaks by source (fish, shellfish) and etiologic agent (biologic, toxic, other) ( <i>core</i> )	<b>CDC</b> <b>States or local jurisdictions:</b> health agencies
Outbreaks attributed to ambient water contaminants ( <i>core</i> )	1) Number of outbreaks by source (freshwater, marine, treated recreational water) and etiologic agent (biologic, toxic, other) ( <i>core</i> )	<b>CDC</b> <b>States or local jurisdictions:</b> health agencies
<b>Interventions</b>		
Activity restrictions ( <i>core</i> )	1) Number and type of health-based activity restrictions ( <i>core</i> )	<b>EPA:</b> BEACH Program <b>FDA</b> <b>States or local jurisdictions:</b> shellfish and food safety programs in health, environmental protection, and natural resources agencies, especially those with indicator projects
Compliance with regulations and guidelines ( <i>optional</i> )	1) Number of fines for noncompliance with CWA regulations or local guidelines ( <i>optional</i> )	<b>EPA</b>
Public education ( <i>optional</i> )	1) Public awareness campaigns about health hazards associated with on-lot wastewater treatment systems ( <i>optional</i> )	<b>States or local jurisdictions:</b> health and environment agencies

## V. Measures and Data Sources for Environmental Public Health Indicators

### Water, Drinking

<i>Indicators</i>	<i>Suggested Measures</i>	<i>Potential Data Sources</i>
<b>Hazards</b>		
Monitored contaminants in drinking water ( <i>core</i> )	1) Number and proportion of drinking water systems that fail to meet water quality regulations and guidelines (SDWA MCLs, CCLs, state lists) by type of water supply ( <i>core</i> ) 2) Measurements of SDWA MCLs, CCLs, and contaminants monitored under state regulations and guidelines by type of water supply ( <i>core</i> ) 3) Number of citations for noncompliance with local standards for free chlorine levels ( <i>optional</i> )	<b>AWWA</b> <b>EPA:</b> SDWIS <b>States or local jurisdictions:</b> environmental protection agencies, especially those with indicator projects; Consumer Confidence Reports from local water utilities
Source water contamination ( <i>optional</i> )	1) Number and type of point-source discharges into drinking water aquifers ( <i>optional</i> ) 2) Levels of naturally occurring toxicants ( <i>optional</i> ) 3) Levels and types of contamination of private water supplies ( <i>developmental</i> )	<b>EPA</b> <b>USGS</b> <b>States or local jurisdictions:</b> environmental protection agencies, especially those with indicator projects
<b>Exposures</b>		
(None identified)		
<b>Health Effects</b>		
Methemoglobinemia ( <i>core</i> )	1) Case of methemoglobinemia ( <i>core</i> )	<b>States or local jurisdictions:</b> health agencies
Outbreaks attributed to drinking water ( <i>core</i> )	1) Number by type of water supply (including bottled water) and etiologic agent (biologic, toxic, other) ( <i>core</i> )	<b>CDC</b> <b>States or local jurisdictions:</b> health agencies
<b>Interventions</b>		
Implementation of sanitary surveys ( <i>core</i> )	1) Number and proportion of drinking water systems in which a sanitary survey has been conducted within past 5 years (by type of water supply) ( <i>core</i> )	<b>EPA:</b> SDWIS <b>USGS:</b> sewage tracer program
Compliance with operation and maintenance standards ( <i>core</i> )	1) Fines for noncompliance with SDWA regulations or local guidelines ( <i>core</i> ) 2) Citations for noncompliance with local water quality regulations or guidelines ( <i>core</i> )	<b>AWWA</b> <b>EPA</b> <b>States or local jurisdictions:</b> health agencies; public water utilities
Boil-water advisories ( <i>core</i> )	1) Number of boil water advisories by type of water supply ( <i>core</i> )	<b>States or local jurisdictions:</b> health agencies; public water utilities
Source water protection programs ( <i>optional</i> )	1) Proportion of wellheads covered by protection programs ( <i>optional</i> ) 2) Proportion of surface water supplies covered by watershed protection programs ( <i>optional</i> )	<b>AWWA</b> <b>EPA</b> <b>States or local jurisdictions:</b> health agencies; public water utilities
Public education ( <i>optional</i> )	1) Proportion of the population aware of availability and meaning of consumer confidence reports ( <i>optional</i> )	<b>States or local jurisdictions:</b> health agencies; public water utilities