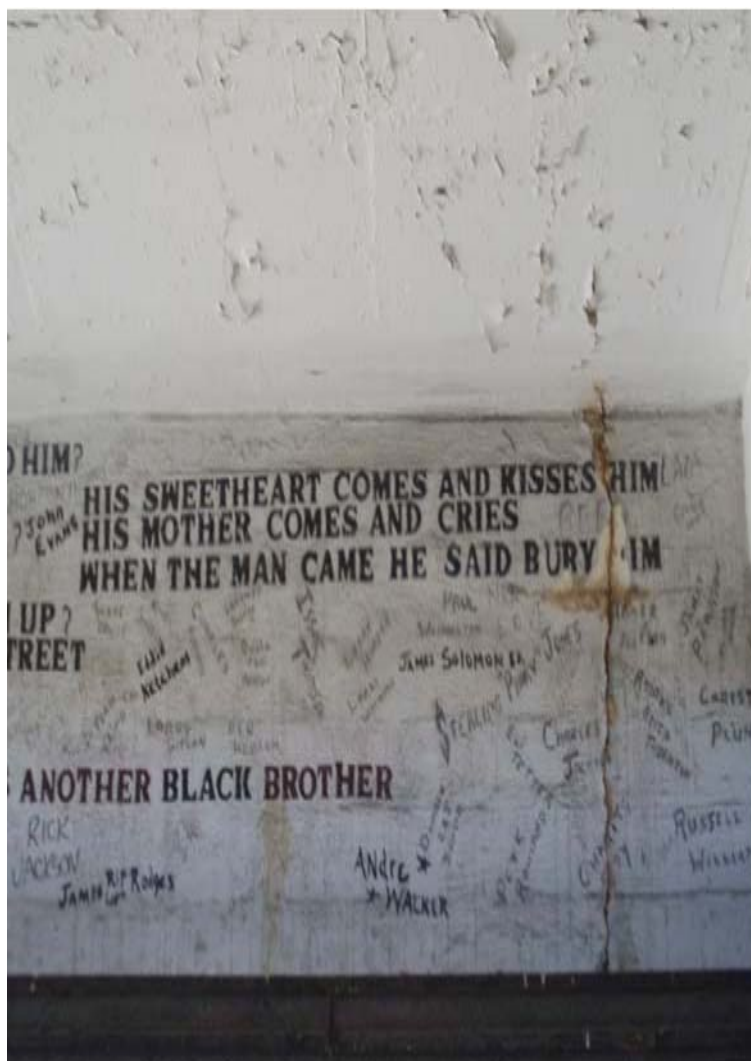


At age three, Emily Pearson was diagnosed with brain cancer. She died four years later, in 1998 – one of a cluster of 16 brain cancers of toddlers that occurred in a four-block area near Ferro Chemical in Hammond, Indiana. Ferro was releasing illegal amounts of ethylene dichloride and vinyl chloride, implicated in these cancers. Work at the Center has assisted these victims and their parents. For further information, see Kristin Shrader-Frechette, *Taking Action, Saving Lives* (New York: Oxford University Press, 2007).

## **Selected Projects of the Center for Environmental Justice and Children's Health**

Each year, the Center completes 15 to 30 student-faculty-community collaborative projects, usually co-directed by a Notre Dame student from the affected community/state/nation, and often done at the request of an impacted poor or minority group. Typical projects are the following. Recently **chemical-engineering** doctoral student Jess Anderson, an **Iowa** native, investigated health impacts from mining in Superior, **Minnesota**. **Theology** graduate student, Sr. Esther Entsiwah, a **Ghana** native, assessed African gold miners' rights to know and to consent to dangerous working conditions and cyanide pollution. **Environmental-science** major Mike McReynolds, a **Colorado** native, assessed health effects from proposed new laws for glyphosate pesticides. **Chemical-engineering** doctoral student Berlyn Mellein, a **California** native, assessed environmental-justice impacts of a proposed California high-speed-rail system. **Chemical-engineering** doctoral student Sara Nicholl, an **Arizona** native, assessed health impacts of heavy metals from two Arizona copper mines. Other typical projects include analysis of health impacts of an **Illinois** toxic-waste dump; health impacts of a proposed coastal superhighway on the poor of **Puerto Rico**; health impacts of a **Louisiana** uranium-enrichment plant affecting a poor African-American community; health impacts of a **Los Alamos** Laboratories' expansion affecting the surrounding, poverty-level, Latino population; health impacts of medical-waste incinerators in Gary, **Indiana**; and health impacts of chemical and radiological releases from **Oak Ridge (Tennessee)** National Labs, impacting the Black community of Scarborough.

Dr. Shrader-Frechette's past environmental-justice work has included a **Congo** project with the World Council of Churches --devoted to helping African nations avoid having toxic wastes, from developed nations, shipped to their lands – and helping the **World Health Organization** develop ethical standards for spraying pesticides to protect against Third-World malaria. She also has worked with the U.S. Department of Energy to set safety standards for radioactive waste – and with the governments of **Norway, Sweden, and Netherlands**, and the state of **Nevada**, to develop ethically and scientifically sound standards for managing radioactive waste. Still other projects include serving as the US representative, on the **International Commission on Radiological Protection (ICRP)** to set the first-ever environmental standards for ionizing radiation; working with NASA to develop standards for astronauts' space exposure to ionizing radiation, and with the **U.S. Agency for Toxic Substances and Disease Registry** to evaluate health risks from atomic-weapons' fallout. On **U.S. National Academy of Sciences** panels, she has helped coauthor the classic 1996 Academy document, *Understanding Risk*, and to evaluate health effects of U.S. military experimentation on U.S. civilians without their knowledge or consent. Currently she serves on the **U.S. Environmental Protection Agency's** Science Advisory Board – helping with children's exposure to pesticides, government research ethics, and bioethics at the U.S. EPA. The pro-bono EJ work of Dr. Shrader-Frechette and her doctoral students was a factor in the first major U.S. EJ victory, in **Louisiana**. In 1993 they helped stop a multinational corporation from using invalid science, misrepresenting risk, and violating consent, in an attempt to site a plant in a poverty-level, Black community.



**Graffiti in the Altgelt Gardens Public Housing Projects, Chicago**



**Offices of People for Community Recovery, Altgelt Gardens Public Housing Projects, Chicago**

### **Selected Projects of the Center**

Biologist **Mary Aildred**, a native of **Georgia**, worked with Burke County, Georgia officials to analyze flawed science and flawed ethics in permit application for two new nuclear plants in Waynesboro, Georgia. She has shown that siting criteria were inconsistent; that Southern Nuclear Operating Company failed to fully consider health impacts of the plants; and that their economic benefits do not exceed their costs and risks. Instead she has been able to show that the site was proposed mainly because Waynesboro is 63 percent African-American, 35 percent poverty level, and 50 percent unemployed – so that residents are largely unable either to assess or to oppose the facilities -- and are victims of environmental injustice.

## Selected Projects of the Center, Continued

Environmental Scientist **Kristen Ayala**, a **California** native, headed a project with the local Latino community, the San Diego Public Health Department, and the local lead-abatement program to develop better Spanish-language information materials about both lead-paint hazards and how to reduce lead in local homes. Her particular focus is Barrio Logan, where local, largely Latino, residents do not have adequate economic means to address lead in their homes. Their children's blood-lead levels are above nationally recommended levels and are the highest in the county. With no safe dose for children, lead is a known neurotoxin.

Chemist **Julian Bigi**, a South Bend, **Indiana** native who is currently a doctoral student in chemistry at the University of California, Berkeley, headed a project with the St. Joseph County, IN Minority Health Coalition and the local Department of Public Health to determine causes of high blood-lead levels in children living in homes that do not exhibit a lead-paint threat. Expenses for this project were funded by the Notre Dame Center for Social Concerns. Bigi discovered that high blood-lead levels, among local children (whose blood is tested through the WIC or Women, Infants, and Children's Program), appears to be correlated with their proximity to, and living downwind of, several local facilities that use and release the most lead.

Biologist **Erica Erickson**, a **California** native, worked with the Pala band of Mission Indians to show scientific deficiencies in the Revised Environmental Impact Report, proposed to justify siting a 308-acre San Diego County landfill adjacent to tribal lands. Besides showing environmental-justice problems with the siting, Erickson has been able to reveal flaws in the waste liner, inadequate groundwater monitoring, and threats to the San Luis Rey River, which runs through the proposed landfill.

Political Scientist **Alisa Finelli**, a **Maryland** native, worked with the Maryland legislature to show that passage of the 2007 Clean Cars Act is necessary to protect local children from ozone and particulates. Supplying her analyzes to her state senators and representatives, Finelli documented Maryland's severe asthma problems in children, showed the benefits of the new legislation, and argued that proposed state-government incentives for purchasing alternative-fuel cars, alone, would be insufficient to protect children's health.

Philosopher **Michelle Garber**, a **California** native, worked with the California Regional Water Quality Board to show that Olin Corporation's proposed cleanup of its perchlorate contamination (in Morgan Hill, CA) is logically and conceptually flawed. Garber argued that the Olin proposal was neither consistent with the best available science concerning perchlorate hazards, nor consistent with requirements of the California abatement order. She also showed that Olin plan falsely assumed (1) that there was natural-background perchlorate and (2) that the contamination could be reliably modeled using flawed scientific tools that are unable to help meet California public-health goals. Because of all these flaws, Garber has been able to show that accepting the Olin proposal would put California infants, children, and pregnant woman at special risk from health hazards from perchlorate.

Biochemist **Beth Jensen**, a **Pennsylvania** native, examined the Brooklyn petroleum spill/benzene pollution by ExxonMobil. Working with the US EPA, NY Department of Environmental Conservation, and Riverkeeper, she showed that ExxonMobil's continuing cleanup of its contamination is inadequate to protect health, will take at least 25 more years, and will continue to ensure that Newtown Creek remains the most polluted waterway in North America. Unless the state forces accelerated cleanup, Jensen showed that the ExxonMobil pollution will continue to put residents, especially children, at risk of neuro-developmental effects, immune-system damage, respiratory ailments, and benzene-induced cancer.

## Selected Projects of the Center, Continued

Chemical engineer **Elizabeth Keedy**, a **Michigan** native, has analyzed the 2007 request by East Chicago petroleum refiner, British Petroleum, to increase its releases of mercury pollution. This request would make the pollution exceed the level currently allowed by US law. Keedy has analyzed the damaging neurodevelopmental health effects of the BP proposal – especially for children. Working with local officials and citizens' groups, Keedy has also shown that there are other technical options open to BP for dealing with this pollutant, other than releasing it. Most importantly, she has shown that it is economically feasible for BP not to release higher levels of this extremely hazardous pollutant.

Biologist **Mike McCann**, a **New York** native, headed a project with New Jersey officials and the local community to scientifically assess flaws in the licensing-extension application of the Oyster Creek Nuclear Plant, near Trenton, NJ. Submitting his analyses to the US Nuclear Regulatory Commission, NJ EPA, and several nongovernmental organizations, McCann has been able to show that the reactor license should not be extended because the plant is vulnerable to terrorist attack; because the high population density in NY/NJ means evacuation (in the event of a problem) is impossible; because the environmental impact assessment failed to consider renewable-energy alternatives, as required by US law; because the drywell containment liner has been compromised; and because both children and nuclear workers face environmental injustice (greater radiation exposure) because of the problems with this plant.

Environmental engineer **Dan McInnis**, a **Minnesota** native, evaluated threats of arsenic contamination at the Heartland Partners Lite Yard Site in Minneapolis. A former pesticide-manufacturing facility at the site released many dangerous chemicals, argued McInnis, and these chemicals now threaten the largely low-income and minority neighborhood of Phillips. McInnis was able to show that (1) that the Minnesota Department of Health, in its consultation and rulings on site cleanup, failed to consider arsenic exposure from inhalation of contaminated dust and from eating vegetables grown in contaminated soil; (2) that increased cancer rates among residents may be attributable to the site contaminants; and (3) that the site clean-up standard for arsenic is too lenient to protect children and should be lowered to 20 ppm in the soil. McInnis shared his results with local community groups and state and local public-health agencies.

Biologist **Maura Nowalk**, a **Pennsylvania** native, directed a project with New Jersey citizens' groups and Pennsylvania officials to draft and introduce Pennsylvania legislation to recycle lead-containing automotive switches (typically used for car lights). These switches are significant but unregulated contributors to children's blood-lead levels. The new law, drafted by Maura and based on Maine legislation, requires recycling of all mercury-containing switches in the state. She has been able to show that Pennsylvania's mercury-containing switches annually release 780 pounds of mercury each year, although there is no safe dose of the metal, especially for young children. She also was able to show that more than 3 percent of all mental retardation is caused by prenatal exposure to mercury. Her legislation, being introduced into the state legislature, will protect children who are especially vulnerable to neurodevelopmental, gastrointestinal, and respiratory problems from mercury exposure.

Pre-medical scientist **Veronica Owens**, a **New York** native, evaluated the draft environmental assessment for a proposed natural-gas storage-factory project in Tioga County, Pennsylvania. Owens was able to show that the proposal, as outlined, would cause environmental injustice to local Pennsylvania residents because of the project's use of scarce water resources, the high risk of groundwater contamination, and adverse health effects from natural-gas contaminants such as methane, nitrogen dioxide, benzene, and organometallic compounds. Owens showed that a comprehensive environmental impact assessment must address these potential problems, and she shared her results with the Federal Energy Regulatory Commission and local nongovernmental and citizens' groups.

Biologists **Robert Plasschaert** and **Kelsey Poinsette-Jones**, South Bend, **Indiana** natives, worked with economist Marty Wolfson to lead two projects with the St. Joseph County (IN) Minority Health Coalition. Investigating the quality, price, and availability of local grocery food, one project showed that the poorest South Bend neighborhoods face nutritional injustices – more expensive food of lower quality, less variety, with less fresh produce – that do not exist in wealthier neighborhoods. Investigating local parks and greenspaces, the second project showed that there is no apparent environmental injustice, in South Bend parks, regarding access to outdoor recreational facilities. Expenses for these projects were covered by the Notre Dame Center for Social Concerns.

Philosopher **Rebecca Rambo**, a native of **Canada**, worked with the local government in Sault Ste. Marie to evaluate the ethics of repeated, massive sewage overflows into the St. Mary's River, because of Canada's inadequate sewage-treatment facility. Showing that the most damaging effects of the sewage problem harm children, indigenous people, poor people, and already-sick people, Rebecca has argued that Canada's allowing this overflow violates the rights of Canadian and US citizens. She also has showed that it is inconsistent with Canadian obligations under the Canadian Charter of Rights, the World Health Organization guidelines, the Great Lakes Water Quality Agreements, and the Canadian Environmental Protection Act. Rebecca's actions have begun the process of passing a new Canadian law to require drinking-water standards. Currently there are no drinking water requirements, but only "guidelines" which are unenforceable and threaten local health.

Peace-studies student **Jacqueline Rothschild**, a **Texas** native, worked with railroad workers and their union in Somerville, Texas to ensure better worker protection from coal-tar creosote, used to coat railroad ties. Rothschild was able to show that railroad workers faced exposure to immunotoxic polycyclic aromatic hydrocarbons from the creosote; that they were not adequately warned of the health hazards resulting from these exposures, and that, as a result, some of them likely were contracting cancer because of occupational exposure. Investigating health effects of these exposures, Rothschild shared here scientific results with railroad-worker cancer victims and their attorneys

Biologist **David Sena**, a **Cincinnati** native, evaluated the Comprehensive Environmental Response, Compensation, and Liability Act plan for Neal's Landfill in Bloomington, Indiana, Where Sena used to live. Sena showed effectively that the proposed cleanup is not the most cost-effective way to reduce pollution in Conard's Creek and Richland Creek and that, as a result, local residents, especially children, would bear severe health risks from continuing PCB pollution. In particular, Sena showed potential health threats, especially to children and breast-feeding infants, of reduced IQs, immune suppression, and disruption to their endocrine systems. Sena shared his results with the US EPA and local nongovernmental groups, in an attempt to force a safer, more scientifically defensible, cleanup of PCB contamination.

Peace-studies student **Sam Stoner**, an **Indiana** native, worked with Indiana state senators and representatives to evaluate the Second Generation On-Board Diagnostic (OBDII) Emissions Test for automobiles, now in use in the state of Indiana. Sam was able to show that the test has at least two potential problems. One is that it does not effectively monitor greenhouse-gas emissions but instead monitors only whether a computer analysis indicates the emissions equipment is functioning properly. The second problem is that the test (apparently unintentionally) discriminates against motorists who are poor, especially in Lake County, because their older vehicles are less likely to pass the test, even though many newer vehicles emit higher volumes of pollutants. Sam outlined a more health-protective, non-discriminatory program for vehicle-emissions testing.

Biologist **Tim Szewczyk**, a **St. Louis** native, worked with the East St. Louis Mayor and City Manager, with Missouri state senators and representatives, with the US Environmental Protection Agency, and with several nongovernmental groups, to evaluate the proposed clean up of Solutia (Monsanto)

Superfund sites Sauguet Areas 1 and 2. Szewczyk was able to show that the proposed site cleanup was seriously flawed for at least four reasons. These include the facts that harmful levels of PCBs would remain in the contaminated areas after cleanup, that benzene-contaminated water would not be cleaned up, that the waste-containment area is too close to the Mississippi River and could be breached in a flood, and that the levees protecting East St. Louis from such a breach are structurally unstable. Because of these flaws in the proposed cleanup, Szewczyk was able to show that the predominately minority, low-income residents of East St. Louis would be put at serious risk.



University of Notre Dame students, November 2006, with Cheryl Johnson, Co-Director of People for Community Recovery (PCR). From left are civil-environmental engineering major Charlotte Low, civil-environmental engineering doctoral student Paul Schramm, Cheryl Johnson, biological-sciences major Brianna Klco, finance and peace-studies double major Matt Cahill, and history major Erin Burns. PCR is located in the Altgelt Gardens Public Housing Projects in south-side Chicago -- the oldest public-housing projects in the U.S. Within one mile of Altgelt Gardens, in all four directions, are four toxic-waste dumps. Although such dumps are prohibited within Chicago city limits, the unincorporated, poverty-ridden, largely Black, south side of town is home to most of Chicago's dangerous waste. One result is that Altgelt Gardens residents have higher-than-average cancer rates. A number of Altgelt Gardens children have been born with cancer. Each of these students directed earlier U.S. pro-bono environmental-justice projects.S

## **Center for Environmental Justice and Children's Health**

Biologist **Carmen Adams**, a **Tennessee** native, has responded to a request for help from the St Joseph County (IN) Minority Health Coalition to help assess and reduce the



childhood obesity that is epidemic among the minority and low-income populations in the US. Causes of this obesity epidemic include stress, poverty, lack of school-related exercise, and lack of access to quality food at home and at school. To help with local assessment and amelioration of this problem, Carmen has been (1) studying the causes of heightened middle-school obesity (in minority and low-income communities), (2) assessing local middle schools to determine the severity of this problem and how it might be remedied, e.g., through restrictions on vending-machine food at school; and (3) preparing research results to share with the Minority Health Coalition. In her work, Carmen discovered that most South Bend middle schools have about two-thirds of the children on free or reduced-cost lunches, suggesting a high level of poverty. She also discovered that schools in the poorest areas often contribute to childhood obesity because they have the highest numbers of vending machines with unhealthy food. Because these schools are underfunded, they often claim they need vending-machine revenue to help meet basic needs.

Biologist **Mike Brosnan**, a **Chicago** native; psychologist **Lauren Gulley**, a **Connecticut** native; pre-medical scientist **Julie Kessler**, a **Michigan** native; psychologist **Jill Martini**, a **Pennsylvania** native; and sociologist **Elizabeth Mims**, a **Houston** native, have responded to a request (from Chicago civic and religious leaders, including the Claretians) to help protect residents of Chicago's "Back of the Yards" neighborhood (zipcode 60609) of the lower West side, near Holy Cross/Immaculate Heart Catholic Church. This poverty-level Mexican and immigrant community – made famous by Lincoln Steffens' *The Jungle* – has extraordinarily low income and educational levels. It also faces some of the worst pollution in the US. Local children are especially at risk from carcinogenic, neurodevelopmental, respiratory, and other effects of these airborne pollutants. The Notre Dame student-faculty team has been doing community work in four main areas. These include (1) documenting the nature of the most severe pollution threats faced by this poverty-level, minority community (e.g., from heavy metals such as zinc, and volatile organic compounds such as glycol ethers and xylene); (2) studying and describing the health effects and disease symptoms associated with these pollutants; (3) preparing contact information about medical, legal, and civic groups who are able to help residents address these pollution-related health threats; and (4) preparing Spanish-language materials to circulate information, within this minority community, regarding (1) – (4).

Environmental scientist **Jackie Chase**, a **Boston** native, has responded to a request for help from the St. Joseph County (IN) Minority Health Coalition to help assess and reduce the childhood obesity that is epidemic among the minority and low-income populations in the US. Causes of this obesity epidemic include stress, poverty, lack of school-related exercise, and lack of access to quality food at home and at school. To help with local assessment and amelioration of this problem, Carmen has been (1) studying the causes of heightened high-school obesity (in minority and low-income communities); (2) assessing local high schools to determine the severity of this problem and how it might be remedied; and (3) preparing research results to share with the Minority Health Coalition. In her work, Jackie discovered that most South Bend high schools have about two-thirds of the children on free or reduced-cost lunches, suggesting a high level of poverty. She also discovered that schools in the poorest areas contribute to childhood obesity because they have the highest numbers of vending machines with unhealthy food. Because these schools are underfunded, they often claim they need vending-machine revenue to meet basic needs.

Private schools, however, have either no, or severely restricted, vending machines, and their machines have healthier food

Pre-medical scientist **Kelly Dunbar**, a **New York** native; sociologist **Franchella Holland**, a **Tuskegee, Alabama** native; pre-medical scientists **Christopher Izaguirre** of **Texas**, **Jennifer Kang** of **Pennsylvania**, and **Christina Shakour** of **Indiana**; and biologist **Susan Yanik**, a **North Carolina** native, have responded to a request (from Chicago civic and religious leaders, including the Claretians) to help protect residents of the “Heart of Chicago” neighborhood (zipcode 60608) of Chicago’s lower West side, near St. Paul Catholic Church. This poverty-level Black and Hispanic community, whose members have extraordinarily low income and low educational levels, faces some of the worst pollution in the US. Local children are especially at risk from carcinogenic, neurodevelopmental, respiratory, and other effects of these pollutants. The Notre Dame student-faculty team has been doing community work in four main areas. These include (1) documenting the nature of the most severe pollution threats faced by this poverty-level, minority community (e.g., from heavy metals such as chromium, zinc, and lead, and from volatile organic compounds such as xylene and trichloroethylene); (2) studying and describing the health effects and disease symptoms associated with these pollutants; (3) preparing contact information about medical, legal, and civic groups who are able to help residents address these pollution-related health threats; and (4) preparing Spanish-language materials to circulate information, within this minority community, regarding (1) – (4).

Biologists **Danielle Gulis** and **Lindsay Martin**, both **Michigan** natives, together with pre-medical scientists **Andrew Ostrowski**, a **Georgia** native, and Christina Padayhag, a **Florida** native; and anthropologist **Maria Florencia Segura**, a **Virginia** native, have responded to a request (from Chicago civic and religious leaders, including the Claretians) to help protect residents of the South Chicago neighborhood (zipcode 60617) near Our Lady of Guadalupe Catholic Church. This poverty-level minority community, whose members have extraordinarily low income and low educational levels, consists mostly of Mexican immigrants and faces some of the worst pollution in the US. Local children are especially at risk from carcinogenic, neurodevelopmental, respiratory, and other effects of local pollutants, such as those from chromium, lead, manganese, mercury, and zinc. The Notre Dame student-faculty team has been doing community work in four main areas. These include (1) documenting the nature of the most severe pollution threats faced by this poverty-level, minority community; (2) studying and describing the health effects and disease symptoms associated with these pollutants; (3) preparing contact information about medical, legal, and civic groups who are able to help residents address these pollution-related health threats; and (4) preparing Spanish-language materials to circulate information, within this minority community, regarding (1) – (4).

Premedical-scientist **Charlie Horn**, a **Texas** native, has been working with Corpus Christi school officials to prepare grade-appropriate fact sheets about local pollutant releases that are known to endanger children’s health. Releases of air toxins in Corpus Christi are among the worst in the US, and a number of schools are immediately downwind of the releasing facilities. By helping school officials educate parents, teachers, and students, Charlie is helping parents to recognize potential environmental-health threats and to protect their children from them.

Arts and Letters student **Claire Sobczak**, a **Chicago** native, has responded to a request for help from the (St. Joseph County, IN) Minority Health Coalition to help assess and reduce the childhood obesity that is epidemic among the minority and low-income populations in the US. Causes of this obesity epidemic include stress, poverty, lack of school-related exercise, and lack of access to quality food at home and at school. To help with local assessment and amelioration of this problem, Claire has been (1) studying the causes of heightened obesity within the population of children in after-school programs; (2) assessing local after-school programs to determine the severity of this problem and how it might be remedied; and (3) preparing research results to share with the Minority Health Coalition. In her work, Claire discovered that most of the South Bend after-school programs that work with poverty-level and minority children have no food available except unhealthy food in vending machines, but that the wealthier and costlier after-school programs have nutritious snack programs.