Final Report and Recommendations: SAVI Public Health Needs Assessment

July 2007

Karen Frederickson Comer, Sharon Kandris, Jay Colbert, Neil Devadasan, and David Bodenhamer

Table of Contents

The Polis Center Needs Assessment Team

David Bodenhamer	Executive Director
Karen Frederickson Comer	Director of Collaborative Research
Sharon Kandris	SAVI Project Manager
Neil Devadasan	Lead System Engineer
Jay Colbert	GIS Analyst

SAVI Research Advisory Committee

Bob Cross	Director, Research & Planning, United Way of Central Indiana
Rose Fife, MD	Director, IU National Center of Excellence in Women's Health
David Ford, PhD	Dean of Research, IUPUI School of Liberal Arts
Roland Gamache, PhD, MBA	Director, State Health Data Center, Indiana State Department of Health
Joe Gibson, PhD, MPH	Director of Epidemiology, Marion County Health Department
John Kansky	Vice President, Indianapolis Health Information Exchange
James Klaunig, PhD	Director, IU Center for Environmental Health
Joanne Martin, DRPH	Director, IU Institute for Action Research in Community Health
Doug Miller, MD	Director, IU Center for Aging Research
John Ottensman, PhD	Director of Urban Policy and Planning, Center of Urban Policy and the Environment
Mary Beth Riner, DNS	Assistant Professor, Dept of Environments for Health, School of Nursing
Sarah Wiehe, MD, MPH	Assistant Professor, Division of Children's Health Services Research, Pediatrics
Steve Williams, MD	Director, IU Cancer Center
Eric Wright, PhD	Director of Health Policy, Center of Urban Policy and the Environment

CITATION
When referencing this report, please use the following citation information:
Comer, KF, S Kandris, N Devadasan, J Colbert, & DJ Bodenhamer. (July 2007). S*AVI Public Health Needs Assessment: Final Report and Recommendations.* Indianapolis, IN: The Polis Center, IUPUI.

SAVI as a Health and Human Services Planning Resource

As a rich source of social data about Indianapolis, the SAVI community information system has been widely used by local human service and community planners for well over a decade. With the increasing local, state, and national focus on population health and associated community determinants of health, we have witnessed growing interest in the potential public health uses of SAVI. This interest is consistent with the goals of community and economic development, and it complements and enhances the mission and goals of human service agencies.

Because SAVI provides a well-defined infrastructure for data integration and dissemination, it is well suited to serve as a coordinating system for the translation and dissemination of public health information being developed by various public health initiatives in Central Indiana. Several local public health initiatives already rely on SAVI, but to date there has not been a concerted, complementary effort to capture the output of these initiatives for the benefit of the broader SAVI audience. SAVI has the potential to leverage these public health initiatives to improve our local public health knowledge, service planning, and health promotion. This in turn has the potential to improve the quality of life and livability indices for Central Indiana communities.

Among the ways health and human service planning will be enhanced by the addition of coordinated public health information access in SAVI include improved means for:

- Assessing the relative spatial demand and supply of health and human services
- Selecting sites for new health and human service facilities
- Assessing client/patient access to health and human service facilities
- Selecting locations for services and programs to maximize accessibility by target population
- Tracking characteristics of facility catchment areas, such as of community clinics

Health practitioners and public health professionals would be able to use health-related data in SAVI for more effective planning and interventions, including:

- Tracking public health outcomes
- Understanding the socio-economic and physical environment
  - Of individual patients
  - Of community populations
- Locating target populations
  - For existing and potential health services/programs/facilities
  - For education outreach
  - To support grant applications
- Informing the public
  - About environmental risk factors
  - About disease prevalence in their communities

SAVI as a Public Health Research Resource

The expansion of the public health component of SAVI also has the potential to position Central Indiana as a leading center for clinical translational and public health research. SAVI is increasingly recognized as a powerful resource for public health research, including for the study of:

- Environmental determinants of health
- Social determinants of health
- Predictors of health knowledge
- Ecological models of health behavior
- Environmental exposure and health risk
- Health disparities
- Health service access, quality, and cost
- Efficacy of health interventions

The use of SAVI for public health research is not independent of its use for local health and human service planning. What is learned through public health research use of SAVI will have its *first benefit here*. The discoveries from this research can be translated into improved community health outreach and interventions.

Obesity is an example of a topic that currently is considered a high priority by both our local planners and our local public health researchers. Multiple obesity research initiatives are using SAVI data to investigate potential environmental (social and physical) determinants of health. The individuals participating in these research projects are also participating in local health and fitness campaigns, such as the Health by Design Coalition and FitCity, to help translate their research findings into recommendations for local planning and action. This research, with its associated intervention strategies, has the potential to enhance the quality of life of all ages of Central Indiana residents and to reduce our local health care costs.

As the public health component of SAVI expands, there is increased potential to accelerate our understanding of health issues and our application of proven health promotion and intervention techniques. This activity, especially the ability to do nationally leading translational research, in turn has the potential to enhance Central Indiana's influence on life sciences as an economic driver.

Report Background

In recognition of the local need for more easily accessible public health data, the Richard M. Fairbanks Foundation provided 2006-2007 support for a public health information needs assessment and for implementation of selected new public health-related data within SAVI. In the first phase of the SAVI Public Health needs assessment, conducted October – December 2006, the needs assessment team validated the assumption that there is local need for more health-related information in SAVI and identified the public health information requirements and priorities of the local public health community. Please see the document *Preliminary Report: SAVI Public Health Needs Assessment December 21, 2006*, for our preliminary findings and recommendations. During the second phase of the needs assessment, conducted January – March 2007, we investigated and assessed available partnerships and data sources for meeting the identified information needs. This document outlines our final recommendations and a detailed work plan for the remainder of 2007.

Summary of Recommendations

Short-term Activities (remainder of 2007)

We recommend the following 2007 deliverables:

1. Add select data categories to reflect identified local public health interests.
2. Work with the Indiana State Department of Health (ISDH) Data Committee to develop a strategy and time line for increased data exchange between ISDH and SAVI.
3. Apply the AIRS/INFOLINE Taxonomy for Human Services to all SAVI asset categories.
4. Enhance user documentation for asset datasets.
5. Add hyperlinks to other Internet sites that provide public health data and information.

We discuss these recommendations in the "Short-term Activities" section starting on page 4.

Long-term Strategy

We recommend four long-term strategies to increase the usefulness of SAVI for public health practice and research:

6. Use the health indicators identified by the national Healthy People initiative to guide the selection of local public health datasets for implementation within SAVI.
7. Expand the range of public health data and information types for inclusion in SAVI.
8. Continue to foster partnerships with external agencies to increase public health data available through SAVI.
9. Engage local researchers and practitioners in exploring how local health information can be used more widely and effectively in developing public health tools and materials.

We discuss these recommendations in the "Long-term Strategy" section starting on page 10.

Potential Future Activities

We recommend that the following activities be considered if additional funding becomes available:

10. Incorporate additional public health datasets into SAVI.
11. Federate public health data directly from external Internet mapping services.
12. Enhance online SAVI asset functionality.
13. Promote the development of templates and techniques for collection of administrative data sets to help to standardize primary data collection.
14. Develop health survey instruments and sample design techniques that can be used by communities to collect meaningful community-specific health information.
15. Develop a marketing plan to increase awareness of SAVI as a public health resource.
16. Develop educational materials focused on public health uses of SAVI.

We discuss these recommendations in the "Potential Future Activities" section starting on page 15.

Recommended Short-term Activities

1. Add select data categories in reflection of public health interests of SAVI audience

In reflection of the expressed interests of SAVI users and stakeholders, we recommend that the following public health datasets be incorporated into SAVI in 2007. The data items in this list will be refined once we collect and analyze the data.

Selected Data Categories	Source
Additional health facility data	Indiana State Department of Health
– Comprehensive Outpatient Rehabilitation Facilities	
– Certified Nurse Aide Training Sites	
– Home Health Agencies	
– Hospices	
– Intermediate Care Facility / Mental Retardation Facilities	
– Non-Certified Comprehensive Care Facilities	
– Outpatient Therapies	
– Residential Care Facilities	
Food source data	Marion County Health Department
– Bars and Taverns	
– Buffet	
– Carryout Eating Places	
– Convenience Stores	
– Convenience Stores with Gas Stations	
– Drug Stores	
– Fast-food Restaurants	
– Fast-food - Other	
– Full-service Restaurants	
– General Store	
– Golf/County/Other Club	
– Grocers- Wholesale	
– Grocery Stores	
– Hotel/Motel	
– Restaurant - Unknown Type	
– Specialty Food Stores	
– Supermarkets	
– Warehouse Clubs	
Cancer data	Indiana State Department of Health
– All Sites	
– Esophagus	
– Stomach	
– Colon-excluding Rectum	
– Rectum and Rectosigmoid Junction	
– Liver	
– Pancreas	
– Lung and Bronchus	
– Melanoma of the Skin	
– Prostate	
– Urinary Bladder	
– Kidney and Renal Pelvis	
– Brain and Other Nervous System	
– Non-Hodgkin Lymphoma	
– Myeloma	
– Leukemia	
Obesity survey data	Marion County Health Department
Child obesity survey data	
– BMI percentile statistics by gender and by race for public school students in Marion County, 2005	
– BMI percentile statistics by gender and by race for public school students in Marion County, 2005	

Selected Data Categories	**Source**
Child obesity survey data (continued)	
– BMI percentile statistics by age for public school students in Marion County, 2005	
– Percentage of Marion County students who were of Marion County students who were overweight or at risk of becoming overweight, 2005, by age group, race, and gender	
Adult obesity survey data	
– Percent of Adults Diagnosed With a Chronic Disease or Condition by a Health Professional, by BMI Category	
– Percent of Adults Who Received Advice From a Doctor About Nutrition or Physical Activity in the Past Twelve Months, by BMI Category	
– Average Number of Servings Per Day of Sweetened Drinks, Red Meat, Vegetables, and fruit, by BMI Category	
– Percent of Adults Meeting USDA and CDC Recommended Daily Fruit and Vegetable Intake, by BMI Category	
– Intention to Eat a More Healthfully Diet in the Future, by BMI Category	
– Percent of Adults Who Read Nutrition Labels When Buying Food, by BMI Category	
– Percent of Adults Who Read Nutrition Labe ls for Serving Size Information, by BMI Category	
– Percent of Adults Who Looked for Nutrition Information at Restaurants, by Gender	
– Convenient Access to a Store at Which to Buy Fresh or Frozen Fruits and Vegetables, by Household Income	
– Whether Cost of Fresh or Frozen Fruits and Vegetables Fits Within Food Budget, by Household Income	
Neighborhood-level vital statistics aggregations	The Polis Center
Birth statistics	
– Age of Parent	
– Education of Parent	
– Employment of Parent	
– Marital Status of Parent	
– Postnatal Care	
– Prenatal Care	
– Race/Ethnicity of Parent	
– Risk Factors	
– Total Births	
Death Statistics	
– All Deaths	
– Infant Deaths	
– Youth Deaths	
Waste/Toxic Sites	Indiana Geological Survey
– Brownfields	
– Commissioner Bulletin Sites	
– Composting Facilities	
– Confined Feeding Operations	
– Construction Demolition Waste Sites	
– Corrective Action Sites	
– LUST Sites (leaking underground storage tanks)	
– Open Dumps	
– Superfund Sites	
– UST Sites (regulated underground storage tanks)	
– VRP Sites (voluntary remediation program sites)	
– Industrial Waste Sites	
– Restricted Waste Sites	
– Septage Waste Sites	
– Solid Waste Sites	
– Tire Waste Sites	
– Transfer Station Waste Sites	
– TSD Sites (treatment, storage, and disposal sites)	

The list above reflects many of the priority interests and needs of the local public health community, as identified via focus group discussion and reported in our December 21 Preliminary Report to the United Way. See Appendix 4 of this report for more details about available datasets. The benefits of adding these datasets are described in the paragraphs below.

1a. Health facility data from ISDH

Adding health facility data will provide a more complete picture of health care accessibility for decision making, planning, and policy making. For example, in addition to the existing data about community clinics, community health centers, long-term care facilities, and rural health clinics, SAVI users will now also have access to data about facilities for comprehensive outpatient rehabilitation, outpatient therapies, intermediate care, mental retardation, and non-certified comprehensive care, among others. Access to health care was a priority health care issue identified by SAVI focus groups.

1b. Food source data from Marion County Health Department (MCHD)

Adding food source data will assist users in exploring the community issues of nutrition and obesity. For example, users will be able to analyze the relative availability of grocery stores versus convenience markets as well as the density of fast food restaurants. This reflects user interest in additional asset categories related to public health.

This is a dataset that could be collected on an annual basis. The Indiana Business Research Center (IBRC) has proposed to apply the North American Industry Classification System (NAICS) to the MCHD food source data in an automated fashion and is willing to provide the reclassified food source data to SAVI on an annual basis. This would allow time series comparison of food sources in Marion County, such as availability of grocery stores versus convenience markets (poor quality food) and density of fast food restaurants.

1c. Cancer data (county level) for ISDH

The addition of county level cancer data will allow users to measure and understand Indianapolis cancer status relative to the state and the nation via comparison with the Healthy People 2010 Cancer objectives. Chronic disease was a priority health issue identified by SAVI focus groups.

1d. Obesity survey data for Marion County Health Department

The addition of the obesity survey data will allow SAVI users to gain an understanding of obesity-related behaviors in Marion County. For example, SAVI users will be able to explore data on Marion County residents' perceived barriers to nutrition and physical activity, relative to data on obesity incidence, socioeconomic status, opportunities for physical activities (recreational facilities), and access to nutrition (food sources). The addition of this dataset reflects the priority interest of the SAVI focus groups in health behaviors. It also relates to one of the leading Healthy People 2010 health indicators.

We have identified two sources of survey data from MCHD that can be used as indicators in this area, the 2005 Adult Obesity Survey and the 2005 School Aged BMI Survey Results.

1e. Neighborhood-level aggregations of vital statistics data from MCHD

The creation of neighborhood-level aggregations of vital statistics data will allow SAVI users to analyze SAVI public health data at a meaningful neighborhood level. For example, users will be able to compare neighborhood level vital statistics data with neighborhood contextual data, such as socio-economic data.

This reflects SAVI users desire to have locally specific data. Currently, SAVI pubic health data (i.e., vital statistics) is are aggregated to a generic neighborhood layer that was developed by the Department of Metropolitan Development (DMD) for use in census tabulations. These boundaries focus primarily on the central part of the county, and in many cases are very large. There is a large ring on the outskirts of the county marked as "Balance of the County," which is not very useful in terms of neighborhood statistics. Recently, DMD developed a new neighborhood boundary that better represents neighborhoods, are smaller in size, and cover a larger portion of the county. As such, we recommend the aggregation of SAVI vital statistic data by the new neighborhood boundaries.

1f. Waste/Toxic Sites

The addition of waste and toxic sites will allow SAVI users to identify sources of pollution harmful to human health. This reflects SAVI users interest in data about the environment.

The Indiana Geological Survey collects this data from IDEM on a regular basis (at least annually), processes it, and makes it available on its website in spatial format. As such, we can readily collect this dataset on an annual basis for integration with SAVI data.

2. Work with Indiana State Department of Health (ISDH) Data Committee to develop strategy and time line for increased data exchange between ISDH and SAVI

2a. Address confidentiality issues associated with health data

Public health data is one of the hardest to collect because of HIPPA and associated provider concerns about protecting data confidentiality. Many potential providers, including the Indiana State Department of Health (ISDH), are investigating more sophisticated nondisclosure practices which may require SAVI to implement new and/or updated data handling and processing routines. The SAVI team has been in ongoing discussion with the State Health Data Center and will be presenting a proposed data sharing strategy to the ISDH Data Committee. We anticipate that this presentation and meeting will be the first in a series to address this complicated topic.

While there will be a cost to implementing new nondisclosure practices, a benefit is that more informative data potentially can be delivered to users. For example, rather than using a simple but crude number bumping routine to protect confidentiality, more sophisticated algorithms can be developed that only mask data when it is determined that a breach of individual confidentiality is possible. Another option to consider is randomly moving point locations of source data events to mask exact locations while retaining spatial patterns. (If we do this, we would include a note to users that locations have been randomly shifted to protect confidentiality.) Another possibility to discuss with ISDH is the development of indicators using a *combination* of source ISDH datasets, such as a measure of community access to health care based on location of health services and records of patient use of health services. Measures that are derived from multiple sources of data can be developed to avoid any reflection of or tracing back to individuals. We would approach the development of such measures as a research project and engage appropriate public health and statistics researchers.

2b. Request readily accessible health facility location data and research additional health facility data sources

ISDH maintains datasets on health facilities that are not considered confidential and that are of great interest to SAVI users. As such, we recommend that we proceed with officially requesting and collecting this data from ISDH. This relates to recommendation #1a described on page 6.

2c. Request population health data

ISDH maintains datasets on cancer incidence that are also of significant interest to SAVI users. Due to the relatively small incidence of cancer compared to the overall population, ISDH only releases this data at the county level. This is the best available data on cancer incidence and as such we recommend that we proceed with officially requesting and collecting this data from ISDH. This relates to recommendation #1c described on page 6.

3. Apply the AIRS/INFOLINE Taxonomy for Human Services to all SAVI asset categories

One of the barriers to effective use of SAVI asset data is the lack of a uniform classification scheme across all SAVI asset categories. We collect asset categories from multiple source providers, e.g., ISDH and Connect2Help (formerly Information and Referral Network, IRN), which use different categories to describe assets. Connect2Help applies a classification scheme used nationally by information and referral networks to describe human and social services. We propose to adopt this classification system for SAVI assets. Connect2Help is willing to classify all of the existing SAVI asset categories using the INFOLINE classification scheme for a reasonable, one time charge. As new asset categories emerge, we would consult with Connect2Help to confirm the correct classification. This will only be necessary when new asset categories are added (i.e., there will not be significant ongoing maintenance for using Connect2Help classification system). The application of the INFOLINE classification system can potentially help in the identification of facilities for special populations (the elderly, children, the mentally ill), as requested by SAVI public health focus groups.

We also propose the creation of an asset categorization system similar to the existing SAVI vulnerability categorization system and the assignment of a four-level categorization scheme to all current and future assets. This will incorporate the AIRS/INFOLINE taxonomy applied by Connect2Help. This will lay the foundation for the future enhancement of the online SAVI interface to allow users to select from a more detailed set of categories when selecting "Sites, Programs, and Agencies." For example, the proposed future interface enhancement would allow users to select and map private or public schools instead of only viewing all schools. In addition, users will be able to select from additional human service categories of interest to public health. For discussion of future improvements that will be made possible by the current enhancements we are recommending to the asset database, see recommendation #12 on page 16 in the "Potential Future Activities" section.

4. Enhance the documentation of the asset dataset

In addition to reclassifying data, it is critical that ample documentation of the meaning of the various asset categories be readily assessable to SAVI data users. Each asset data category needs a clear definition. We can potentially use the AIRS/INFOLINE handbook to assist with this and should consider the SAVI glossary as place for asset category definitions.

The proposed enhancements to the asset classification system and documentation will allow users to gain a clearer understanding of the meaning of each SAVI asset category for more effective analysis and decision making. For example, users will be better able to select facilities that are relevant to their public health issue of interest, such as facilities for special populations (the elderly, children, the mentally ill). Currently, ISDH and Connect2Help use different definitions

to categorize clinics, preventing users from understanding the relative types of health service provided. The new SAVI asset categories will be consistent with human service categories used nationwide. This reflects the expressed interest of the SAVI focus groups in getting more detailed asset data.

5. Add links to identified Internet sites that provide public health data and information

As mentioned in the Long-term Strategy section (see recommendation #7c on page 12), there is a growing amount of public health data and tools available on the Internet. We recommend adding relevant hyperlinks to SAVI, as identified during our public health needs assessment, including:

- Internet mapping services listed in Appendix 3.
- Resource listing of the Partners in Information Access for the Public Health Workforce (http://phpartners.org/health_stats.html).

The addition of these links will provide SAVI users with access complementary public health data and information from other Internet services. This reflects expressed SAVI focus group interest in health information in formats other than raw data and in being made aware of external public health data sources.

Recommended Long-term Strategy

6. Use Healthy People Indicators for Identifying Potential SAVI Public Health Datasets

Every decade since 1980, the U.S. Department of Health and Human Services has published national objectives for health promotion and disease prevention. These objectives are developed through a "broad consultative process" and are designed to measure progress over time. The latest publication, *Healthy People 2010*, identifies health objectives toward the goals of increasing quality and years of healthy life in the U.S. and eliminating health disparities. The associated vision "moves beyond what happens in physicians' offices, clinics, and hospitals…to the neighborhoods, schools, workplaces, and families in which people live their daily lives…the environments in which a large portion of prevention occurs." The development of the 2010 national objectives by DHHS and partnering federal agencies was "informed by an alliance of more than 350 national membership organizations and 250 state health, mental health, substance abuse, and environmental agencies" as well as through public comments received through regional and national meetings and an interactive website. [1]

While DHHS identified 28 indicators (focus areas) for *Healthy People 2010*, it identified ten "Leading Health Indicators" to measure the health of the Nation. These were selected on the basis of "their ability to motivate action, the availability of data to measure progress, and their importance as public health issues." [1] The National Center for Health Statistics maintains an interactive database called DATA2010 that contains the most recent national and state monitoring data for tracking *Healthy People 2010* objectives.

The designated Leading Health Indicators include:

- Access to Health Care
- Environmental Quality
- Overweight and Obesity
- Physical Activity
- Tobacco Use
- Substance Abuse
- Responsible Sexual Behavior
- Mental Health
- Injury and Violence
- Immunization

These leading indicators are inclusive of the public health issues identified by SAVI focus groups as currently driving local public health policy, namely health care access (and utilization), health behaviors, and chronic diseases. As such, the *Healthy People 2010* indicators and associated objectives can provide a framework for the Indianapolis community to measure and understand its health status relative to the state and the nation. The SAVI community information system provides a platform for implementing these indicators to help Indianapolis communities track their local progress toward *Healthy People 2010* objectives.

Four leading *Healthy People 2010* focus areas directly match the current interests of our SAVI users and stakeholders: 1-Access to Health Care, 8-Environmental Quality, 19-Nutrition, Overweight, and Obesity, and 22-Physical Activity and Fitness. See Appendix 1 for a list of the *Healthy People 2010* objectives that correspond to these four indicators (focus areas). See Appendix 2 for a list of the remaining 24 indicators and associated objectives. Many of these remaining focus areas also match SAVI user interests, such as 3-Cancer.

Using the national initiative as a guideline for selecting new public health datasets for SAVI will require us to stay abreast of the vision and indicators of the Healthy People program and to identify local sources corresponding to *Healthy People 2010* indicators. Many of the national indicators are not available through SAVI's traditional data sources, which are mainly administrative datasets collected by local, state, and federal public agencies for other purposes. As such, many indicators likely would require special data collection and/or translation to achieve compatibility. Because several of SAVI's existing datasets also fit these conditions, we are confident that we have the systems in place to negotiate and manage the acquisition of these data.

We anticipate the need for a community education process to support effective use of *Healthy People 2010* indicators, ideally involving local experts, including academics. This would include the selection of surrogate indicators to better match local interests and data availability.

7. Expand the range of data and information sources considered for inclusion in SAVI

7a. Maintain two different classes of SAVI public health data:

- Regular (collected at least annually, in consistent, well-documented format)
- Periodic (future updates not available, but contains information of significant interest to SAVI audience)

We traditionally have incorporated only datasets that can be collected at least annually, such as those generated by public agencies on an ongoing basis for their own reporting and/or administrative purposes. Another type of data to consider are those collected on a one-time basis by agencies to address a specific priority interest of that agency and/or the public, such as the abandoned housing survey conducted by the City of Indianapolis in 2003 in response to growing city and public concern about the public safety and health impacts of abandoned housing. While we typically have not collected one-time datasets for SAVI, as they do not support time series analysis, such datasets could be valuable to SAVI users, particularly when they are 1) related to issues of great SAVI community interest and 2) there are no better sources of such information.

We will need to develop and implement metadata standards and/or templates to address the proposed new classes of SAVI data. We will also need to provide a clear indication to users of which datasets will and will not be updated.

For any new SAVI dataset that we expect to update regularly, we must consider the long-term maintenance costs before adding it. We must also determine the planned frequency of updates for proposed datasets based both on availability of updates from the source provider and on user need. Based on our preliminary needs assessment (see *Preliminary Report: SAVI Public Health Needs Assessment December 21, 2006*), annual updates are sufficient for most users and datasets.

7b. Collect community survey data on public health issues

Through careful geo-processing and re-categorization, SAVI allows datasets from local, state, and federal agencies to be used in ways and in combinations not envisioned by the creators of the data. While such re-purposing of administrative data provides valuable information for community planning and evaluation, there often are limitations when attempting to use data that was collected for other purposes. Re-purposed administrative data can often provide statistics on the incidence of a particular event or issue (e.g., crime, disease), but it typically does not help users answer questions as to why particular events or issues are occurring.

A different type of data that typically has not been included in SAVI but which can help “fill in the information gaps” left by administrative data is community survey data. Unlike federally funded surveys such as the Behavioral Risk Factor Surveillance System (BRFSS), community surveys are often done on a one-time basis in response to a priority community issue, which is one of the reasons that SAVI has generally passed over the opportunity to incorporate such data. By not accommodating this type of data we are missing out on the opportunity to provide SAVI users with additional context surrounding issues of concern. In addition to providing a means for local agencies to more widely disseminate community survey results, SAVI may even want to consider providing local communities with the training and tools to conduct their own community health surveys through partnership with survey experts, such as those at the Survey Research Center at IUPUI.

7c. Expand the use of hyperlinks to external public health data and tools

There is a growing wealth of public health data and tools available via the Internet, including an increasing amount of spatially-enabled public health data. The Partners in Information Access for the Public Health Workforce has compiled a list of some of the available resources (see http://phpartners.org/health_stats.html). Although many of these data and tools cannot practically be integrated into SAVI because of issues of software platform, data format, and/or system security, among others, SAVI users would benefit from awareness of these additional information sources. As such, we recommend the ongoing identification and inclusion of hyperlinks to external public health data and analysis services that are complementary to SAVI. This should include links to relevant, non-spatial public health information, such as literature reviews and study findings.

Another means of expanding the volume and breadth of public health data available via SAVI is to link the SAVI Internet Mapping Service with other similar (compatible) Internet mapping services. This is discussed as a future recommendation (#11) on page 15.

7d. Expand the amount of summary and comparative public health statistics and reports

Many agencies that use SAVI do not have staff members dedicated to data development and analysis. As such, we propose to generate and present more summary and comparative public health statistics and reports that are readily usable by this part of the SAVI audience. Another option to address the needs of this audience is to develop an online directory of experts and projects in public health, assuming, of course, that we will be able to locate a continually up-to-date source for this information.

8. Continue to foster partnerships with external agencies and initiatives

Although outside of the public health funding scope for 2007, we recommend that the SAVI team and stakeholders continue to foster partnerships with external agencies that can lead to future opportunities to increase public health data available through SAVI. Below are several examples of new partnerships and/or initiatives that promise to enhance the breadth of SAVI data holdings and/or user audiences.

8a. Preliminary Needs Assessment with Indiana Prevention Resource Center

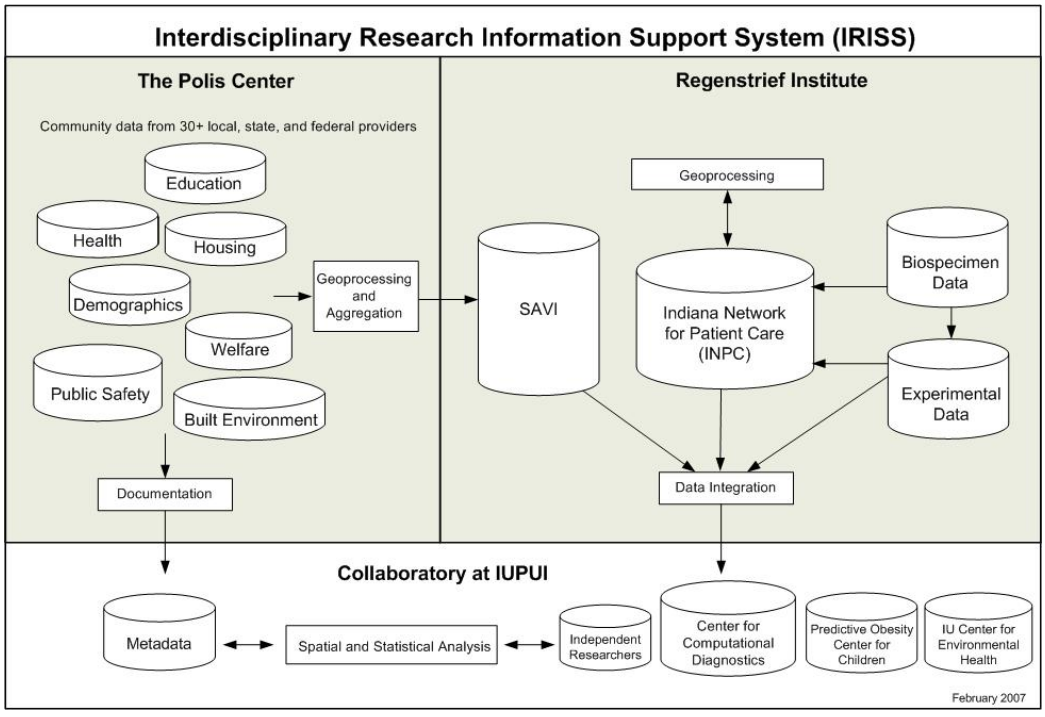
The Indiana Prevention Resource Center (IPRC) at IU assists Indiana-based alcohol, tobacco, and other drug prevention professionals and volunteers and government officials in providing evidence-based prevention programs, policies, and practices to the general public. To assist with prevention planning, IPRC has created the PREV-STAT statewide information system to provide searchable databases of census and alcohol, tobacco, and other market research data.
We contacted IPRC for the SAVI public health needs assessment to determine whether IPRC could make its data available to SAVI. We learned that while IPRC has a wealth of data at a detailed geographic level, it generally only publishes its data at the county level and in static, PowerPoint format. Given its current means of processing data, IPRC does not have the staff resources to generate and publish data and reports at lower geographic levels. Based on this discovery, we are now working with IPRC on a preliminary needs assessment of its data processing to determine how it can be systematized to reduce the amount of IPRC staff effort that is needed and to allow data to be made available on a more frequent basis, in a more interactive format, and at a more detailed geographic level. IPRC and Polis will jointly pursue funding for the proposed systemization work. The potential benefits to SAVI audiences include access to new public health related data on an annual basis, including datasets related to health behaviors, such as the Consumer Behavior/Spending and the Tobacco Retailer Inspection Program (TRIP) datasets.

8b. Research on Developing Useful Information on Access to Health Care in Indianapolis

Via the needs assessment, we learned that there are not readily available spatial datasets to assist policy makers, citizens, and researchers in exploring the issues of health care access in Indianapolis. While mapping physician locations was considered as one option for identifying access to health care, we learned that it is problematic to tie physicians to a single practice location and also that many physicians are licensed to home versus work addresses. As such, we propose instead to explore the collection and mapping of the health services available at health facilities in Indianapolis. The Regenstrief Institute has expressed interest in partnering with Polis to pursue research funding to further explore this issue. We envision expanding this researcher partnership to include the State Health Data Center and the Center for Health Policy at IUPUI.

8c. Collaboration with Regenstrief Institute on the Interdisciplinary Research Information Support System

Polis is partnering with researchers at the Regenstrief institute to develop strategies for the integration of SAVI and the Indiana Network for Patient Care (INPC). We expect the integration of social and environmental data from SAVI with clinical data from INPC to foster interdisciplinary collaboration for research, public health, and, ultimately, clinical medicine. Very few universities can combine such resources, as well as expertise in the social sciences and health research, to create the requisite environment for successful interdisciplinary public health endeavors. Polis and Regenstrief have written a detailed proposal for an Interdisciplinary Research Information Support System (IRISS) and currently are pursuing external funding to support this effort. See below for a diagram of the proposed system. This system will be an invaluable resource for clinical translational research.



8d. Quality of our Lives Information System

The Marion County Health Department has recently contracted IUPUI to develop a user-friendly, interactive Web portal of quality of life information for Marion County residents. The goal of the

"Quality of our Lives" (QooL) website is to tap existing information resources and expertise to engage concerned citizens in efforts to improve public health by informing them about policy issues, encouraging dialogue, and building a stronger social network to address quality of life issues in Marion County. Showing Marion County progress related to quality of life factors is a key goal of the planned QooL website. QooL stakeholders consider the time series SAVI database as the key repository and source for local quality of life indicators. Appendix 5 lists available SAVI variables that correspond to QooL topic areas. In addition, the QooL community working group selected obesity as a focus topic for the pilot website. QooL project partners would like SAVI to include additional public health datasets related to obesity. As SAVI continues to increase its available public health datasets to serve public health professionals, it will also provide an increasingly richer set of public health indicators to be tapped by the QooL website.

8e. Family Violence Institute

The Family Violence Institute (FVI) at the IU School of Medicine is focused on how to assess, study, prevent, and manage family abuse, targeting abusers and victims alike. One of the institute's goals is to provide the infrastructure for growing the research base in this area. FVI leaders consider SAVI a key resource for the institute and have invited the Polis Center to be a member of the institute to work with other members toward developing and providing the needed community data and information resources for FVI research, service, and education.

8f. Indiana University Clinical Translational Science Award Proposal Team

The team of academic and research leaders working on IU's October 2007 application for an NIH Institutional Clinical Translation Science Award (CTSA) consider SAVI a significant selling point in terms of the local resources available to support an innovative and effective program of clinical translational research. Translational research includes research aimed at enhancing the adoption of best practices in the community and the cost-effectiveness of prevention and treatment strategies. Clinical translational research is a key component of NIH's Roadmap for Medical Research [4] and an institutional CTSA is critical to IU's future success in attracting NIH funding. SAVI will play a key role via its ability to support associated clinical research, including epidemiologic and behavioral studies, outcomes research, and health services research.

9. Engage local researchers and practitioners in exploring how local health information can be used more widely and effectively and in developing associated tools and materials

Local public health researchers and practitioners, including but not limited to those associated with the Regenstrief Institute, the Indiana Children's Health Services Research Center, the IU School of Nursing, the IU Masters of Public Health Program, and the IU Center of Excellence in Women's Health, can be of great assistance to us in exploring how to make local health data and information more useful and accessible to local communities via the SAVI website. (These units are active participants on the SAVI Research Advisory Committee and have been very helpful during the SAVI Public Health Needs Assessment.) We propose to continue to engage them to assist us in identifying data and information that can serve as meaningful public health indicators and in designing useful online public health analysis tools.

Potential Future Activities

10. Add additional public health datasets into SAVI

As additional funding becomes available, we propose to collect and implement additional public health data for SAVI, such as those data listed below:

Data	Source
Hospital discharges	Indiana State Department of Health (ISDH)
In-patient procedures	""
Birth defects	""
Communicable diseases	""
Primary care resources and utilization for small areas	Health Resources and Services Administration
Morbidity	Stats Indiana
Environmental quality data	Indiana Department of Environmental Management and ISDH

The list above includes additional sets of highly desired public health data as identified via focus group discussion and reported in our December 21 Preliminary Report to the United Way. See Appendix 4 of this report for more details about available datasets. The datasets selected for future implementation will be determined by the amount of available funding and confirmation of user need and interest. As included in our recommended long-term strategy, we propose to use the Healthy People 2010 initiative as a framework for future discussions with SAVI stakeholders and public health users.

11. Federate public health data from external Internet mapping services

Currently, we physically collect source SAVI data from external data providers, process it in-house, and then publish the created data categories to the SAVI web site via a custom SAVI Internet mapping service (IMS). With a growing number of data providing organizations now implementing their own Internet mapping services or IMS (see Appendix 3), we can envision moving to a federated approach for SAVI. Rather than collecting and processing data in-house, we would create links between SAVI and the other IMS that allow data categories from those external web services to be overlaid and viewed with the data categories published online by SAVI. Such an approach would allow a much larger set of data to be tapped by SAVI users, and it would reduce the data processing costs for SAVI. While this type of linkage is technically possible, there are multiple barriers that will be costly to address.

The main barrier to this approach is the associated lack of flexibility in display and querying data from other IMS services. Map symbology is set by the source IMS service and can not be changed readily when incorporated into SAVI. Other IMS services may use map color schemes different than the yellow to green color ramp currently used for the display of all SAVI vulnerability data. Middleware potentially could be designed to translate between color schemes. This would be a complex programming task.

Another barrier is that other IMS services likely will not use the same data attributes that SAVI map layers have and thus there will be difficulty in using SAVI's online identify tools to show attributes associated with map layers from external services. SAVI vulnerability data is currently topically categorized to allow users to drill down and retrieve maps, tables, and charts. For external data that does not match SAVI's schema, it would be problematic to display that data using the table and chart tools in SAVI. Middleware could be developed that would allow data

categories from an external IMS to be "mapped" to SAVI data categories in support of using data directly from the external IMS. This would not be an insignificant task. Alternatively, we could manually add the external categories to SAVI that do not already exist there. This will require the further expansion of the SAVI data classification scheme and ongoing manual maintenance work.

At first glance, connecting SAVI directly to the data layers published via external IMS services can appear to be a time-saving task. Such an investment could translate into long-term cost savings (and the ability to tap into an even larger wealth of public health data). However, this would require a significant redesign of the core SAVI Internet mapping system. GIS and IMS technology has advanced significantly since the SAVI IMS was developed. The SAVI system design team recommends that it first address the need to migrate the core SAVI system to the latest technology versions and tools. This would make the (future) work of linking SAVI to external IMS sites much easier and allow more effective data and information access.

We recommend that the SAVI system be adapted to allow it to interoperate with external data web services and that SAVI adopt a long-term goal of federating public health data directly from other Internet mapping services as they become available.

12. Enhance online SAVI asset functionality

Building upon the recommended 2007 enhancements to the asset database, we recommend that during the next scheduled enhancement phase of SAVI that online functionality be added to allow users to:

- View time-series asset data on the web to make assessments about the relationships between availability of community assets over time in relation to need

  For example, does community health increase over time with the addition of supermarkets, community health centers, etc? Is there a relationship between the increase in fast food restaurant locations and the surrounding neighborhood's obesity rate? The ability to view time series asset data was identified by focus groups as being of great interest.

- View supplemental data about each asset to make more informed decisions

  For example, users could assess the capacity and services provided at each community clinic location or the number of beds at each long-term health facility. If users were trying to identify a school for targeted health education, they would be able to search for all schools where more than 25% of the students failed to meet state achievement standards rather than just identifying all schools.

- Select assets in a drilldown manner

  For example, users would be able to select the asset categories of "Education" then "Private Schools" and then select between elementary and secondary schools.

- Change map display based on the supplemental asset data

  For example, users could change the color of the point for each place of worship based on its number of members, allowing them to identify the potential level of partnership that existing community assets could provide.

13. Promote the development of templates and techniques for collection of administrative data sets to help to standardize primary data collection

Many local agencies involved in public health program work are not collecting data about their efforts due in part to lack of time and lack of expertise in data collection. By encouraging local agencies with templates and techniques for their own data collection, we can increase their ability to use SAVI to justify and evaluate their programs.

14. Develop health survey instruments and sample design techniques that can be used by communities to collect meaningful community-specific health information

Another type of data that can be of use for community health planning is survey data. By providing tools and assistance to local agencies for the development and execution of meaningful community surveys, we can further enhance their ability to evaluate the need for and impact of their programs.

15. Develop a marketing plan to increase awareness of SAVI as a public health resource

To maximize the benefit of adding new public health data to SAVI, it will be important to make existing as well as potential new SAVI users aware of these additions and the potential public health applications. The public health community responsible for managing public health issues has the most to gain from the addition of public health data to SAVI. As such, we recommend that we target our marketing plan toward public health professionals, including public health researchers, care givers, decision makers, and advocates.

16. Develop educational materials focused on public health uses of SAVI

To go in hand with a plan to increase awareness of SAVI as a public health resource for public health professionals, it will be helpful to provide examples and tutorials that demonstrate the potential public health uses of SAVI.

Bibliography

[1] US Dept of Health and Human Services. 2006. *Healthy People 2010 Mid-Course Review* (Executive Summary).

[2] Stover, J. 2007. "Who's Using Geographic Information Systems (GIS): A Survey of STD Programs: Results of the GIS/Geocoding and Data Confidentiality Survey", (Division of Disease Prevention, Virginia Department of Health), *GIS & Privacy in Public Health Webcast,* Association of State and Territorial Health Officials, Washington, DC, May 9, 2007.

[3] Center for Disease Control (CDC), 2005. "CDC/ATSDR Policy on Releasing and Sharing Data", Manual GUIDE: General Administration, CDC-102, Date of Issue: 04/16/03 Updated: 09/07/05 [1] [2] [3], CIO Contact: Office of the Director, Associate Director for Science. http://www.cdc.gov/od/foia/policies/sharing.htm

[4] NIH Office of Portfolio Analysis and Strategic Initiatives (OPASI), *Re-engineering the Clinical Research Enterprise.* http://nihroadmap.nih.gov/clinicalresearch/overview-translational.asp