Esri News
for Health & Human Services
Summer 2015

Treating Refugees, Three Minutes at a Time

Emergency medical response nonprofit works faster and smarter with offline GIS mobile tools

Esri Technology
- Survey123 for ArcGIS
- ArcGIS Online

For anyone like the millions of Syrian people seeking refuge, living in crisis and extreme poverty poses many health risks. Poor skin care is a danger, and it's often a neglected area of public health.

Untreated skin conditions can lead to troubling health issues, such as physical pain, infection, and the inability to work. To help Syrian refugees at risk of such issues, Direct Relief—a global nonprofit that provides medical resources in more than 70 countries—organized a six-day mission to treat and document skin conditions among refugees living in a rural area of Jordan. With several obstacles ahead and hundreds of people in need of immediate medical attention, Direct Relief incorporated Esri's latest geographic information system (GIS) technology into its action plan to take its mission to the next level.

Navigating a Crucial Process

The teams that Direct Relief dispatched consisted of a general practitioner, a dermatologist, and a medical record scribe who worked together each day in an outdoor tent, treating as many patients as possible before sunset.

With limited resources and only daylight available, teams had approximately three minutes to diagnose, treat, and record each patient's visit. And with hundreds of refugees to treat in Jordan, Direct

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↑ Direct Relief built a powerful survey tool fast with Survey123 for ArcGIS. The custom mobile app delivered advanced logic and branching, embedded images and audio, and multilingual capabilities.

← Fieldworkers saved critical time when entering patient data with the mobile app's offline capabilities.

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Treating Refugees, Three Minutes at a Time

continued from cover

Relief needed to speed up the medical data collection process while maintaining accuracy. To ensure local partner agencies could locate patients and provide critical follow-up care, the organization also needed to capture and share patients' geographic information as part of triage.

"Under these demanding field conditions, any amount of time a scribe spends not being able to see a computer screen properly or waiting for the next survey to load—all of these moments add up and become critical to the whole process working smoothly," said Andrew Schroeder, Direct Relief director of research and analysis.

↑ Top: Direct Relief medical teams embarked on a six-day mission in rural Jordan to treat Syrian refugees. Each team was supplied with Android mobile devices equipped with Survey123 for ArcGIS. Bottom: Medical scribes worked quickly, efficiently, and securely while recording patient medical and geographic data in custom forms.

Equipped with the Right Tools

Direct Relief worked with Esri to identify a solution to meet the teams' critical needs. The nonprofit supplied each medical record scribe with an Android tablet equipped with Esri's new Survey123 for ArcGIS app. Survey123 for ArcGIS supports disconnected editing and simple data capture through customizable forms. Despite the remote nature of the refugee camps and limited time, the scribes were able to easily use the app as part of the triage process.

Using the app's offline capabilities, scribes quickly entered accurate data for each patient, including name, symptoms, diagnosis, and location. Teams also uploaded audio and photos to medical records and used the app's multilanguage function in the surveys. When teams returned to camp each day, Direct Relief was able to sync and instantly share the data with partner agencies via real-time maps hosted in ArcGIS Online.

Solutions That Succeed Offline

By implementing an efficient data entry workflow with Survey123 for ArcGIS, teams maximized their time in the field and shared data-rich maps with partner agencies. Direct Relief treated and collected data on up to 200 patients per day and managed to record information on more than 1,200 refugees in six days.

"With Survey123 for ArcGIS, our goal was to see as many refugees as possible with skin conditions. It was a success. We provided treatment for everyone who needed it and were able to turn over a useful dataset to our local partner to continue [the team's] efforts," Schroeder said.

Partner agencies were able to utilize the shared data to identify the exact location of patients who needed critical follow-up care and prioritize where to dispatch medical teams based on the severity of patients' conditions. Local agencies also relied on embedded audio and photos in patient medical records to provide optimal follow-up care.

Direct Relief continues to use the data collected from the campaign to determine where to allocate limited resources. Since Survey123 for ArcGIS forms are based on the XLSForm specification, organizations can capture virtually any kind of information they need.

"We learned how to build complex surveys fast," Schroeder said. "In the future, we foresee that Survey123 for ArcGIS will be useful for disaster response situations or anything time-sensitive that requires us to collect and share data."

Direct Relief is now looking to use this data to build web applications and story maps. The nonprofit plans to leverage ArcGIS Online to further share the results of the teams' work so other nonprofits can use the refugee medical data in their planning.

For more information, visit survey123.esri.com or contact Andrew Schroeder, Direct Relief director of research and analysis, at ASchroeder@directrelief.org.

Mobile-Friendly Web Maps Feed Need for Fresh, Healthy Food

Esri Technology
ArcGIS Online

The season of good eating is in full swing in Minnesota. In Hennepin County, farmers' markets are the link between the dinner table and the farm fields.

As part of an effort to make healthy eating effortless, Hennepin County GIS and Hennepin County Public Health combined forces to create a mobile-friendly web mapping application to help residents and visitors find farmers' markets and mini markets in their neighborhoods or while they are on the go.

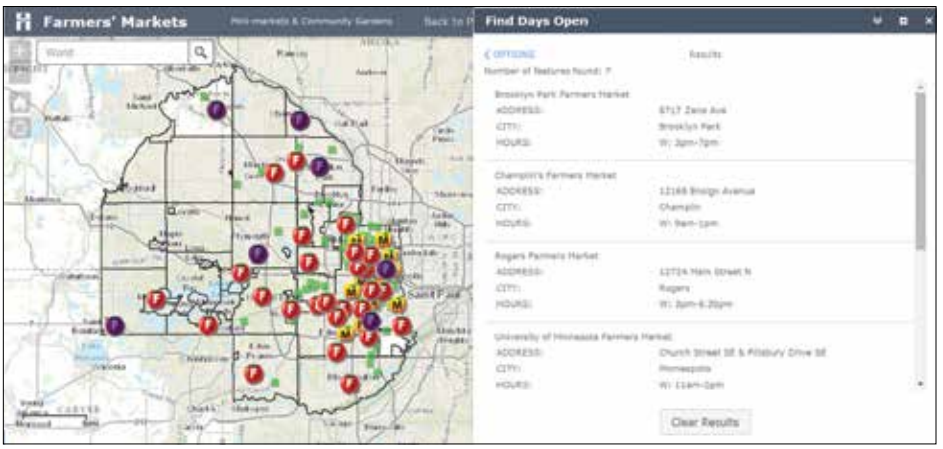
"Today, farmers' markets are popping up in more and more locations, making fresh, locally raised produce available to folks in previously isolated neighborhoods," said Bill Belknap, spokesman for Hennepin County Public Health. "Healthy food choices translate to better health. Making these markets easier to find makes healthier food choices easier to make."

Tap Into the Fresh

From a tablet or mobile phone, residents and nonresidents can explore the Farmers' Markets, Mini Markets, and Community Gardens map at www.hennepin.us/farmersmarketmap. Users can customize the map by entering a home ZIP code or current street address. The map will zero in on the selected location; users can click on individual sites for an address, days and hours of operation, contact information, and a website link (when possible). Users of desktop and laptop computers can access the same information in larger format on the full map.

The map also includes the specially marked locations of community gardens, where people can grow their own fresh produce for personal use, not for public sale.

↑ Hennepin County's mobile-friendly web mapping application is designed to help residents and visitors find farmers' markets and mini markets in their neighborhoods.



↑ Users can filter their search by days of the week to see which markets are open.

Dig Into Mapping Data

The application is only one part of a larger initiative to make public information more usable for Hennepin County residents. Other projects include park maps, public health, construction, property values, and taxation information. Applications are scattered throughout the county website, but several can be found at www.hennepin.us/gis. Users familiar with GIS software can also download data directly.

Jay Meehl, health GIS coordinator for the county, developed the online application.

"County residents want easy access to information and locational services from any device, anywhere," he said. "We need to keep up with these trends by providing interactive, mobile solutions."

For more information, contact Jay Meehl, health GIS coordinator, at jay.meehl@hennepin.us.

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Fighting Social Disparities across the Map

By Alyssa Vergara, Research Assistant and Graduate Student with the University of Southern California School of Social Work

Esri Technology
ArcGIS for Desktop

California is in an affordable-housing crisis. The Golden State has the second-lowest home ownership rate and the second-highest median property value in the United States. Although the fiscal challenges of home ownership drive more than 40 percent of the state's residents to rent, California's average monthly rent is 50 percent higher than the rest of the country.

Take Orange County, for example. This county of 3.1 million residents is one of the country's most expensive rental markets, with 90 percent of low-income households spending at least one-third of their income on rent each month. According to a 2014 report commissioned by state housing authorities, building affordable multifamily housing can provide many socioeconomic benefits to populations similar to the low-income residents of Orange County.

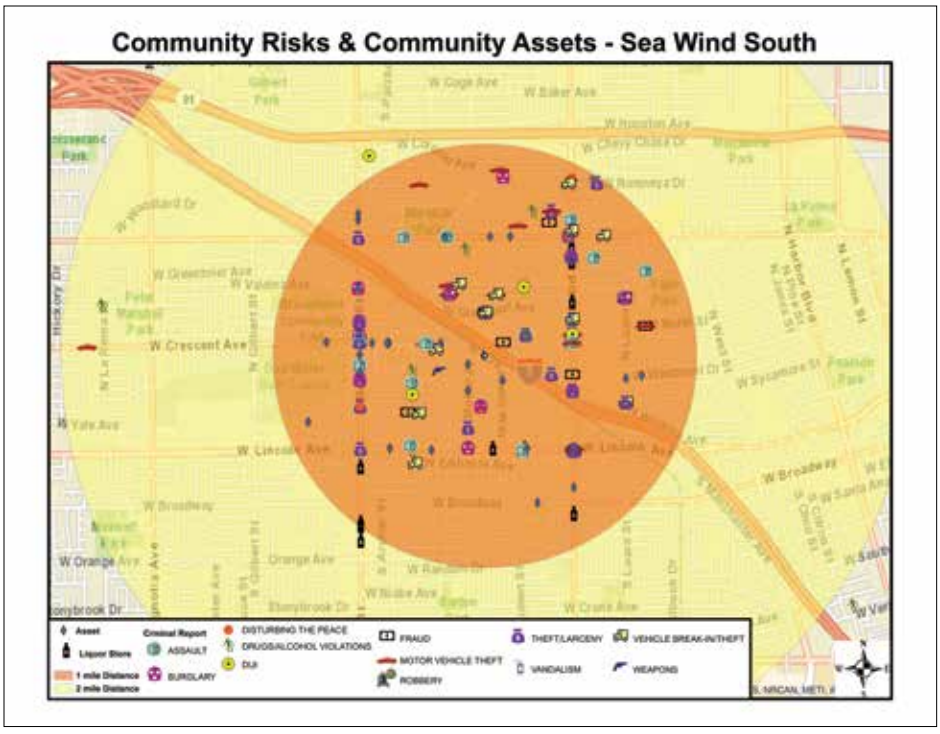
Affordable housing reduces residential instability and enhances educational outcomes for children. It also improves families' health by relieving their household budgets so that they can afford food, health care, and other basic living expenses.

Even so, securing stable housing is only half the battle. According to the National Resident Services Collaborative, more than four million US families living in government-assisted rental units earn less than 30 percent of their area's median income. Health and education challenges abound for many low-income families in affordable housing; much of this is attributed to environmental factors.

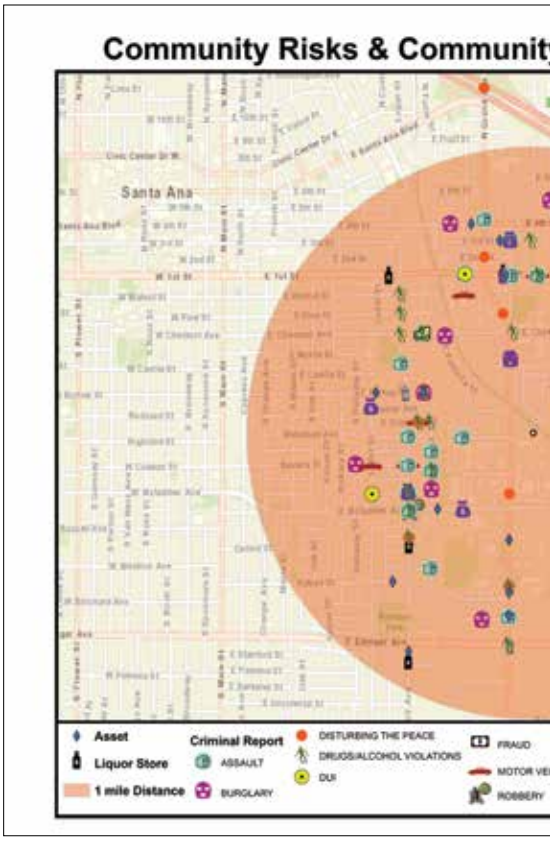
Bridging the Gap with Social Services

Researchers at the University of Southern California (USC) School of Social Work recently applied geography to examine whether a service-enriched housing model could reduce socioeconomic and health disparities for children and families living in affordable housing communities.

The service-enriched housing model provides on-site social services to residents, including educational and nutritional resources. Led by USC professor and lead researcher Dr. Juan Araque, the research team sought three affordable housing sites in Orange County to test the model. The team used authoritative data, available through Esri's ArcGIS platform, to identify three sites that were comparable in location and composed predominantly of residents who were Hispanic with low income. The researchers also employed the ArcGIS platform to map key community assets and risks within a one-mile radius of each of the three apartment complexes. Assets encompassed neighboring parks, schools, grocery stores, and recreational centers. Risks were represented by the number of



↑ The ArcGIS platform identified that Sea Wind South, the control group that received no services, had 146 crimes reported during the study time frame. Both Sea Wind South and Warwick Square face higher crime rates than middle-to-upper-class socioeconomic communities in Southern California.



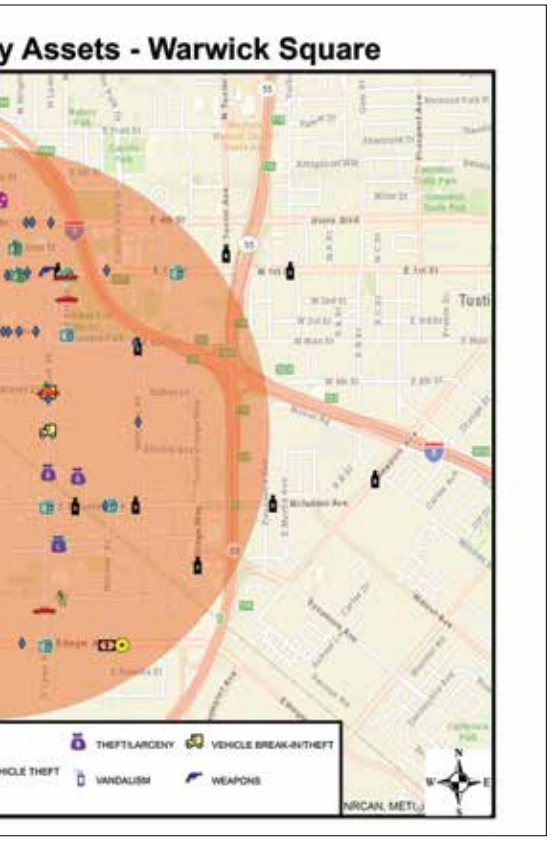
liquor stores and bars and the individual community crime rate.

By teaming up with Project Access, a reputable nonprofit specializing in residential services, the researchers administered different "dosages" of adult nutrition classes and youth after-school programming to each community. One site received full-time services (experimental group); another, part-time (comparison group); and the third, no services (control group). The team's ArcGIS maps displayed comparable numbers of both assets and risks for the full-time services site and the no-services site. Spatial analysis of risk factors alone found that the two apartment complexes had specifically similar crime rates.

The community crime rates were determined by the total number of police reports made during the month of June 2014. While the full-time and the no-services sites each had more than 100 criminal activities with varying degrees of severity reported to local authorities throughout the one-month time frame, the part-time site had only one criminal activity: nonaggravated assault. Moreover, the part-time site had few risk factors altogether.

"Collecting data on these sociogeographic variations proved to be of the utmost importance when analyzing the study's outcome," Araque said.

↓ Warwick Square, the experimental group that received full-time services, had a total of 126 criminal activities that were reported to the corresponding authorities during the month of June 2014.



Connecting Location with Program Performance

While the study is ongoing and researchers continue to collect data, year-one results revealed stark differences across the three locations. The research team mapped data via ArcGIS for Desktop and discovered that residents at the full-time programming site strongly outperformed the other two sites. Spatial analysis revealed that residents achieved greater gains in positive relationships and healthy lifestyles and participated more in community programs. The full-time group also had higher satisfaction rates, with residents from the other two sites voicing concern about a lack of services.

Residents at the part-time site wanted more program hours and scheduling flexibility. Participants who received no programming expressed a strong desire for residential services and cited an inability to participate in programs elsewhere due to transportation barriers, long waiting lists, and high costs.

According to the first-year investigation, full-time services do have a significant impact on the lives of low-income families, especially with regard to their sense of community and perception of whether their needs are being met. However, part-time and no-services participants had nearly identical levels of perceived quality of life and community engagement. This is especially telling considering that the part-time site is situated in an area with a much lower crime rate than the other two sites.

Data Says All or Nothing

Social science studies conducted in the field are different from those inside the laboratory because researchers cannot control every variable. In these instances, it is pertinent to consider any influencing factor that might make a difference in the study's outcome. While it would have been ideal, albeit unrealistic, to have comparable crime rates across all three sites at the outset, in this instance geospatial analysis lends credence to the researchers' conclusion: part-time services have little impact on residents' quality of life.

"Suppose the results had been different and the experimental group had fared just as poorly as the comparison and control groups, in spite of full-time programming," Araque said. "If this had been the case, we might not have been certain whether the programming itself was insufficient, or if the community environment, including risk factors and crime rates, were influencing residents' attitudes."

Because the full-time group did benefit, researchers determined that the number of community risks identified with the ArcGIS platform did not confound the impact of on-site programming.

The study has important implications for social policy, as the Tax Credit Allocation Committee (TCAC) of the California State Treasurer's Office awards tax credit points to housing developers that provide different dosages of programming. Since the ArcGIS platform helped illustrate that full-time services have a far more substantial impact than part-time services in spite of sociogeographic variables, the research team recommends that TCAC not award points for part-time programming.

"In order to truly make a difference in the lives of low-income families, a full-time service-enriched model of affordable housing should be standard," Araque said.

For more information, contact Dr. Juan Araque, USC professor and researcher, at araque@usc.edu.

The Changing Face of Health in Five Maps

Using GIS to Identify Gaps in Care, Increase Food Security, Combat Big Tobacco, and Much More

Complex health data is no longer restricted to static forms and tables. Today's health and human services professionals interpret facts and figures in a geographic context. Interactive maps and spatial analysis help leaders prioritize spending, site service locations, identify vulnerable populations, and tell people's stories.

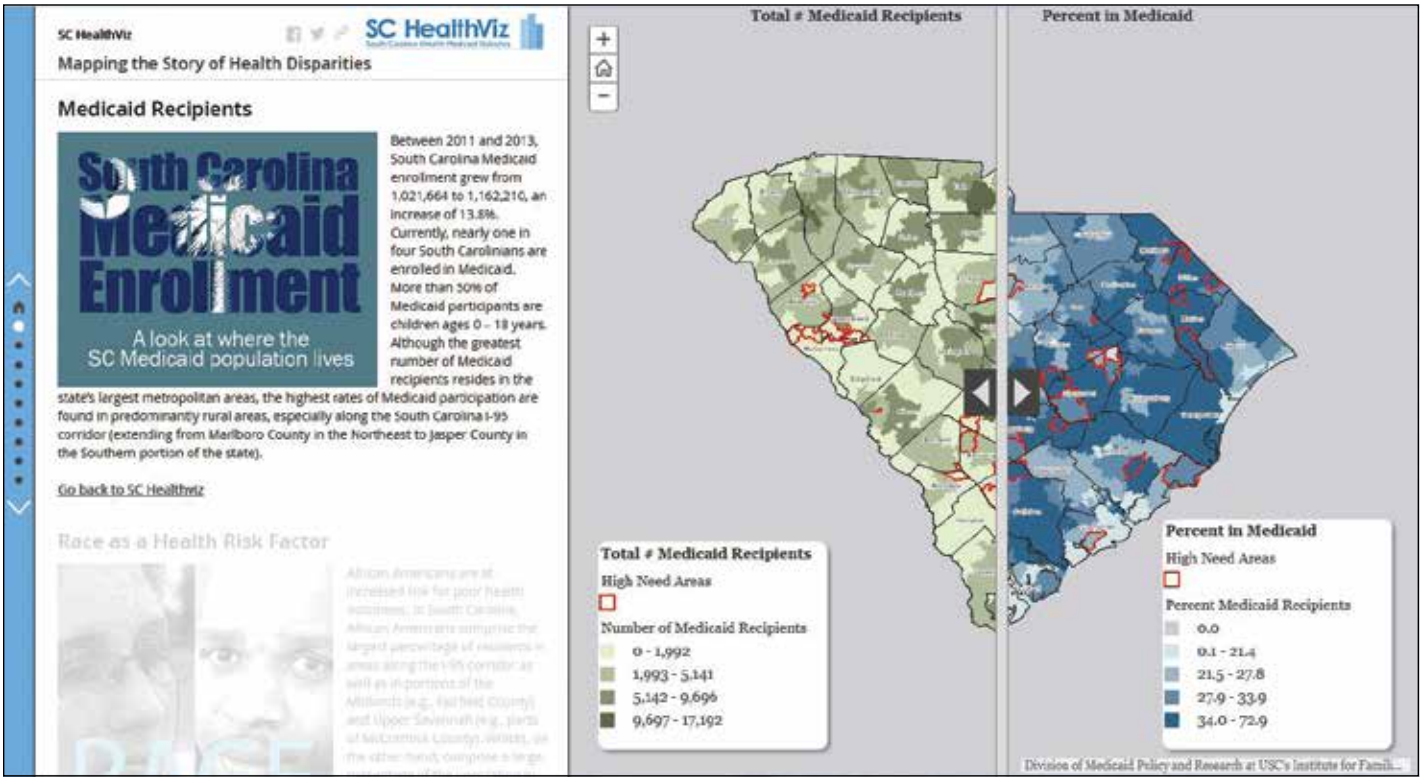
The following five story maps illustrate some of the ways GIS is modernizing and transforming health throughout the world.

Mapping the Story of Health Disparities

Everyone deserves to be healthy. Unfortunately, factors such as race/ethnicity, gender, socioeconomic status, and geographic location can prevent people from getting the care and resources they need. Unequal differences in health status and gaps in care, known as *health disparities*, put vulnerable populations at a higher risk for preventable diseases and health conditions.

This map highlights the geographic disparities in health status among South Carolina Medicaid enrollees. It shows the spatial association between unequal access to life-enhancing resources and inconsistent health outcomes among state Medicaid participants.

View the live map at esriurl.com/healthdisparities.

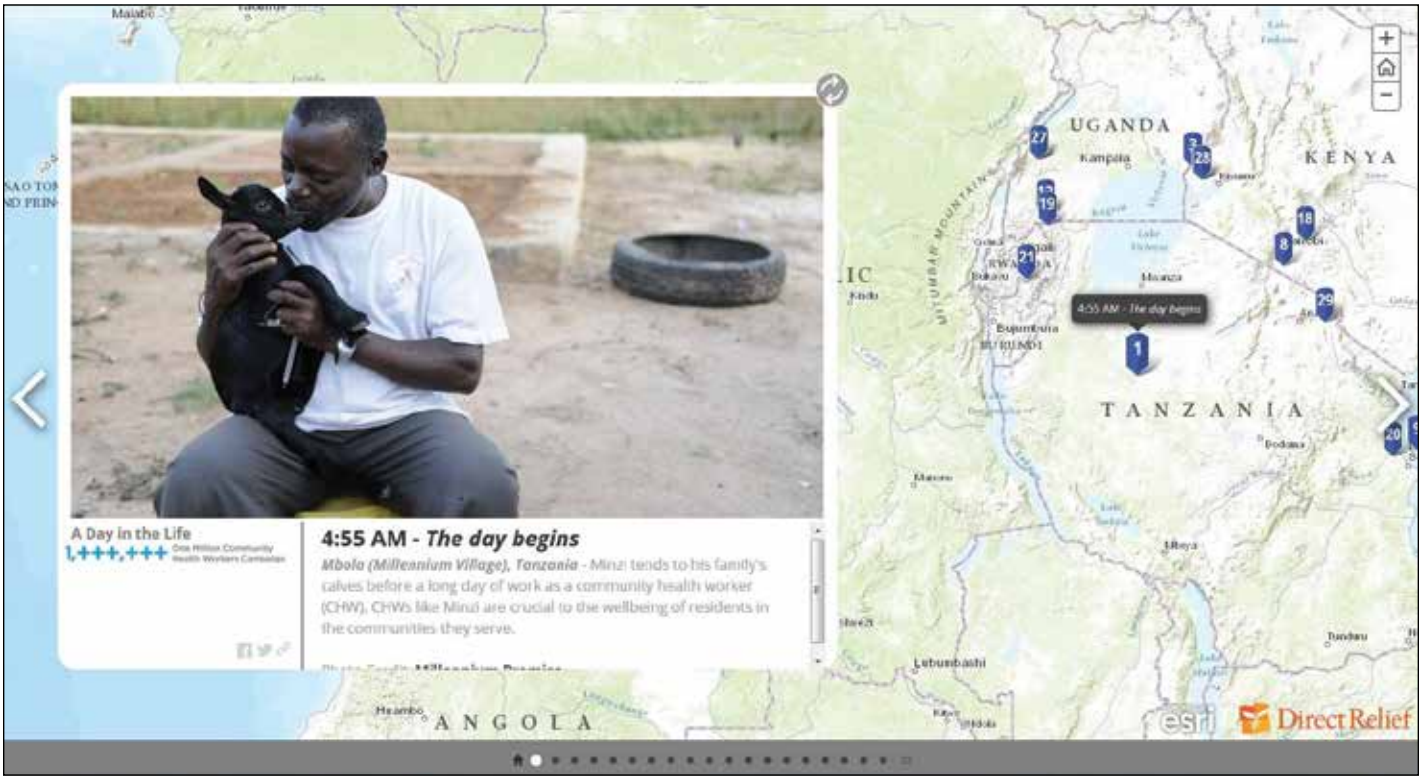


A Day in the Life: Snapshots from 24 Hours in the Life of Community Health Workers

In dozens of countries, tens of thousands of individuals rise each morning; travel miles over rough terrain; and provide primary health care in some of the world's most remote, vulnerable, and hard-to-reach places. At any given moment, these real-life heroes, known as Community Health Workers (CHWs), are monitoring Ebola virus contacts, counseling an HIV-positive person, surveying basic health needs, or helping a newborn at risk for pneumonia.

A Day in the Life: Snapshots from 24 Hours in the Life of Community Health Workers is the latest story map in the One Million Community Health Workers campaign. This map provides a guided, 24-hour tour of 29 CHWs in action across 13 countries in sub-Saharan Africa. Navigate this story map to discover the significance of CHWs' missions and the lives they improve.

View the live map at esriurl.com/chws.



The Key to Energy Conservation and Food Security

Earth's growing population means more mouths to feed and greater demands on the planet's limited resources. But by going back to basics, farmers can produce traditional foods with less energy use—and boost global food security at the same time.

Traditional Food Can Save Energy, Boost Food Security is an interactive story map from National Geographic that takes you on a world tour of the origins of traditional foods. From corn to coffee, learn about the history of today's dietary staples and how they can be produced more efficiently, enhancing food security for all populations.

View the live map at esri.url.com/foodsecurity.

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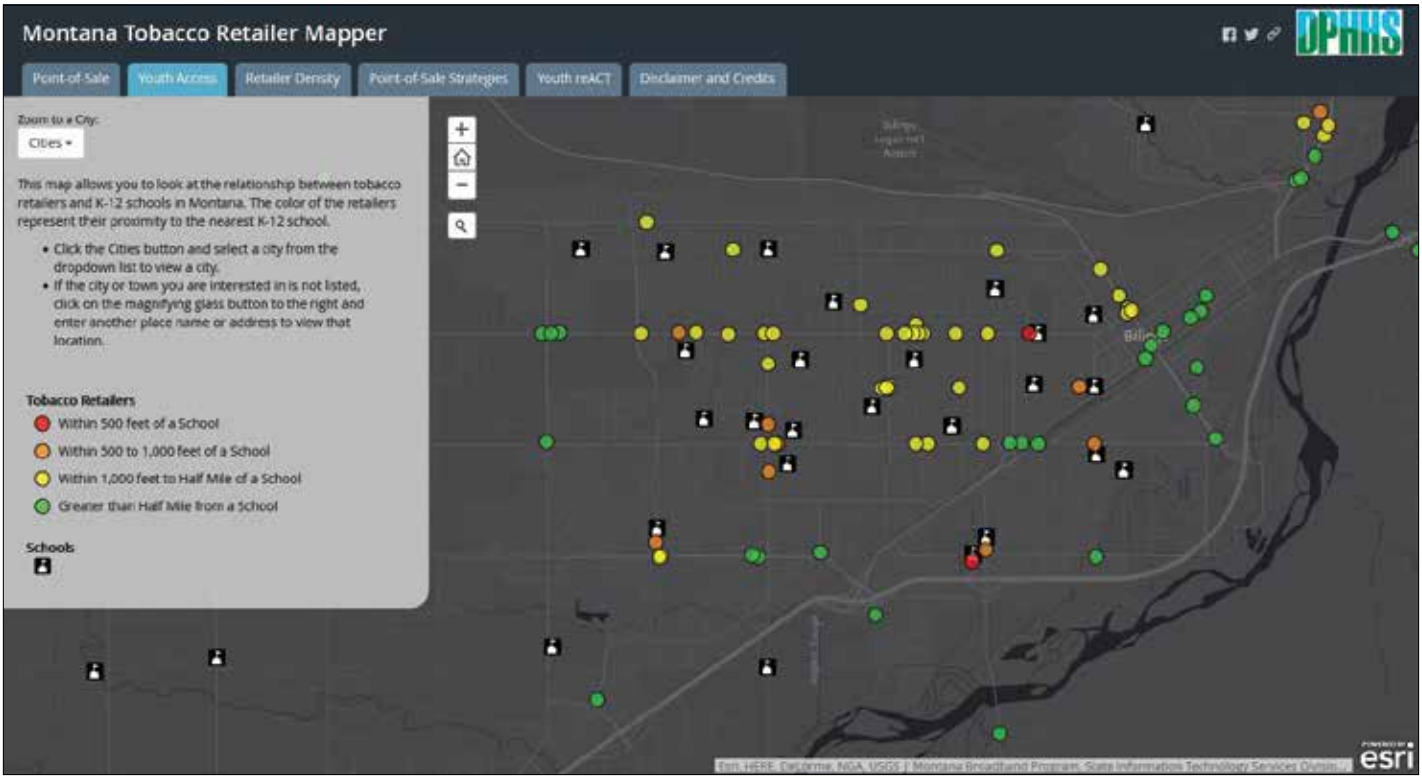
Preventing Tobacco Use in Montana

Big tobacco can't advertise on TV. Or billboards. Or newspapers. Or magazines. Instead, tobacco companies spend $7.8 billion in the retail environment. The Tobacco Use and Prevention Program of the Montana Department of Public Health and Human Services developed the Montana Tobacco Retail Mapper story map to show what's in store for the state's youth.

This interactive map explores retail point-of-sale issues relating to youth, demonstrates the relationship between tobacco retailers and K–12 schools, and exposes the density of tobacco sales in political jurisdictions.

View the live map at esriurl.com/montanatobacco.

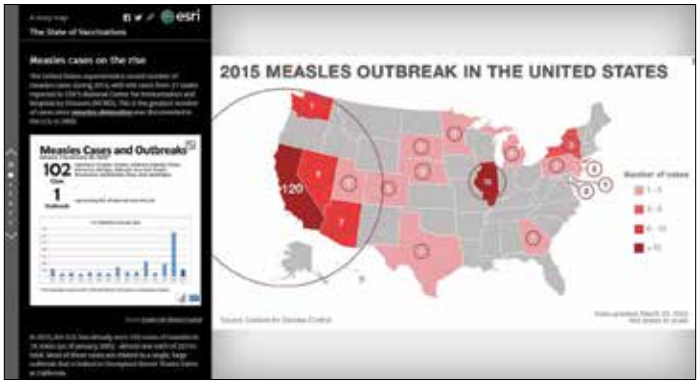


From Measles to Mumps— Where Does Our Nation Stand?

The recent outbreak of measles in California sparked a national debate, prompting lawmakers to reexamine bills on immunization and the purported reasons to claim exemption to immunization.

The State of Vaccinations story map reviews details about each state's vaccination rate, potential changes to legislation, and more.

View the live map at esri.url.com/vaccinations.



Tell Your Story

Do you have a story to tell about the health of your community? Learn how you can harness the power of maps at storymaps.arcgis.com.

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Top 10 Reasons to Share Your Data with ArcGIS Open Data

Releasing your open data means much more than making a file download site to meet government transparency requirements.

Publishing your data as open data supports making your community and the whole world a better place to live. Open data enriches programs and applications created by software developers. It stimulates local, regional, national, and international economies. Open data is being used to eradicate polio and combat the Ebola virus. Open data helps scientists and researchers better understand the universe and make life better for all of us.

ArcGIS Open Data is an Esri-hosted and managed solution included with ArcGIS Online. Using this solution, you can set up, within minutes, your own public-facing website to share your open data. Here are the top 10 reasons why you should share your open data with ArcGIS Open Data.

1. Most Data Is Spatial

Most data has at least one geographic component—even budget data that belongs to a specific geographic location or region. Using ArcGIS Open Data, you can easily share all your spatial data, as well as your nonspatial data, and optionally indicate an administrative region.

2. You'll Share Living Data

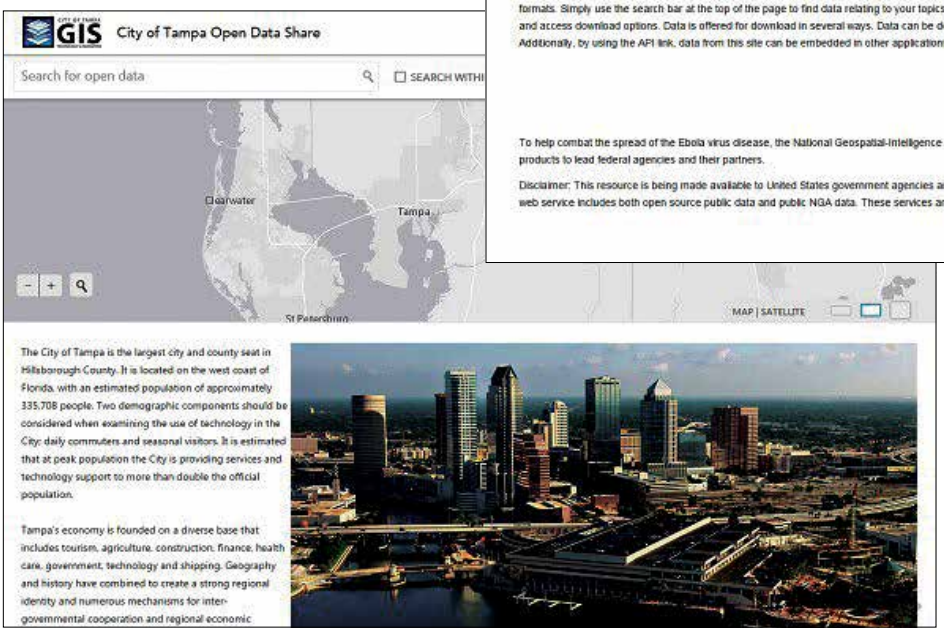
ArcGIS Open Data not only lets you download the raw data but also provides dynamic access via a REST API. This enables you to build apps, conduct GIS analysis, and integrate resources dynamically to ensure that you are always using the most current and authoritative data.

3. You Can Share Data from the Source

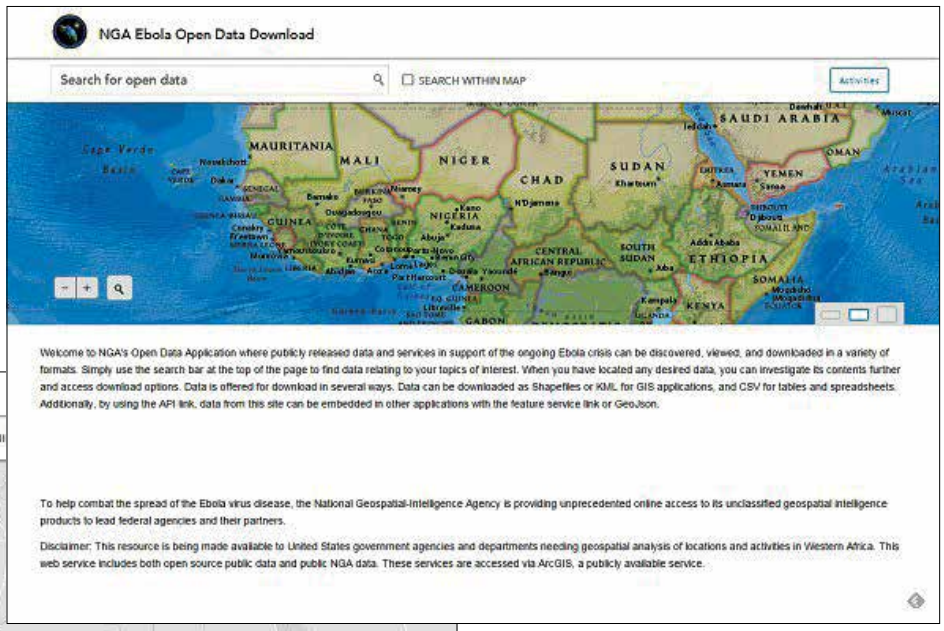
You can leverage your existing data management workflows and knowledge to share the most current and authoritative version of your data. Whether the data is stored in ArcGIS Online, served from ArcGIS for Server, or hosted independently, ArcGIS Open Data connects directly to the data source.

4. You'll Be Able to Integrate Other Open Data Sources

Using an open-source project from Esri called Koop, hosted on GitHub, you can integrate data from any API on any open data platform.



↓ The City of Tampa Open Data Share site took only a few days of design and development and has no custom coding.



↑ The National Geospatial-Intelligence Agency (NGA) uses ArcGIS Open Data to help combat the deadly Ebola virus.

5. You Get to Publish Your Data Widely

ArcGIS Open Data supports the Data Catalog Vocabulary (DCAT) open standard specification for connecting open data sites with many other open data platforms and search engines. This allows you to easily integrate the datasets you share with ArcGIS Open Data to other open data platforms, such as CKAN, OpenSearch-Geo, AtomPub, Microdata, or your own custom-built site.

6. You Can Fully Brand and Customize Your Site

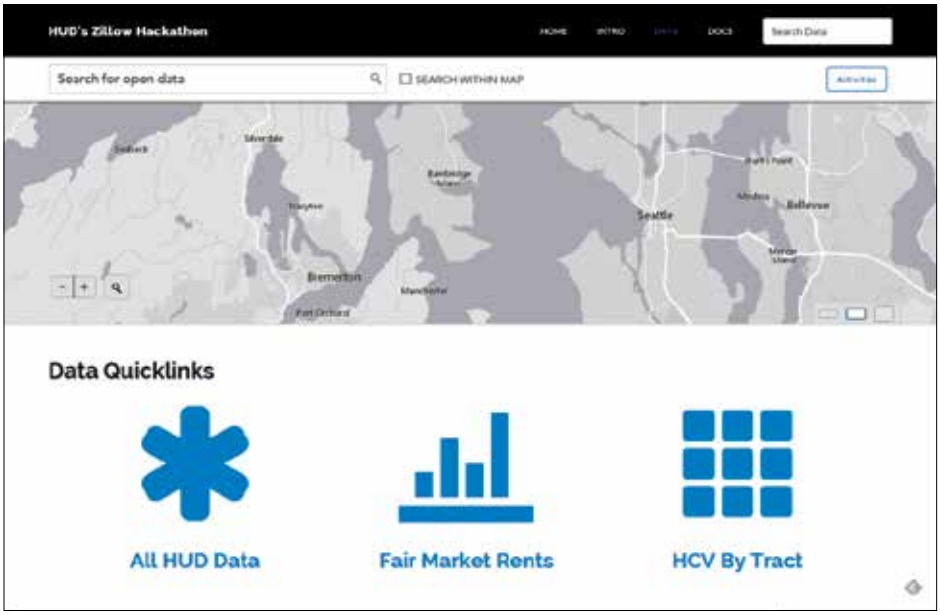
You can customize your ArcGIS Open Data site to match the look and feel of your organization's website. The visual editor makes it easy for you to get started with a site, and you have full control to further customize the site using a common HTML and CSS framework. You can also set a custom domain URL to truly make your open data site an extension of your existing web presence.

7. You Get to Speak Your Language

In addition to English, ArcGIS Open Data supports native localization for 25 different languages at no additional cost. ArcGIS Open Data supports Chinese (simplified Han), Czech, Danish, Dutch, Estonian, Finnish, French, German, Greek, Italian, Japanese, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese (Brazil), Portuguese (Portugal), Romanian, Russian, Spanish, Swedish, Thai, Turkish, and Vietnamese.

8. You Can Publish Multiple Sites

There is no limit to the number of datasets or open data sites that you can publish with ArcGIS Open Data. You can publish one site with your public services data; another one with your park data; and a third master site that shares all your data. You can also publish sites in multiple languages. You can create all these sites for free.



↑ ArcGIS Open Data shares your data directly from the source so you're always publishing the most current and authoritative data.

↑ ArcGIS Open Data supports native localization for more than 20 different languages, including Japanese.

9. You'll Join an Open Data Community

You can use ArcGIS Open Data to instantly and automatically connect with the large and growing community of more than 800 published open data sites in ArcGIS Online. You will join a network of authoritative open data that is helping to stimulate economies and foster knowledge around the world. Your open data will also be accessible for people to find and make connections across many open data sites simultaneously.

10. You Probably Already Have ArcGIS Open Data

ArcGIS Open Data is included with ArcGIS Online. It is part of a platform of mobile, desktop, web, and open-source applications. If you have an ArcGIS Online subscription, you have ArcGIS Open Data at no additional cost.

If you don't already have ArcGIS Online and want to see how easy it is to share your open data, sign up for a free trial.

Visit esri.com/openhealth to get started with ArcGIS Open Data.

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Special thanks go to our sponsors for bringing together health and human services attendees at the Esri User Conference, held July 20–24, 2015, in San Diego, California.

Congratulations to the 2015 Special Achievement in GIS Award Winners

Esri honored health and human services organizations for geographic innovation at this year's Esri User Conference. Congratulations to the winners of the Special Achievement in GIS (SAG) Award for demonstrating vision, leadership, and hard work in their use of the ArcGIS platform.

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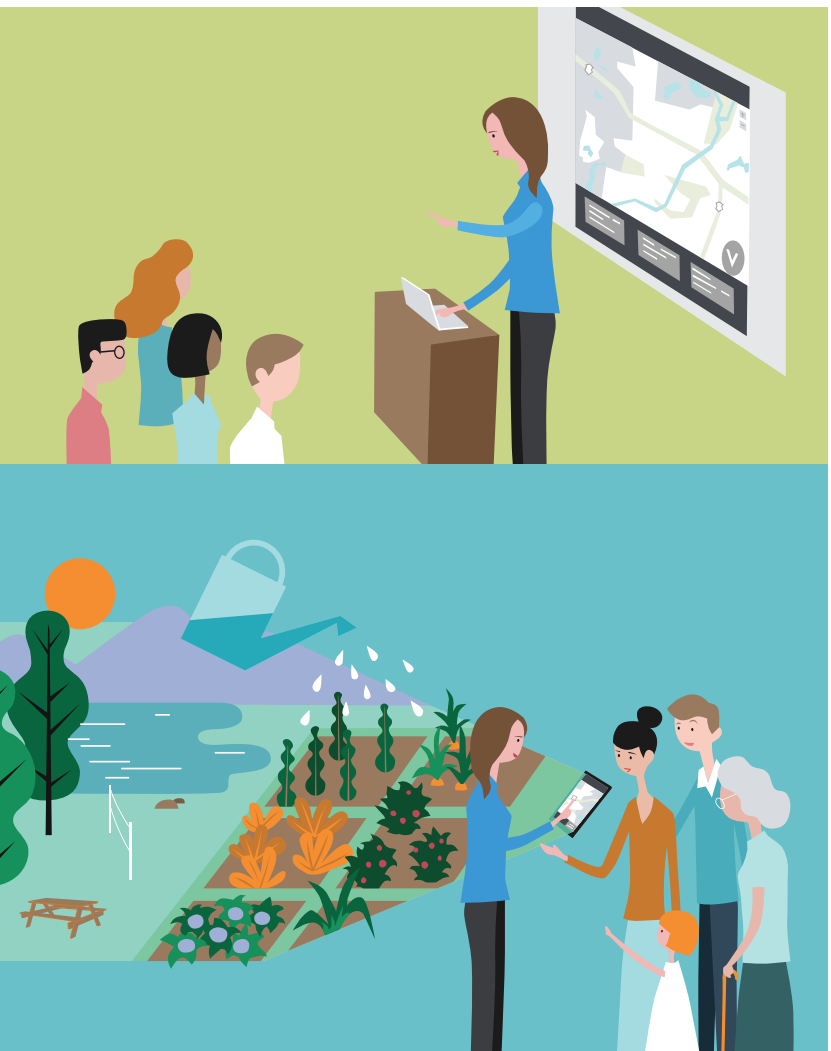

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