Case Study

A Conceptual Rendering of One Type of Protected Bike Lane

HEALTHY COMMUNITIES

User

Klamath County, Oregon

Challenge

To improve Klamath County's low health ranking

Solution

Used ArcGIS® software to identify where disease and the lack of walkability are correlated and to plan where to administer intervention activities

Results

Identified where interventions were most needed and proposed the location for a new walking and biking path

Creating a Healthier Klamath County

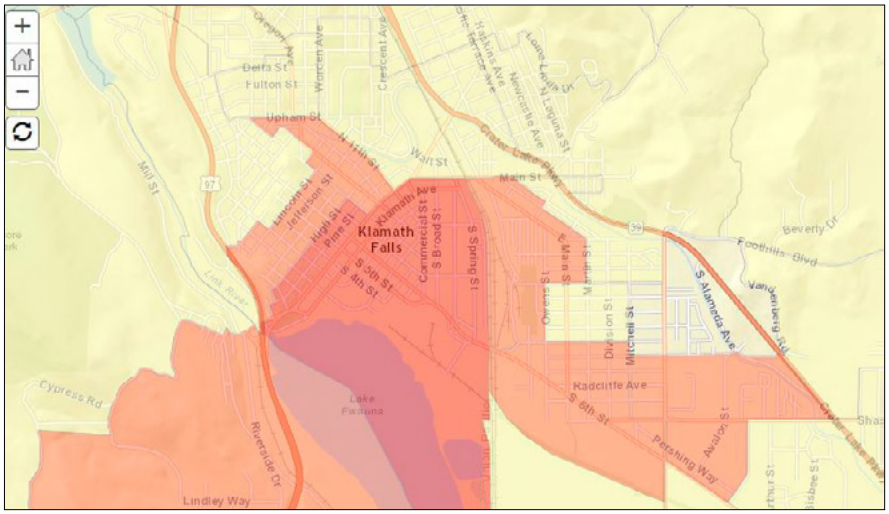
Finding out that your county is second to last in the 2016 county health rankings for Oregon can be sobering. So Healthy Klamath, a coalition of community health partners, decided to take action to improve the health of Klamath County by turning to the geographic information system (GIS) personnel from the Oregon Institute of Technology (OIT).

The Challenge

Public health advocates realized that they needed to increase Klamath County's overall health ranking score, but they wanted to implement targeted interventions where they were most needed. An opportunity to make these improvements came about through the work of Healthy Klamath and the Blue Zones Project, which works to increase life expectancy and quality of life. With the help of Dr. John Ritter from OIT, the team wanted to find geographic areas that had high incidences of certain chronic diseases and poor health outcomes. With a grant from the Cambia Health Foundation, the team used GIS technology to see whether these disease occurrences were related to neighborhood walkability, demographics, or both. The goal was to use spatial analysis to help direct resources for intervention efforts, and the GIS team ran with it.

The Solution

The team began by creating a walkability model using Esri® ModelBuilder™ with data such as local slope, population density, and road density—six variables in total. The team also worked with Sky Lakes Medical Center and Sky Lakes Wellness Center to receive 60,000 de-identified patient records from 2012, sorted



Hot Spot Analysis for Obesity Within Census Block Groups in Klamath Falls, OR.

"ArcGIS has made it possible not only to see what is happening in the community but plan and place resources where they are needed the most."

Dr. John Ritter
Oregon Institute of Technology

into several disease categories including diabetes, incidence of stroke, and obesity. The data was then aggregated into 2010 US Census block groups within the study area.

Ritter and the team started producing incidence density maps for each disease category. Using ArcGIS℠ Online, a web app was created to show how the spatial distribution of walkability correlated with the identified disease categories. ArcGIS Online allowed the maps to be viewed by multiple organizations simultaneously, enabling them to see progress and provide feedback quickly and effectively.

Next, the team added data for population density, race, average household income, age, and other variables obtained from the 2010 US Census. This was done to see whether there were any connections between the identified diseases' incidence and walkability, demographics, or other diseases.

The Results

Many connections between the demographic variables and the occurrence of the identified diseases were confirmed, but some relationships were stronger than others. Where there was a high incidence of hypertension, there was an increase in the rate of heart disease. Also, where there was a high incidence of heart disease, a low walkability score and below-average household income were apparent.

In Klamath Falls, the team also found an outlier region for high diabetes incidence in a neighborhood just north of downtown and a cluster of high values for diabetes immediately south of the downtown area. There was also a hot spot of obesity diagnoses in the downtown area. These analyses showed that mitigation efforts were needed for the extended downtown area. Consequently, a pathway consisting of a protected bike lane and sidewalk was proposed to connect a local city park to downtown, traversing the regions with some of the highest incidences of poor health conditions. This pathway will give residents access to active transportation and exercise resources. The hope is that the incidence of obesity and diabetes in this region will decline, thereby improving the health of residents in Klamath Falls.

The city council approved the proposal, and the construction of the pathway will begin in 2017.

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