NATIONAL ASSOCIATION OF
CHRONIC DISEASE DIRECTORS
Promoting Health. Preventing Disease.

Generate-Educate-Activate-Respond (GEAR)

GEAR Group 1: "Understanding Chronic Disease Data and Methods for Communication Impact"

GEAR Group 1 Product:

Data Visualizations Resource Guide

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Background

Generate, Educate, Active, Respond – Group One - "Understanding Chronic Disease Data and Methods to Communicate Impact"

In 2016, the National Association of Chronic Disease Director invited state health department chronic disease and health promotions staff to apply for a leadership development, mentoring and learning opportunity called the Generate, Educate, Activate, and Respond (GEAR) Groups. GEAR Groups are part of a new NACDD program established to provide learning incubators on various crosscutting topics of interest for advancing leadership and mentoring as well as opportunities for networking among state public health professionals. GEAR Groups differ from communities of practice as they are tasked with developing a product that serves to advance not only the participating states, but all states in that particular topic area.

NACDD created the following five GEAR Groups:

- GEAR Up for Understanding Chronic Disease Data And Methods for Communicating Impact
- GEAR Up for Community Benefit
- GEAR Up for Understanding Healthcare Payment Reform
- GEAR Up to Communicate the Value of Public Health
- GEAR Up for Health Equity

Topic areas were developed based on discussions with NACDD members. GEAR Groups are aligned with the association's strategic priorities--leadership and management skills in state public health, partnering with health care, and explaining data, evidence and value. Membership in the GEAR Groups was limited to the first nine applicants who qualified to participate. Membership was limited in order to build trust and rapport among members and provide all with an opportunity to be a full-fledged participant of the GEAR Group. Participants were not requested to be an expert in desired GEAR Group topic area to apply for participation

GEAR Groups have served as a venue for problem solving and peer-to-peer sharing and learning opportunities focused on crosscutting issues across the four CDC Domains. GEAR Groups provided six hours of in-depth learning over a six-month period beginning in February 2016. GEAR Groups provided opportunities for members to share best practices with each other on program implementation and integration.

NACDD GEAR Group 1 Members

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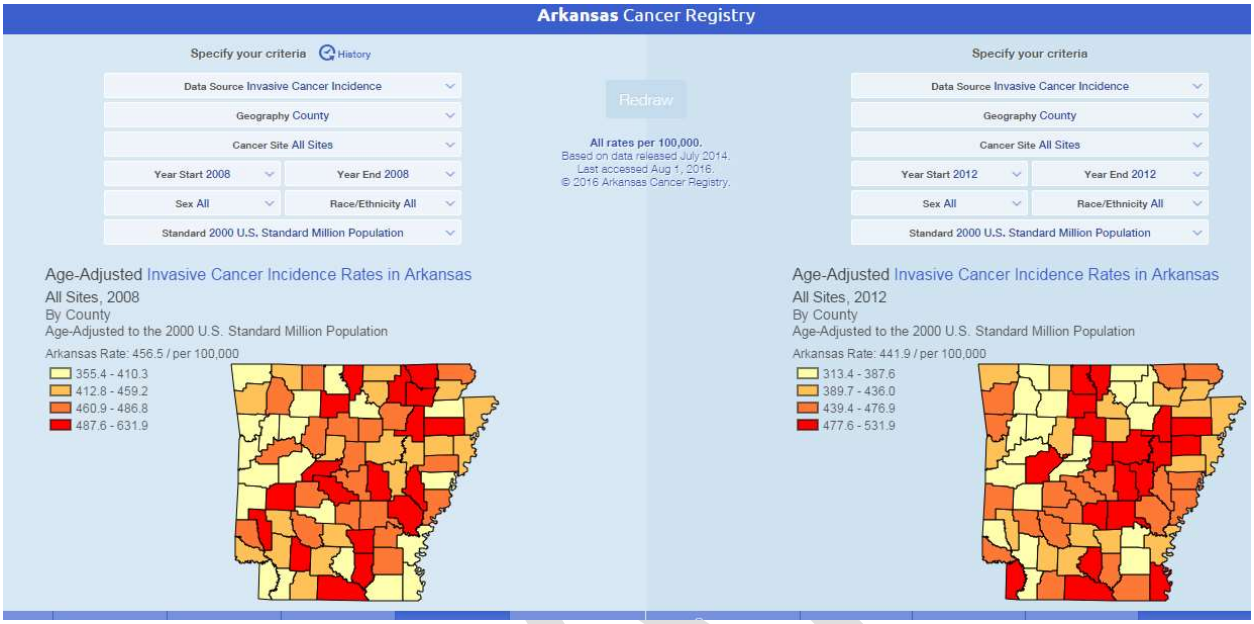
GEAR Group 1 Product

As a result of the GEAR Group 1 Community of Practice work, a data visualization resource guide, featuring state examples and resouces on software, blogs and books, was created to support continued learning in understanding methods for communicating chronic disease data.

State Example

Arkansas



Title: “Arkansas Central Cancer Registry”

Narrative and Background: The mission of the Arkansas Central Cancer Registry is to serve the public by collecting, analyzing, researching and disseminating quality cancer data to help describe the burden of cancer, so evidence-based cancer prevention and control programs can be implemented to reduce cancer incidence and mortality in Arkansas.

Data Sources used: AR Cancer Registry data.

Intended audience*:* General public, researchers, health departments, cancer prevention programs.

Software used: Outsourced to Kentucky Cancer Registry (KCR); Cancer CORE.

Staff involved: AR Department of Health Systems Programmer and other AR Central Cancer Registry staff, and Kentucky Cancer Registry Staff.

Approval Process: North American Association of Central Cancer Registries (NAACCR).

Cost/Resources/Effort: LOW **MEDIUM** HIGH
Medium; approx. $6,000 per year.

How was data disseminated to audience? Online.

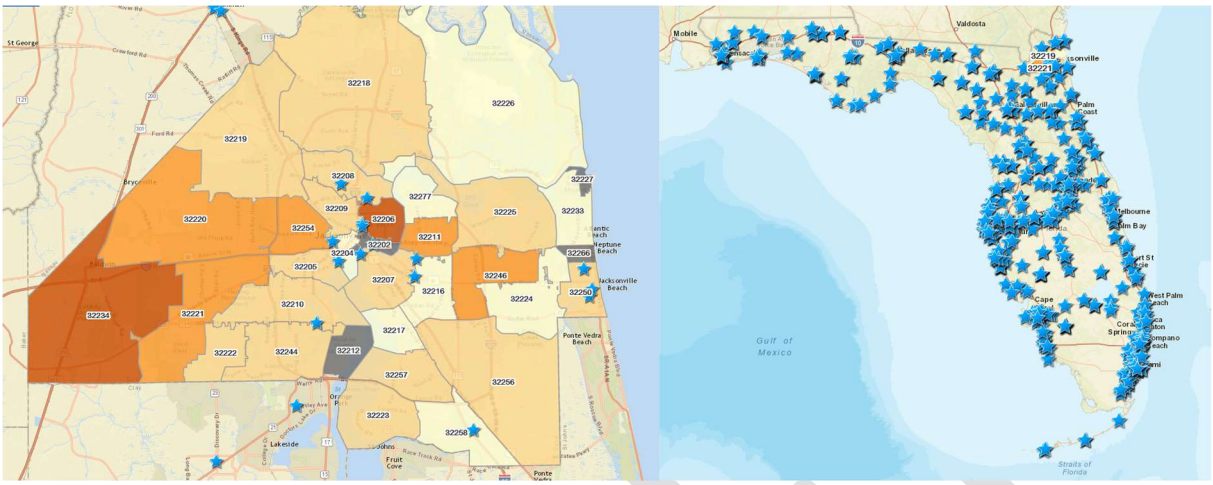
Was usage tracked? If yes, how? Yes, KCR provides secured web-based access to usage statistics.

Case Study Conclusions: This data visualization product is an effective tool and should be continued.

Link(s): www.healthy.arkansas.gov and www.cancer-rates.info/ar

State Example

Florida



Title: "Maps of Late Stage Cancer Incidence and Cancer Screening Provider Locations in Florida"

Narrative and Background: An Access to Care Community of Practice (CoP), made up of a diverse body of navigation health professionals, identified several opportunities to increase cancer screenings through provider outreach. To guide outreach, the CoP developed a comparative screening reference guide for physicians and patient navigators highlighting similarities and expanded definitions of breast, cervical, colorectal, lung and prostate cancer screening guidelines for major recommending bodies. Using ArcGIS mapping software, Florida late stage incidence data was used to map statistically significant differences and identify areas that would benefit most from support. Cancer screening providers were also mapped using an internal source of service providers. The joint map of incidence and providers was modified to allow broad access and use through a public website domain. Tools were added to the map to enhance usability and easier data analysis.

Data Sources used*:* Florida Cancer Data System, internal provider data, United States Census.

Intended audience: Health providers, clinical and community based navigators, programming and planning groups.

Software used: Extracted late-stage cases from Florida Cancer Data System registry dataset with SAS. Output SAS data to Excel and imported into ArcGIS.

Staff involved:

- Cancer epidemiologist - gathered late stage incidence trend data and conducted statistical analysis
- Colorectal Cancer Control Program Director, Breast and Cervical Cancer Early Detection Program Data Manager, and external navigation partners - provided cancer screening provider data
- Comprehensive Cancer Control Program Coordinator - cross referenced and verified screening provider and mapped provider locations

Approval Process: Content was routed through the Florida Department of Health and in total was a seven month project from concept to dissemination. The process involved a variety of stakeholders and aimed to have a broad reach.

Cost/Resources/Effort: LOW MEDIUM HIGH
Cost: Low
Resources: High
Effort: Medium

How was data disseminated to audience?
Cancer trend data and provider maps were made available through ArcGIS Online and shared with a Community of Practice interested in increasing access to cancer care through data driven initiatives. Future health care provider outreach will encourage organizations to review and help maintain contact information.

Was usage tracked? If yes, how?
Website analytics provide daily view counts.

Case Study Conclusions:
Several counties were identified as higher than the state. Provider locations indicate possible transportation limitations for individuals in high risk regions through improved transportation. Next steps will include volunteer recruitment to validate and verify the large data set of provider data and creating networks for primary care providers to engage with screening providers.

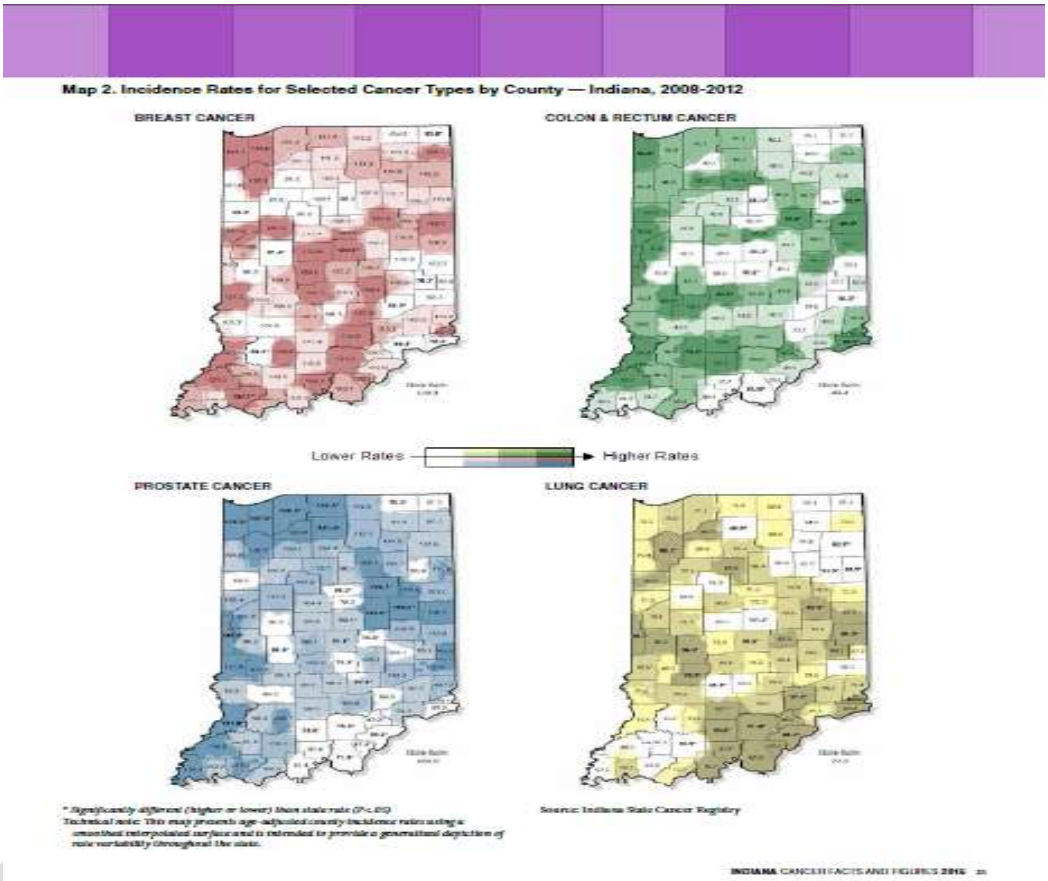
Suggested Resources:
ESRI (http://www.esri.com/) provides online trainings and learning communities to help new and growing GIS users improve their maps.

Community Commons (http://www.communitycommons.org/) is a free GIS mapping tool which has basic functions and archives user submitted maps.

Link(s): None

State Examples

Indiana



Title: "Incidence Rates for Selected Cancer Types by County"

State/Program: The Cancer Control Section at the Indiana State Department of Health

Narrative and Background: Traditional methods of reporting cancer incidence rates to the public generally use county geography. These rates are typically accompanied by a choropleth map, which categorizes each county relative to all other counties. This familiar and conventional visualization of data tends to promote counties as distinct, isolated entities. Regional collaboration opportunities may not be fully realized, thus marginalizing cancer control efforts for a county's population. Mapping

county rates using an interpolation technique instead offers a fresh view, removing geographic boundaries from the process.

Counties are represented by either a population-weighted centroid point, or a group of tract centroid points within a geographic information system (GIS). These “sample” points are assigned a county rate. An inverse distance weight (IDW) interpolation method is applied to the points generating a raster surface. The raster values are then reclassified and converted to vector graphics for easier distribution through user-friendly web mapping interfaces.

Visual interest gained by offering gradational shading draws attention to populations most in need of interventions aimed at reducing cancer incidence. Entities working to reduce incidence rates can target resources and health promotion efforts in an equitable manner toward areas of need. Additionally, this method supports the development of collaborative efforts that span county boundaries and encourages the pooling of limited resources.

Data Sources used*:* Indiana State Cancer Registry (ISCR)

Intended audience*:* The Indiana Cancer Consortium (ICC), region-specific coalitions and other partners, including hospitals, academic institutions and governmental agencies.

Software used: GIS, Oracle, and Rocky Mountain Cancer Data System.

Staff involved (roles/skills): GIS Director, ISCR Staff, Cancer Epidemiologist, and ICC Director.

Approval Process*:* Less than one month for approval. Mapping process one week.

Cost/Resources/Effort: LOW MEDIUM HIGH
This was low cost to the health department due to using internal, full-time staff to complete.

How was data disseminated to audience?
The ICC uses the map enhancements to create an interactive web page. In addition, the state of Indiana utilizes the enhancements in many publications and presentations including the *Indiana Cancer Facts and Figures* report.

Was usage tracked? The ICC tracks these products through internal evaluation systems. Google Analytics is used to monitor all ICC website traffic, including downloads of the Indiana Cancer Facts and Figures publications and page views on all mapping and visualization tools. These findings are sometimes reported in the ICC Annual Report or in funder reports. Additionally, the ICC Evaluation Committee surveys all ICC members on how well the ICC is delivering timely and relevant cancer data. The survey also evaluates ICC members' awareness of the Indiana State Cancer Registry.

Case Study Conclusions:
Visual interest gained by offering gradational shading draws attention to populations most in need of interventions aimed at reducing cancer incidence. Entities working to reduce incidence rates can target resources and health promotion efforts in an equitable manner toward areas of need. Additionally, this method supports the development of collaborative efforts that span county boundaries and encourages the pooling of limited resources. Next steps include adding more information (statistical findings and complete streets initiatives) to the interactive maps.

Suggested Resources:
ArcGIS mapping software and software that pulls data from the ISCR.

Link(s):
ICC Website: http://indianacancer.org/wp-content/uploads/2015/06/Indiana-Cancer-Facts-and-Figures-2015_web-Tables_Charts.pdfhttp://indianacancer.org/wp-content/uploads/2015/06/Indiana-Cancer-Facts-and-Figures-2015_web-Tables_Charts.pdf

State Example

Louisiana

Title: "Using Social Math to Promote Healthy Living in Louisiana"

State/Program: Louisiana Department of Health's Bureau of Chronic Disease Prevention and Health Promotion.

Narrative and Background: Bureau's Mission: Connecting Louisiana Communities to a Healthy Future.Louisiana Department of Health launched a statewide health promotion initiative in April 2014. Through this initiative we aim to create a statewide community-based network through a public brand, Well-Ahead Louisiana, which promotes health in all places and spaces, connecting people to the resources that will make healthy living easily accessible to each and every person.

Data Sources used*:* BRFSS, RJW County Health Rankings, State-level: Youth Tobacco Survey, Adult Tobacco Survey, and Youth Risk Behavior Survey.

Intended audience*:* Media & Press; Diverse Louisiana Populations; Non-traditional Partners to Health; Larger Presentations to Mixed Audiences.

Software used: SAS, GIS, MS Office, In-Design/Adobe Suite.

Staff involved:

- Communications Coordinator: Language/Editor
- Director: Vision casting
- Epidemiology Team: Provision of data
- Program Staff: Complete Social Math Equations

Approval Process*:* LDH Communications Bureau approval, minimal time required

Cost/Resources/Effort: LOW MEDIUM HIGH
Low cost for Social Math

How was data disseminated to audience?
Community PowerPoint presentations
Radio Interviews and Press Releases

Was usage tracked? If yes, how?
Not formally, tracked via number of events used.

Case Study Conclusions:
To make this effort a success, begin with identifying a person who is creative and has decent math skills to develop your cheat sheet. Ensure they have easy access to your epidemiology team. Then develop a cheat sheet that includes the talking points and the equations.

Create a list of social math data sources and familiarize yourself with the associated numbers. To begin, choose one issue to start with and have that person develop your social math cheat sheet within the next two weeks. Make sure to create value by researching what resonates with your target audience.

Lastly, find ways to ingrain the use of social math in your team's approach to public engagement.

Suggested Resources:
None

Social Math Samples

Using the Steps:

1) Choose a Topic:

   Obesity

2) Identify Data Sources:

   BRFSS, Google or Wikipedia Search, Google Maps

3) Identify Value/Reference Sources:

   Demonstration of Scale using School Bus, Length and Mall

4) Write the Equations:

# of children in LA who are obese or overweight/# of children who fit on a school bus = # of buses

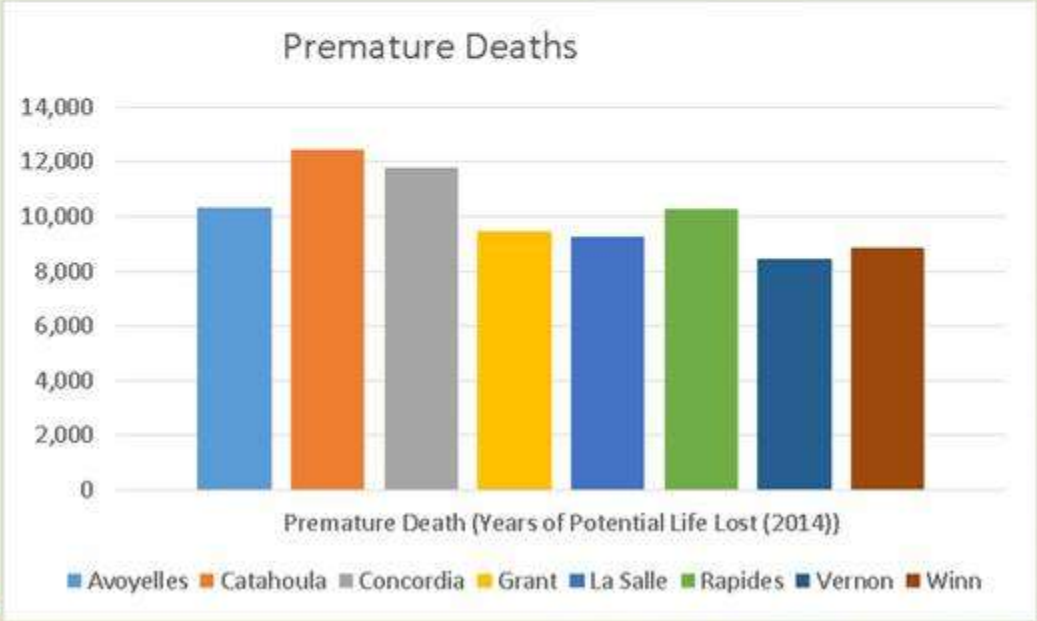
DESCRIBING THE CHALLENGE

The estimated number of children under the age of 5 who are obese or overweight fill more than 1,600 school buses

Those buses would stretch more than 11 miles, if lined up end to end

Data Bar Graphs to Social Math

REGION VI (Central Louisiana)
Premature Deaths: 80,920 1079 entire average lifespans



State Example

New York

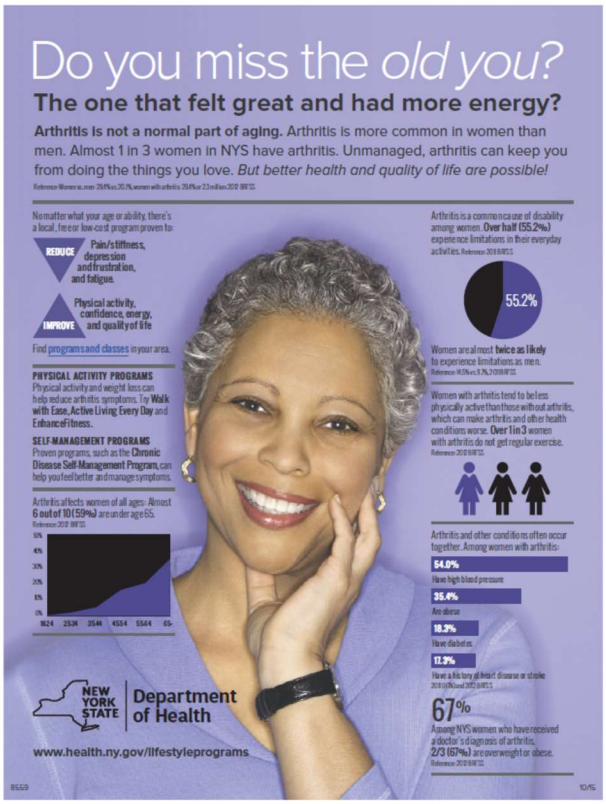


Figure: A picture of the infographic developed on Arthritis. The key messaging includes data on arthritis prevalence, and other statistics to engaged the target audience (women ages 40 to 65) to consider physical activity and self-management programs

Title: "Developing an Arthritis Infographic"

State/Program: New York/Bureau of Chronic Disease Evaluation and Research/Bureau of Community Chronic Disease Prevention – New York State Arthritis Program (NYS AP).

Narrative and Background: A deliverable of the NYS AP's cooperative agreement with the Centers for Disease Control and Prevention (CDC) is to develop arthritis-related data products and disseminate them to stakeholders and other partners statewide. As a way to diversify the types of products disseminated, the NYS AP requested the development of an infographic-style, one-page publication that would highlight the program's key messaging on arthritis prevalence and engage the target audience

(women ages 40 to 65) to consider physical activity and self-management programs to better manage their arthritis symptoms.

Data Sources used*:* The 2011 and 2012 NYS Behavioral Risk Factor Surveillance Data.

Intended audience*:* Caucasian and African-American women with arthritis (ages 40-65 years), as part of an evidence-based self-management program digital campaign

Software used: SAS – to analyze BRFSS Data; MS Office Suite**;** Adobe – InDesign, Photoshop; Illustrator; and Quark

Staff Roles/Skills:
Data Analyst (Research Scientist) – Analyzed BRFSS Data and developed key statistics to incorporate as content
NYS AP Coordinator – content expert on Arthritis and key messaging
Bureau of Marketing and Creative Communications/Public Affairs group (Multiple Staff) - expertise on marketing/creative design; Dissemination of product on social media/web
Bureau Directors/Division Administration/Center for Community Health Administration – Approvals

Approval Process*:* Approximately 6 months for content development; approximately 6 months in approvals, and to be designed in-house marketing and design team

Cost/Resources/Effort: choose one: LOW **MEDIUM** HIGH

How was data disseminated to audience? Print (400 copies)/Social Media (Facebook and Twitter)/Internet (NYSDOH Website)/List-servs (Chronic Disease, Local Health Departments, Public Health Professionals, Area Agencies on Aging)

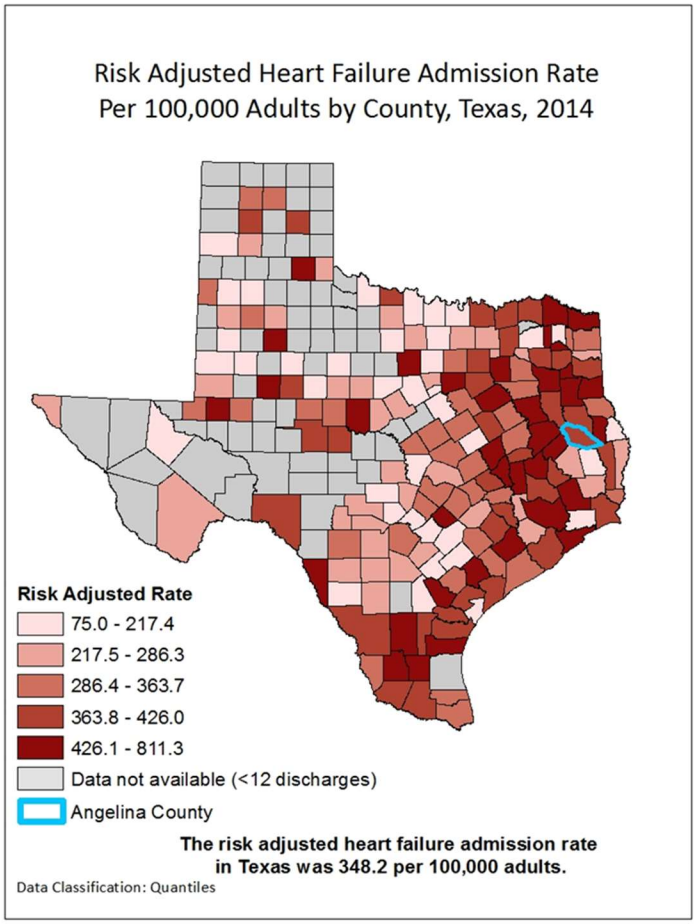
Was usage tracked? If yes, how?: Likes/Shares on Facebook; Retweets on Twitter; Page views on NYSDOH page

Case Study Conclusions:
This data visualization product was the first chronic-disease related "infographic" produced by the Bureau of Community Chronic Disease Prevention/Bureau of Chronic Disease Evaluation and Research. Because it was the first product of its kind, the staff involved had to work closely together to develop a process for developing content and visualizations. To develop the product, a variety of staff and expertise were needed. After the product was disseminated, positive feedback was received and supported the notion that more chronic disease-related data products geared toward lay audiences were needed. Since, another infographic on physical activity and disability has been developed and additional infographics are in the planning phases.

Link(s): https://www.health.ny.gov/publications/8559.pdf

State Example

Texas



State/Program: Texas/Office of Surveillance, Evaluation, and Research; Health Promotion and Chronic Disease Prevention Section

Narrative and Background: Potentially Preventable Hospitalizations (PPH) are hospital admissions for certain acute illnesses and chronic conditions that may be avoided with appropriate outpatient treatment and disease management. Lack of access to healthcare and poor-quality care lead to increases in these types of hospitalizations.

Methodology to identify PPH was developed by the Agency for Healthcare Research and Quality (AHRQ). The hospitalizations are geographically

identified by the patient's county of residence. PPH conditions are identified by their primary diagnosis in the hospital. The most common chronic conditions that result in preventable hospitalizations are: angina, congestive heart failure (CHF), hypertension, chronic obstructive pulmonary disease (COPD) and asthma in older adults, diabetes short-term complications, and diabetes long-term complications. The most common acute illnesses that result in preventable hospitalizations are: bacterial pneumonia, dehydration, and urinary tract infection (UTI).

County community partners included 13 rural small counties with high PPH rates in Texas. A full report was created which presented analyzed adult PPH data for all of Texas, and individual reports were created for each of 13 funded counties. Nine select PPH conditions were included in the reports, for community partners to use to identify targeted interventions. The reports may be used as tools to identify at risk populations and conditions, to better target interventions for PPH conditions within the communities. This information is not meant to be used as an evaluation of particular hospitals or other healthcare providers.

Data Sources used*:* Texas Hospital Inpatient Discharge Public Use Data File, 2014.

Intended audience*:* Community county partners.

Software used: SAS, MS excel, GIS

Staff involved:
Epidemiologist
Epidemiologist Team Lead
Manager
Program Coordinator

Approval Process*:* It took us about five months to plan and create framework for the reports, analyze the data, create the maps, design the report layout, and write the overall Texas report and each of the 13 county-specific reports. The reports were reviewed and input were included from the staff mentioned above. The manager approved the final reports.

Cost/Resources/Effort: choose one: LOW MEDIUM **HIGH**

How was data disseminated to audience? The program coordinator delivered copies of the overall Texas report and a county-specific report to each of the 13 funded counties during the site visits. PDF versions of the reports were also shared via email with the funded counties and other interested partners.

Was usage tracked? If yes, how? Not specifically. However, the program coordinator reported that the funded counties were very satisfied with the reports and will use them in their work to target interventions in their communities.

Case Study Conclusions: Going beyond using tables, maps and charts were the data visualization methods used, as they are user-friendly tools for communities. It would not add value to have all three methods above for all the variables, but for some crucial variables such as race/ethnicity, it is helpful to have both tables and figures.

Next Steps

• Incorporate the percentage of each PPH condition that has a secondary diagnosis of mental illness or substance abuse.
• Include more data visualizations, specifically the bar charts to compare demographics of PPH conditions and county population that include age groups and gender.
• Develop benchmarks for condition-specific risk adjusted rates that allow for comparisons between the benchmark and county-level data.

Suggested Resources:

1) PPH Program at Texas Department of State Health Services. (http://www.dshs.state.tx.us/ph/)
2) Prevention Quality Indicators, Agency for Healthcare Research and Quality. (http://www.qualityindicators.ahrq.gov/modules/pqi_resources.aspx)

3) Texas Hospital Inpatient Public Use Data File (PUDF), Texas Health Care Information Collection, Center for Health Statistics. (http://www.dshs.state.tx.us/thcic/hospitals/inpatientpudf.shtm)
4) Centers for Disease Control (CDC). (http://www.cdc.gov/)

Data Visualizations Resource List

Software

Statistical Analysis Systems
SAS: http://www.sas.com/en_us/home.html
SPSS
SQL Developer
R:https://www.rstudio.com/

Geographic information systems
ArcGIS:http://www.esri.com/
MapInfo: http://www.pitneybowes.com/us/location-intelligence.html?tab2

Data Visualization Tools
Tableau: http://www.tableau.com/
https://public.tableau.com/s/

Instructional Guides

ESRI (http://www.esri.com/) provides online trainings and learning communities to help new and growing GIS users improve their maps.

Community Commons (http://www.communitycommons.org/) is a free GIS mapping tool which has basic functions and archives user submitted maps.

http://www.vizhealth.org/

http://www.sas.com/en_us/insights/big-data/data-visualization.html

Books

https://www.sas.com/store/prodBK_66550_en.html
https://www.sas.com/store/prodBK_63855_en.html

Blogs

http://blogs.sas.com/content/graphicallyspeaking/
http://blogs.cdc.gov/nchs-data-visualization/category/data-systems/
http://blogs.cdc.gov/nchs-data-visualization/category/data-systems/