Mapping Heart Disease, Stroke and Other Chronic Diseases: A Program to Enhance GIS Capacity within Health Departments

Map Highlights from State Health Departments: Hawaii, Maryland, Minnesota, and New York; and Thematic Training: Arkansas, California, Minnesota, and Montana.

Submitted to the US Centers for Disease Control and Prevention, Division for Heart Disease and Stroke Prevention, and the National Association of Chronic Disease Directors

Prepared by the Children’s Environmental Health Initiative, Rice University, February 2018
GIS Surveillance Training Project

Geographic Information Systems (GIS) offer powerful tools for enhancing the ability of health departments to address the public health burden of heart disease, stroke, and other chronic diseases. In order to build the capacity of health departments to utilize GIS for the surveillance and prevention of chronic diseases, the Division for Heart Disease and Stroke Prevention at the National Centers for Disease Control and Prevention (CDC) funds a collaborative training project with the National Association of Chronic Disease Directors (NACDD), and The Children’s Environmental Health Initiative (CEHI). The central objective of this GIS Surveillance Training Project is to enhance the ability of health departments to integrate the use of GIS into daily operations that support existing priorities for surveillance and prevention of heart disease, stroke, and other chronic diseases. Staff members from health departments receive training regarding the use of GIS surveillance and mapping to address four major purposes:

- Documenting geographic disparities
- Informing policy and program decisions
- Enhancing partnerships with external agencies
- Facilitating collaboration within agencies

In 2017, the following state health departments were competitively selected to participate in this GIS Surveillance Training Project: State Health Departments: Hawaii, Maryland, Minnesota, New York.

The project is intentionally designed to develop a GIS infrastructure that can serve a vast array of chronic disease areas, yet with a focus on heart disease and stroke. The following maps displayed in this document highlight examples of how each participating health department produced maps to support their chronic disease priorities by documenting the burden, informing program and policy development, and enhancing partnerships. The extent of collaboration among chronic disease units within each health department is evident in the diversity of the teams that participated in the training and have continued to work to strengthen GIS infrastructure within their respective health departments.
Key Points

- Through the Centers for Disease Control's Cooperative Agreements, 1305 and 1422, the Hawai'i State Department of Health (DOH) has developed the Choose Healthy Now (CHN) program, which aims to increase awareness and availability of healthier food and beverages across the state.

- Additionally, the 1422 Cooperative Agreement supports efforts to increase the availability of chronic disease prevention and self-management programs, such as the Diabetes Prevention Program (DPP) and Self-Measured Blood Pressure Monitoring (SMBP), in nine communities across the state.

- To promote mutual reinforcement across strategies in 1422, it is necessary to intentionally reinforce lifestyle change and support healthy eating behaviors among patients enrolled in Diabetes Prevention Programs (DPP) and Self-Monitoring Blood Pressure Programs with healthy food environments. This map can help guide Choose Healthy Now programmatic efforts, by identifying areas of need for additional implementation.
High Blood Pressure among Hawai‘i’s Priority Populations* and Choose Healthy Now Locations

Key Points

- Hawai‘i’s priority populations for CDC’s 1422 Cooperative Agreement are Native Hawaiians, Filipinos, other Pacific Islanders, and/or low income adults.
- Through the 1422 grant, Hawai‘i is working to identify adults with undiagnosed high blood pressure in the priority populations and to increase access to healthy foods, through the Choose Healthy Now (CHN) project, in nine target communities throughout the state.
- This map shows both the progress Hawai‘i has achieved and the areas where additional CHN locations are needed to support adults in the target communities with self-reported high blood pressure.

*Native Hawaiians, other Pacific Islanders, Filipinos, and/or low income adults

**Crude prevalence of self reported high blood pressure

Data Source: Hawai‘i Health Data Warehouse, Hawai‘i Department of Health, Behavioral Risk Factor Surveillance System (BRFSS), [2011, 2013, 2015].
Baseline Colorectal Cancer Screening Rates by Community for the Hawai’i Cancer Program’s 2016-2020 Strategic Plan

Colorectal Cancer Screening Rates, Ages 50-75
- Below HP 2020 Target (43.4% - 70.5%)
- Met HP 2020 Target (70.5% - 79.9%)
- Met Hawaii’s Strategic Plan Target (>80%)
- Not Reportable*
- No Data

Key Points
- The US Preventive Services Task Force (USPSTF) recommends all adults between 50-75 years of age be screened for colorectal cancer. Healthy People 2020 (HP2020) set a national colorectal cancer screening target of 70.5%.
- In 2015, Hawai’i reached the 70.5% statewide target for colorectal cancer screening rates, and increased its statewide 2020 target to 80.0%.
- This map examines colorectal cancer screening rates by community, illuminating several communities with disproportionately low screening rates, particularly on neighbor islands, Kaua’i and Moloka’i.
- This map is being used to inform the Hawai’i House Concurrent Resolution (HCR) 129 workgroup about the geographic distribution and extent of disparities in colorectal cancer screening in Hawai’i. This map will help focus resources and future interventions on areas with low screening rates.

*Data is not reportable if the unweighted total responses for a community is <50 or if the relative standard error is >0.3.

Cardiovascular Disease Mortality Rates and 45-minute Drive Times to Stroke Center Hospitals

Cardiovascular Disease Deaths per 100,000 (All Ages, 2007-2013)

1.1 - 169.9
170.0 - 206.6
206.7 - 234.2
234.3 - 1830.2
Non-reportable
45 minute drive
Designated Stroke Centers

Key Points

☐ This map examines cardiovascular disease mortality rates by census tract and identifies locations of designated primary and comprehensive stroke centers. Drive time analysis was conducted to show regions that fall within a 45-minute drive time to a stroke center.

☐ Several census tracts in the highest quintile of cardiovascular disease mortality rates are located on neighbor islands (Hawai‘i (Big Island), Moloka‘i, and Lana‘i) with no access to a stroke center. Even on Oahu with three designated stroke centers, there are several census tracts with high mortality rates that fall outside the 45-minute drive time range.

☐ This map will be useful to identify areas that are lacking resources to properly treat persons who have had a stroke.

Data Sources: Hawaii Health Data Warehouse, Hawaii State Department of Health, Office of Health Status Monitoring, Vital Statistics and United States Census Bureau, American Community Survey
Facilitating Collaboration Within State Health Departments

The GIS Surveillance Training Program was intentionally designed to develop a GIS infrastructure that would facilitate collaboration among an array of chronic disease units within each health department, yet with a focus on heart disease and stroke. To that end, the staff members from each health department that participated in the training represented different chronic disease units. Each health department was led by a member of the heart disease and stroke unit (bold). The following lists the chronic disease units that were represented in each of the participating health departments:

### Hawai’i State Department of Health

<table>
<thead>
<tr>
<th>Name</th>
<th>Chronic Disease Unit</th>
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</thead>
<tbody>
<tr>
<td>Alexis Barnett-Sherrill</td>
<td>Chronic Disease Management Branch</td>
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<tr>
<td>Toby Beckelman</td>
<td>Primary Prevention Branch</td>
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<tr>
<td>Amber Bowie</td>
<td>Surveillance, Evaluation, and Epidemiology Office</td>
</tr>
<tr>
<td>Vanessa Buchthal</td>
<td>Chronic Disease Prevention and Health Promotion Division</td>
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<tr>
<td>Lance Ching</td>
<td>Surveillance, Evaluation, and Epidemiology Office</td>
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<tr>
<td>Julia Chosy</td>
<td>Hawai’i Health Data Warehouse</td>
</tr>
<tr>
<td>Lehua Choy</td>
<td>Chronic Disease Prevention and Health Promotion Division</td>
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<tr>
<td>Joshua Holmes</td>
<td>Surveillance, Evaluation, and Epidemiology Office</td>
</tr>
<tr>
<td>Meghan McGurk</td>
<td>Chronic Disease Management Branch</td>
</tr>
<tr>
<td>Blythe Nett</td>
<td>Primary Prevention Branch</td>
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<tr>
<td>Danielle Schaeffner</td>
<td>Chronic Disease Prevention and Health Promotion Division</td>
</tr>
<tr>
<td>Ranjani Starr</td>
<td>Chronic Disease Management Branch</td>
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<tr>
<td>Leslie Yap</td>
<td>Primary Prevention Branch</td>
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<tr>
<td>Kendall Zukeran</td>
<td>Surveillance, Evaluation, and Epidemiology Office</td>
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### Maryland Department of Health

<table>
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<tr>
<th>Name</th>
<th>Chronic Disease Unit</th>
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<tbody>
<tr>
<td>Alicia Vooris</td>
<td>Center for Chronic Disease Prevention and Control</td>
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<tr>
<td>Elizabeth Funsch</td>
<td>Center for Chronic Disease Prevention and Control</td>
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<tr>
<td>Erica Smith</td>
<td>Center for Chronic Disease Prevention and Control</td>
</tr>
<tr>
<td>Lisa Gardner</td>
<td>Center for Cancer Prevention and Control</td>
</tr>
</tbody>
</table>
PARTICIPATING HEALTH DEPARTMENTS TO DATE

State health departments that have participated
State health departments yet to participate
Clusters of local health departments that have participated

Alaska
Hawaii

100 Miles
500 Miles

500 Miles

100 Miles

Miles
USING GIS AND MAPS FOR HEART DISEASE AND STROKE SURVEILLANCE

The CDC Division for Heart Disease and Stroke Prevention provides a number of useful tools and resources for using maps and GIS to address geographic disparities in heart disease and stroke. Learn more about this work here: https://www.cdc.gov/dhdsp/maps/.

BUILDING GIS CAPACITY FOR CHRONIC DISEASES

This project builds GIS capacity within state and local health departments for the surveillance and prevention of heart disease, stroke and other chronic diseases.

https://www.cdc.gov/dhdsp/programs/gis_training/

THE INTERACTIVE ATLAS OF HEART DISEASE & STROKE

An online mapping tool that allows users to create and customize county-level maps of heart disease and stroke, along social and economic factors and health services.

https://www.cdc.gov/dhdsp/maps/atlas

CHRONIC DISEASE GIS EXCHANGE

An online community forum for public health professionals and community leaders to learn and share techniques for using GIS to enhance chronic disease prevention and treatment.

https://www.cdc.gov/dhdsp/maps/gisx/

GIS SNAPSHOTs

Maps from many participants have been published as GIS Snapshots in CDC’s Preventing Chronic Disease Journal. Several one page fact sheets were also disseminated.

https://www.cdc.gov/pcd/issues/gis_toc.htm

MAP WIDGET FOR HEART DISEASE & STROKE

The new Map Widget allows state and local health departments and other organizations to easily display state- and county-level maps of heart disease and stroke mortality on their web sites.

https://www.cdc.gov/dhdsp/maps/hds-widget.htm