Introduction

Geographic Information Systems (GIS) are powerful tools for enhancing the surveillance, prevention and management of chronic diseases. Chronic disease professionals in health departments across the U.S. are finding ways to use these systems to advance health equity, program planning and implementation and documentation of impact. Chronic Disease prevention leaders recognize the value GIS contributes to this. Some leaders envision "a culture of GIS," in which GIS is institutionalized in health department operations. NACDD members, including Chronic Disease Directors and the Cardiovascular Health Council, developed and vetted a set of GIS Hallmarks to describe policies and processes that build GIS into the daily work of chronic disease prevention and health promotion at the state level. Taken together, these Hallmarks can address the following questions:

- What does a culture of GIS look like?
- What are policies and processes that can be implemented in a health department to support ongoing use of GIS?
- How can Chronic Disease Directors and other health department leaders sustain and expand GIS?
- In addition to staff trained on GIS software, what other elements contribute to GIS capacity?

Additionally, the GIS Hallmarks provide language that state health department staff can use to describe not only current capacity but needs and next steps for capacity development. It is our hope that the GIS Hallmarks will be useful in health departments with emerging GIS capacity, those with well-oiled systems for GIS use as part of program work, and everything in between.

The GIS Hallmarks can help health departments to set goals for GIS capacity development, build a GIS-informed workforce, improve communications with partners, provide ideas for adding GIS capacity development into strategic plans and work plans, health improvement plans, performance improvement and other critical documents that describe and define health department priorities, and consider how GIS fits with data sharing and informatics efforts.

The GIS Hallmarks

Building and Supporting a GIS-Savvy Workforce

1. Recruitment of staff with GIS skills is ongoing.
2. GIS-related skills are incorporated in employee job descriptions, applications, interviews and selections.
3. Training and professional development opportunities related to GIS are provided regularly.
4. Time is allocated/protected for GIS training and creation efforts.
5. Participation in GIS user workgroups (health department, regional, university-based, etc.) is encouraged and supported.
6. Application of and development of GIS skills is recognized and/or rewarded.

7. Learning opportunities related to understanding and using GIS products (e.g., map literacy, how/when to use maps, how to disseminate maps to inform program planning) are extended to non-GIS users, including programmatic staff and external partners.
8. GIS users are supported to pursue opportunities to share their GIS work at professional meetings, conferences, and other venues, including the CDC Chronic Disease GIS Exchange
9. Establishment of a GIS leadership position within the health department
10. Adequate and consistent administrative and financial investments are made to support staff positions and personnel dedicated to GIS. [See Section 3: Building GIS-Ready Tools & Resources (16) for GIS-related technology financial support.]

Building GIS Use into Chronic Disease Prevention Work

11. GIS data, products, and maps are routinely developed, translated, and disseminated to:
    1.1 Inform policy and program decisions, such as identifying priority populations, resources and opportunities;
    1.2 Enhance surveillance activities;
    1.3 Identify geography of health concerns that may overlap with that of partner organizations;
    1.4 Address health equity by identifying upstream factors and social determinants of health;
    1.5 Identify and expand the reach of interventions;
    1.6 Coordinate resources;
    1.7 Reduce duplication;
    1.8 Tailor interventions to the needs of the communities; and
12. GIS are leveraged to integrate examination of social determinants of health and health equity considerations in surveillance, program and policy planning and evaluation.
13. Internal and external partners and community members/leaders are routinely engaged in the development, translation and dissemination of GIS data, products, and maps stated above (11.1-11.9). Internal partners include a range of analysts, programmers, statisticians, data managers, epidemiologists, evaluators and managers.
14. The distribution of efforts/activities across small geographic areas (census tracts, block groups) is routinely identified.
15. GIS maps are discussed and used across all levels of administration and in key strategic efforts, such as the development of State Health Improvement Plans and Agency Strategic Plans

Building GIS-Ready Tools and Resources

16. Adequate and consistent administrative and financial investments are made in GIS-related technology, including hardware, software, information technology systems, licenses, training and software support. [See Section 1: Building and Supporting a GIS-Savvy Workforce (10) for staff/personnel financial support.]

17. Access to existing geospatial data or geocoded data is maintained through data use agreements or other methods.

18. Options are explored to address unmet GIS data needs through means such as data use agreements with partners.

19. Systems, processes, or protocols are in-place/implemented for streamlining/standardizing the development, translation and dissemination of GIS data, products, and maps. Systems, processes, or protocols include:

    9.1 Determining suppression criteria,

    9.2 Age standardization procedures,

    9.3 Geocoding approaches,

    9.4 Map templates,

    9.5 Standardized shapefiles,

    9.6 Branding elements,

    9.7 Labeling conventions,

    9.8 Health department clearance/approval processes for GIS products and map dissemination, and

    9.9 Map request processes.

20. As needed, GIS users have access to GIS technical assistance, resources, and expertise from available sources such as internal sections/departments or state and local agencies (e.g., Dept. of Transportation, Dept. of Education, state GIS office, etc.).

21. A variety of GIS resources are routinely used, such as CDC GIS Resources, Community Commons, County Health Rankings, etc.

of Health; Vivian Lasley-Bibbs, Kentucky Department for Public Health; Robin Roberts, Michigan Department of Health and Human Services; Desiree Jonas, Florida Department of Health; Shelby Vadjunec, Wisconsin Department of Health Services; CDC Division for Heart Disease and Stroke Prevention: Michele Casper; Children's Environmental Health Initiative at Rice University: Joshua Tootoo.