

1. Project Summary

The Massachusetts Department of Public Health (MDPH) Heart Disease and Stroke Prevention and Control Program proposed to link multiple statewide datasets together to create community-level profiles. The resultant dataset creates new information that can be used to describe and better target the environments in which people with cardiovascular disease live. This “environment” refers to all things that may contribute to the precipitation of Cardiovascular Disease (CVD): the physical environment, the built environment, enacted policies, lifestyle and behavioral factors, among others. These community profiles will also contain indicators that characterize the burden of cardiovascular disease and related co-morbidities.

The “soft” linkage performed relied upon geographic identifiers, namely zip code and/or town name. Thus, the unit of analysis is a geographic unit and not a patient or person, as is common with a more conventional linkage. With geography as the basis for both linkage and analysis, the public health implications and uses grow. Spatial relationships between demographics, disease, and the built environment can be explored and population-level interventions targeted to communities or regions. Additionally, large surveillance datasets and environmental scans often cannot offer community-based organizations and health departments the local data that they need.

For effective use of limited state resources, community-specific prevalence estimates are needed to identify communities with the greatest needs. In addition, local public officials and community-based organizations increasingly request timely and community-specific data from the MDPH. Massachusetts is unique in that it is primarily communities based, consisting of 351 cities and towns (referred throughout the report as ‘towns’). More often than not, adjacent towns differ vastly by socioeconomic status and health burden, making a system based on the Commonwealth’s 13 counties ineffective. Furthermore, data displayed at the county level are less than helpful when describing populations for the purpose of targeting public health interventions. In this data linkage demonstration project, we will illustrate the utility of the integrated data that is created.

Datasets used

The **Behavioral Risk Factor Surveillance System (BRFSS)**¹ is one of six main datasets utilized in this project. A common surveillance dataset for state health departments, the BRFSS is historically an annual paper- and telephone- survey administered to a relatively large sample of Massachusetts residents. The BRFSS collects self-reported information regarding disease and risk factor prevalence, lifestyle behaviors, medication use, healthcare utilization, and demographics, among others. Data is collected from approximately 20,000 of Massachusetts’ approximately 6.5 million residents annually. In 2009, MA piloted a cell phone administration in an effort to collect a more representative sample and reach more respondents as landline telephone usage is becoming more and more exclusive to an older demographic.

The **Uniform (Inpatient) Hospital Discharge Data (HDD)**² is an administrative database submitted to the MDPH annually by hospitals. The set includes case-level (not de-duplicated patient level) data and information regarding admitting and final diagnoses, procedures performed, discharge disposition and destination, as well as cost and payer data.

Mortality Data³ includes all information present on the MA death certificate ranging from the underlying cause of death to occupation to demographic information.

Census⁴ files provide a three-fold role in this linkage pilot. First, towns’ demographic profiles were used to model the statewide BRFSS sample to create reliable town prevalence estimates for six chronic disease conditions and risk factors. Second, census population estimates by age group are the

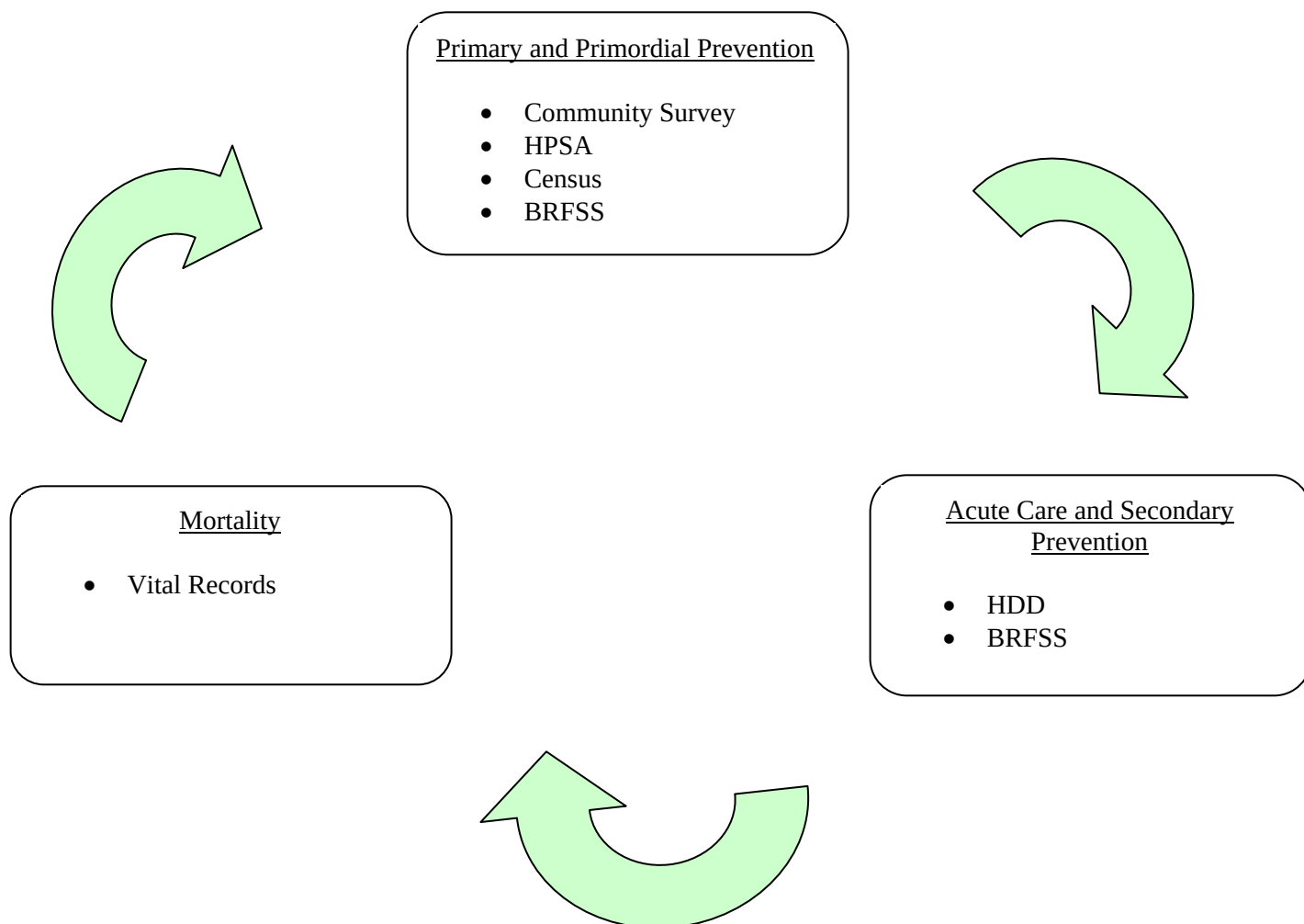
basis for age-adjustment. Third, towns' social and demographic profiles were included in the resultant dataset to serve as a source of town-specific descriptives.

The **Massachusetts Survey of Policies and Programs Related to Health for Cities and Towns (Community Survey or 'CS')**⁵ is the fifth database included in the linkage pilot. The self-reported policy and environmental scan was conducted in 2002 and again in 2007. The dataset serves as an inventory of policies and programs related to health promotion. It contains questions regarding the availability of physical activity facilities, how nutrition standards are addressed in restaurants and schools, emergency preparedness and response, local policies, regulations, and by-laws, among others. In 2007, approximately two-thirds of towns responded to the survey.

Lastly, the **Health Professional Shortage Area (HPSA)**⁶ designation data was merged into the dataset. These areas, classified by Health Resources and Services Administration (HRSA), are assigned to towns that have a shortage in any one of four areas: medically underserved, primary care, dental care, mental health care.

These datasets were chosen as a starting point for creating community profiles. Additional datasets and years of data are anticipated to be added on an ongoing basis. The dissemination and maintenance of the linked database will be detailed in Section 3. The six datasets provide considerable amounts of information that span the continuum of care for chronic diseases. Figure 1 illustrates this.

Figure 1. Framework of 2010-2011 MA-CSTE Data Linkage Project



2. Linkage Methodology

As outlined above, six Massachusetts databases were linked and the resultant dataset includes:

- 2009 BRFSS
- 2007 Uniform Hospital Discharge Data
- 2007 Mortality Data
- 2007 Census
- 2007 Community Survey
- 2010 Health Professional Shortage Area Designations

Linkages were performed at the community level (city, town, zip code) and the resultant dataset consists of 351 records, one for each of the Massachusetts towns. Data sharing agreements were obtained on an ongoing basis, as decisions to include additional databases were made. Statistical software SAS 9.1 (Cary, NC) was used for data cleaning, linkage, and analysis. Small area estimations were conducted using Stata MP 11.0 (StataCorp, College Station, TX). ArcMap 9.3 (Environmental Systems Research Institute, Inc, Redlands, California) was used for all mapping and spatial analysis.

There were four main steps in this pilot: data cleaning, data linkage, rate creation, and data analysis.

Data cleaning

Cleaning each data set was a crucial first step. The process ensured the removal of response errors (inappropriate values), standardizing of variables across datasets (spelling, formatting), as well as the reduction of biases; since respondents and/or cases were excluded based upon missing geographic identifiers, non-response bias was a particular concern. To reduce non-response bias in the HDD data, several geographically-based variables were included in the process of assigning cases to a city or town.

The first step was to create a linking variable that contains the same format and the same spelling in each data set. Three hundred and fifty one MA town names were derived from MASS.GOV website. Neighborhood information was derived from <http://www.sec.state.ma.us/cis/cisuno/unoidx.htm> and Mongabay.com (http://www.mongabay.com/igapo/zip_codes_mass.htm). Google maps were used to reference zip codes with their geographic locations. Because of variations across datasets, a single linking variable "townname" was created for each dataset. This variable contains all uppercased letters, consistent spelling, and a length of 25 bytes. The following decisions were made for cases with the following encountered barriers:

Encountered problems and subsequent decisions:

- Cases with unknown city/town names and zip codes - *Excluded*
- Cases with unknown city/town names but existing zip code - *Assigned to town based on zip code*
- Cases with city/town names were not in MA, i.e., San Francisco, MA - *Excluded*
- Cases with city/town names that exist in both MA and other states with zip code not corresponding to MA zipcode, e.g., Newton, MA 03858 (as opposed to Newton, NH 03858) – *Excluded*
- Cases with the same city/town names and neighborhood/district names in other cities/towns, i.e. Georgetown is a town but also a district in Boston (Allston) – *Assigned to town/district based on available zip code*
- Cases with similar town names but mismatched zip codes e.g. Bridgewater with East Bridgewater zip codes – *Based on zip codes (more likely to drop the “East” and have correct zip code) OR East Bridgewater with Bridgewater zip codes – Assigned based on town/city names (more likely to specifically report “East” and assign incorrect zip code)*

- Cases with other unmatched city/town names and zip codes - *Assigned based on city/town names*
- Cases with neighborhoods entered as city/town names, zip code was consistent with the town where neighborhoods located (i.e., Forestdale 02644 recoded as Sandwich, Allston 02134 recoded as Boston) - *Assigned based on zip codes*
- Cases with neighborhoods entered as city/town names and one zip code covers more than one town, e.g., Chestnut Hill covers Boston, Brookline, Newton – *Assigned to city/town with the largest population*

The second step was to recode missing data: These included towns with non-responses to CS and BRFSS (coded as “999” and towns with zero events in HDD and mortality files (coded as “0”). Variables for these “missing” towns were also coded as “999”. Furthermore, missing data in variables of interest for those respondents were coded as ‘9’;

The third step was to suppress HDD data with counts less than 7 and mortality data with counts less than 5, in conjunction with MDPH confidentiality guidelines. Data that were suppressed were coded as “999”.

After data cleaning was completed:

- The 2007 Hospital Discharge data contained 803,127 records assigned to a MA town
- The 2007 Community Survey contained 205 responses to 57 questions representing 58% of MA towns.
- The 2009 BRFSS contained 16,731 respondents residing in 342 (97%) MA towns.
- 2007 Mortality Data contained 51,595 records of MA resident deaths with an assigned town.
- The 2010 Health Provider Shortage Area data contained 102 cities/towns with a designation of Medically Underserved Areas & Populations (MUA/P), 50 cities/towns with a Primary Care Shortage designation, 65 cities/towns with a Dental Care Shortage designation, and 7 cities/towns with a Mental Health Care Shortage designation.

See Appendix 1 for the project data dictionary.

Data Linkage

Upon the completion of data cleaning, individual data were first aggregated to the town-level as counts or percentages in each data set. It is often desirable to de-duplicate hospital discharge data to transform it from an event-based to a patient-based dataset. For this purpose, however, we sought to characterize a community’s burden of any particular disease or condition; therefore, the hospital discharge data was not de-duplicated. Second, all databases were merged using the created linking variable ‘townname’. Third, calculated variables using data from different databases were created after the linkage. Finally, town-level data were linked to the BRFSS, HDD and mortality individual-level data to evaluate the effects of the community on the individual health.

Rate Creation

Small Area Prevalence Estimation

There is much information collected annually through the BRFSS that is essential to public health surveillance. Approximating this information at the local level is a significant goal of this project. Therefore, six behavioral or health indicators of high importance were chosen as part of this demonstration project. In order to obtain town-level rates for these indicators, we pooled Massachusetts BRFSS¹ data between 1999 and 2009, and applied small area estimation methods^{7,8}. Currently, BRFSS does not provide prevalence data at the town level because the majority of communities do not have

adequate sample sizes for directly calculating prevalence with reasonable precision. Small area estimation models can be adapted to overcome this limitation and provide town-level prevalence estimates.

Using the BRFSS data and small area estimation models, we estimated and analyzed geographic variations and temporal trends in prevalence of

1. Smoking
2. Obesity (Body Mass Index ≥ 30 Kg/m²)
3. Daily consumption of 5 or more servings of fruits and vegetables (5-a-day)
4. No physical exercise in the past 30 days
5. Self-reported diabetes
6. Self-reported hypertension

Small area estimation models generate community-specific prevalence estimates by making use of a) the associations of the condition/behavior under consideration with individual- and town-level characteristics, b) data from multiple years and across geographic regions, and c) community demographic characteristics. These models use the following data for the years 1999-2009: a) individual-level data on risk factors or health outcomes and sociodemographic characteristics for adults residing in the communities, b) community characteristics that are associated with the chosen indicators at least in part independently of individual-level characteristics (such as community-level per capita income), and 3) community composition by age, gender, race/ethnicity, marital status, education, and income, mirroring the individual data above.

Individual-level data

Individual-level data were obtained from the Massachusetts BRFSS collected during 1999-2009. Variables relevant to this pilot included self-reported body weight and height, current smoking status, daily consumption of 5 or more servings of fruits and vegetables (5-a-day), any physical exercise in the past 30 days, self-reported diabetes, self-reported hypertension, and sociodemographic characteristics (such as age, sex, race and ethnicity, education, marital status, unemployment, and household income). Obesity is determined as BMI ≥ 30 kg/m², calculated from self-reported body weight (in pounds) and height (in feet and inches), and corrected by self-report bias⁸. Respondents' residences have been recorded at both the town and 5-digit zip code level since 1999. Available sample sizes for the six outcome variables are summarized in Table 1 (Page 6).

Town-level data

Town-level measures include sociodemographic indicators from Census 2000, such as community compositions by gender, age group, household income, educational attainment, marital status, and employment. The data also include measures of 1) income and wealth (per capita income, percentage in poverty, median value of occupied housing units), 2) education (average years of education, percentage of degree holders), 3) occupation (percentage of blue or white-collared job holders), 4) housing characteristics (vacancy rate, percentage of home ownership, density of housing units), 5) community stability (median tenure of residency, percentage of renters, percentage of single parent families), and 6) density of tobacco outlets.

Linking town- and individual-level data

Town-level US Census 2000 data were linked with individual-level BRFSS data using unique community identification codes. Relevant individual-level variables in BRFSS databases were classified to be similar to their counterparts in Census 2000. Thus, the community-level Census data could be incorporated in the small area estimations to account for the demographic compositions of the communities.

Table 1. Sample sizes of BRFSS data by risk factor and interview year

Year	Current cigarette smoking	Obesity (BMI$\geq$30 kg/m²)	Daily consumption of $\geq$5 serves of fruits and vegetables	No exercise in the past 30 days	Diabetes diagnosed by a doctor	Hypertension diagnosed by a doctor
1999	7,249	6,826			7,277	7,221
2000	8,122	7,749	8,147	8,144	8,133	
2001	8,590	8,081		8,626	8,616	8,576
2002	7,398	7,060	7,427	7,425	7,410	
2003	7,559	7,135	7,577	7,574	7,570	7,546
2004	8,178	7,730		8,196	8,191	
2005	8,856	8,313	8,583	8,900	8,888	8,668
2006	12,660	11,891		12,714	12,709	
2007	21,420	20,323	20,962	21,495	21,477	21,426
2008	20,436	19,368		20,308	20,285	
2009	16,633	15,592	15,489	16,481	16,477	16,421
Total	127,101	120,068	68,185	119,863	127,033	62,637

Statistical modeling

Details of the statistical modeling approach have been described previously^{8,9}. The model is a two-level random effects logistic regression model. First, it estimates associations of respondents' health outcome with both individual and town-level characteristics. Second, town-level logit values are estimated based on these estimated associations and the demographic compositions of the communities, and town-level random effects. Finally, town-level prevalence estimates are obtained based on the estimated community-level logit values.

The final models included as fixed effects several individual-level characteristics, such as gender, age group, race/ethnicity, marital status, education level, employment status, and annual household income level. Missing household income and education levels were imputed using an ordinal logistic regression model accounting for personal attributes and town-level characteristics of residence. Missing values of other individual-level variables were imputed with either medians or means or the most frequent categories, as appropriate.

The final models also included selected community-level characteristics as fixed effects, such as median per capita income, percentage of blue-collar job holders, median tenure of residency, percentage of single parent families, percentage of workers walking or biking to work, and percentage of vacant housing units. Year of interview was included in the model to account for community-specific prevalence change over time. Additional town-level variations which could not be accounted for by the fixed effects and random slopes were modeled as random intercepts.

Using the model described above and the data on the sociodemographic characteristics of the communities, the community-level logit values for the six outcomes in a given year were estimated by replacing individual-level covariates with their community-level values according to Census 2000. The confidence intervals of the logit estimates were calculated using the variances of the random intercepts and random slopes. Town-level prevalence rates for the year 2009 and their associated 95% confidence intervals were obtained by exponentiating the estimated logit values and their confidence intervals.

Cardiovascular disease-related hospitalization and mortality rates

Age-adjusted rates enable comparisons between populations with differing age-distributions and allow the control of the effects of age on variables of interest while exploring other factors such as race or

gender. Here we used five age groups (0-19, 20-39, 40-59, 60-79, and ≥ 80) to adjust for the effects of age. To start, five CVD related diagnoses were analyzed. Diagnosis data were derived from the primary diagnosis (ICD-9-CM) field in the hospital discharge data and from the underlying cause of death (ICD-10) field in the mortality data. Specific ICD codes are outlined in Table 2 below.

Table 2: Cardiovascular Disease Diagnoses and Associated Codes

Diagnosis	ICD-9-CM	ICD-10
Major Cardiovascular Disease (CVD1)	390-434, 436-448	I00-I78
Diseases of the Heart (CVD2)	390-398, 402, 404, 410-429	I00-I09, I11, I13, I20, I51
Cerebrovascular Disease (CVD3)	430-434, 436-438	I60-I69
Transient Ischemic Attack (CVD4)	435	G45
Hypertension or Hypertensive Diseases (CVD5)	401-405	I10-I15

For each cardiovascular disease diagnosis, age specific rates were first calculated. Then, each age-specific rate was multiplied by age-specific weights. These weights correspond to the proportion of the MA population within each age group. The weighted rates were then summed across age groups to produce the age-adjusted rate. Rates are presented per 100,000 of the population and incorporated into the resultant dataset.

3. Data Analysis and Dissemination Plan

Sample Analysis Using Linked Database: Town-level Analysis

With the new dataset, it is possible to examine the exercise habits of adults in each town in comparison to the percent of each town's adult population that is obese and their rates of hospitalization.

Of the 351 towns, there were 328 with small area estimates of physical activity and obesity prevalence. Distributions of and correlations among these variables along with all-cause and cardiovascular hospitalization rates were explored (Table 3). Cities with higher percentages of adults reporting no exercise in the past month also had a higher percentage of adults with a BMI >30 , as well as higher hospitalization rates for all causes and for major CVD.

Table 3. Town Risk Factor Prevalence and Hospitalization Burden

	<i>Town-Specific Prevalence of "No exercise in the past month"</i>			
	<15% (n=67)	$\geq 15\%$, <20% (n=132)	$\geq 20\%$, <25% (n= 93)	>25% (n= 36)
<i>Town-Specific Adult Obesity Prevalence</i>	19.7	25.6	28.5	31.7
<i>Hospitalization Rates *</i>				
<i>All Causes</i>	9193.2	10797.3	12206.1	13715.1
<i>Major CVD</i>	1268.7	1527.2	1678.4	1823.8

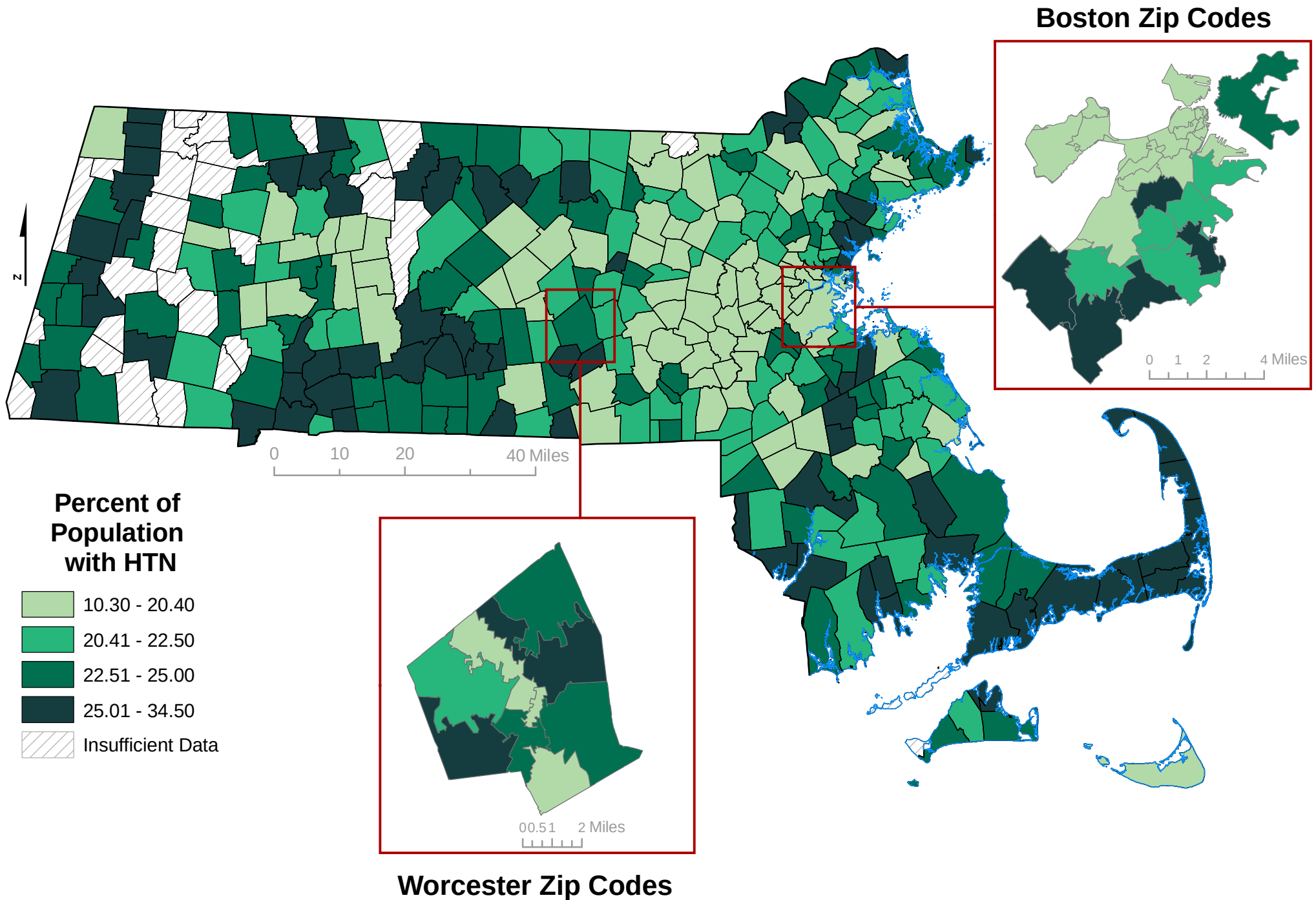
*Rates are Age-adjusted per 100,000

Sample Analysis Using Linked Database: Hotspot Identification and Analysis

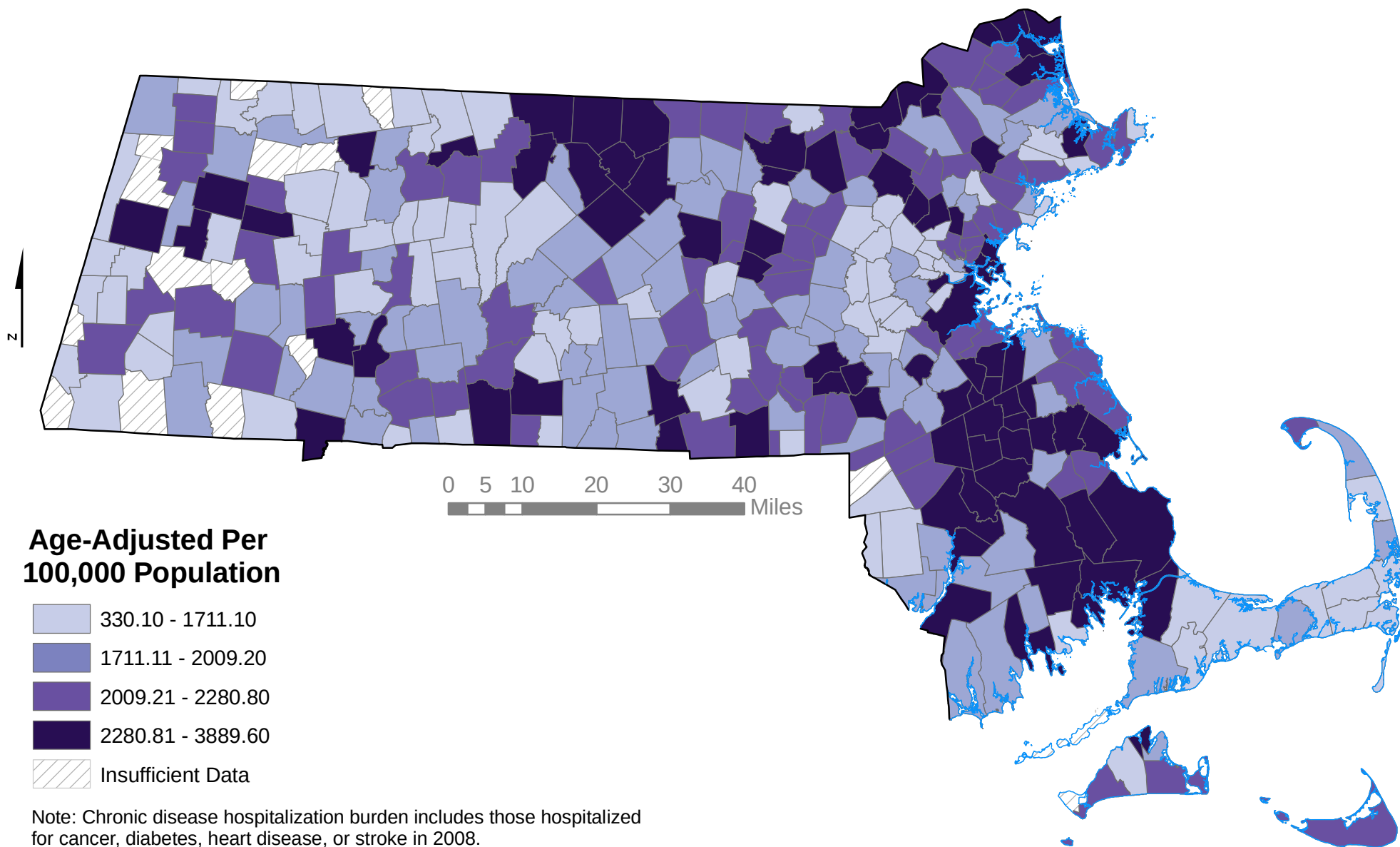
Using the newly generated town-specific estimates, hotspots of chronic disease or risk factor burden can be identified and analyzed. Small area estimates were used to create a map of hypertension prevalence across 351 Massachusetts cities and towns. Age-Adjusted percents are presented in equal quartiles. Two large urban areas, Boston and Worcester, have also been presented by zip code in order to illustrate neighborhood variations in prevalence (Map 1).

Similarly, hotspots of hospitalization rates were mapped and a Getis-Ord GI* analysis was performed to determine statistically significant clusters of chronic disease hospitalization burden. A cumulative age-adjusted rate of 2007 hospitalizations with a primary diagnosis of cancer, diabetes, heart disease, or stroke was calculated for each of the 351 Massachusetts towns and used to define the burden of disease (Map 2). The Getis-Ord GI* analysis was performed and four clusters of statistically significant burden were identified. Census attributes in the linked dataset were used to explore population size, income, and racial/ethnic characteristics of hotspots. Hospitalization hotspots were found to have significantly higher median incomes and greater total population. Future analyses will explore other indicators of chronic disease “burden” and use the characteristics of towns carrying those burdens to target public health interventions and approaches.

Map 1. Hypertension (HTN) Prevalence Across Massachusetts Cities and Towns, 2009



Map 2. Chronic Disease Hospitalizations in Massachusetts Cities and Towns, 2008



Summary

Throughout this project, MDPH was able to successfully link six databases and calculate community-specific estimates with the goal of developing community profiles for the 351 towns of Massachusetts. These profiles provide new information on aspects of the physical, behavioral, and built environment in which residents with cardiovascular disease and other chronic conditions live and allow us to explore geographic variations across a number and variety of indicators. By pooling data across multiple years and making use of the linked data sources, the small area estimation approach largely overcame the problem of small sample size that occurs when computing community-level prevalence from the BRFSS, the main source of disease and risk factor prevalence/surveillance. While cardiovascular disease is highlighted here, the methodology used will also allow for programs outside the realm of chronic disease to utilize and benefit from the data, as all causes of hospitalization and mortality were included.

As a result of the Data Linkage Stakeholder Group meetings, next steps for the further development of this data linkage demonstration have been identified and include enhancing the current linked dataset, expanding the content and years through the inclusion of additional data, and incorporating the new information created into a publicly-accessible but secure interface.

The current plan for dissemination of these community profiles is to utilize the existing application, MassCHIP¹⁰. MassCHIP is a free, downloadable program to which usernames and passwords are assigned to requesting parties. Currently MassCHIP provides the ability to generate “instant topic” (pre-determined) and custom reports from 36 health status, health outcome, and demographic datasets. There is also a mapping feature that is currently being enhanced to produce higher quality GIS products. The desire is to expand the linked dataset and add it to the current data menu in MassCHIP. Community-based organizations and leaders will then be able to easily access whole or parts of their community’s “profile”. We will also guide the development of cross tabulations that may be of interest to community stakeholders and partners.

Yet to be decided is where this dataset will exist, with what protections, and who will be responsible for its maintenance. It is our intent to address these questions in the upcoming Stakeholder Group meeting in mid-April 2011.

Summary of recommendations:

1. Re-administer the Community Survey and develop ways to increase the response from cities and towns.
2. Increase standardization of reporting of geographic identifiers, especially in the hospital discharge data, potentially through the development of a drop-down menu for use by hospital-level abstractors and coders.
3. Geocode all statewide data.

Summary of next steps:

1. Calculate additional town-level morbidity and mortality rates
 - a. Stratified rates within cardiovascular disease (e.g. rates by race, insurance type, gender)
 - b. Diagnoses outside of cardiovascular disease
2. Incorporate additional town-level morbidity and mortality rates
 - a. Age-specific rates used for age-adjustment can be included in and of themselves
3. Update and incorporate additional Census variables when the 2010 Census becomes available.
4. Calculate additional BRFSS small-area estimates for variables of interest.
5. Incorporate additional years of hospital discharge and mortality data.
6. Continue to convene the Stakeholder Group and address questions of dataset maintenance and storage.

4. Status of all project objectives

Key Objectives:

- 1) Convene stakeholder group – *Complete*
HSPC has convened the Data Linkage Stakeholder Group on February 23, 2010 and September 23, 2010. There is a third stakeholder group meeting tentatively scheduled for mid-April to discuss the expansion and maintenance of the resultant dataset. This group contains representation from MDPH chronic disease and risk factor programs such as Heart Disease and Stroke, Diabetes, Cancer, Asthma, Tobacco Control, Nutrition, Physical Activity, and Obesity, and the Wellness Unit. Other stakeholders that have attended are leadership and members of the Bureau of Health Information, Statistics, Research, and Evaluation (BHISRE), the Bureau of Healthcare Safety and Quality (BHCQ), and the Chronic Disease Community Liaisons.
- 2) Finalize administrative duties – *Complete*
Budgetary duties were completed by Kathy Foell. Tracy Evans handled receiving and sending invoices. Katrina D'Amore oversaw communication and receiving deliverables from two contractors as well as guiding the project and compiling the progress and final reports. Kathy Foell and Katrina D'Amore facilitated the stakeholder group meetings.
- 3) Conduct data linkage – *Complete*
Data cleaning, linkage, and rate creation was performed by two contractors, Penny Liu and Wenjun Li. Data access was obtained for the contractors by Katrina D'Amore. Methods described in Section 2 above.
- 4) Conduct analysis and dissemination plan – *Complete*
Analysis was performed by Penny Liu, Katrina D'Amore, and Erin Kulick (HSPC Epidemiologist). The dissemination plan was developed by Katrina D'Amore as a result of conversations with the Stakeholder Group described in Section 3 above.
- 5) Create final report and final database – *Complete*
The final report was composed by Katrina D'Amore, with methodology submitted by P. Liu and W. Li. The final database was composed by P. Liu.

¹ Massachusetts Department of Public Health, Bureau of Health Information, Statistics, Research, and Evaluation. Behavioral Risk Factor Surveillance System; 1999-2009.

² Massachusetts Department of Public Health, Division of Healthcare Finance and Policy. Uniform Hospital Discharge Data; 2007.

³ Massachusetts Department of Public Health, Registry of Vital Records and Statistics; 2007.

⁴ National Center for Health Statistics. Postcensal estimates of the resident population of the United States for July 1, 2000-July 1, 2007, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2007). Prepared under a collaborative arrangement with the U.S. Census Bureau; released August 7, 2008. Available from: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm> as of September 5, 2008. Excerpt prepared by James K. West, MDPH.

⁵ Massachusetts Department of Public Health, Bureau of Community Health Access and Promotion. Survey of Policies and Programs Related to Health For Cities and Town in Massachusetts; 2007

⁶ Massachusetts Department of Public Health, Division of Primary Care and Health Access. Health Provider Shortage Areas; 2009-2010. Original data: <http://bhpr.hrsa.gov/shortage/>

⁷ Li W, Land T, Zhang Z, Keithly L, Kelsey JL. Small-area estimation and prioritizing communities for tobacco control efforts in Massachusetts. *Am J Public Health* 2009;00(3):470-9.

⁸ Li W, Kelsey JL, Zhang Z, Lemon SC, Mezgebu S, Boddie-Willis C, et al. Small-area estimation and prioritizing communities for obesity control in Massachusetts. *Am J Public Health* 2009;99(3):511-9.

⁹ Li W, Land T, Zhang Z, Keithly L, Kelsey JL. A method for identifying high-priority communities for tobacco control efforts in Massachusetts. *American Journal of Public Health* 2007;(Manuscript under review).

¹⁰

http://www.mass.gov/?pageID=eohhs2terminal&L=5&L0=Home&L1=Government&L2=Departments+and+Division s&L3=Department+of+Public+Health&L4=Programs+and+Services+K+-+S&sid=Eeohhs2&b=terminalcontent&f=dph_masschip_g_masschip&csid=Eeohhs2

Appendix 1: Resultant Dataset Dictionary and Codes

Variables	Questions/Descriptions	Type	Format
Townname	Name of City or town	Char	All letters capital
2007 Census Data Items			
pop_total	Total number of population in 2007	Num	
pop_age1	Total number of population for aged 0~19 years in 2007	Num	
pop_age2	Total number of population for aged 20~39 years in 2007	Num	
pop_age3	Total number of population for aged 40~59 years in 2007	Num	
pop_age4	Total number of population for aged 60~79 years in 2007	Num	
pop_age5	Total number of population for aged 80+ years in 2007	Num	
pop_white	Total number of population for non-Hispanic, white in 2007	Num	
pop_black	Total number of population for non-Hispanic, black in 2007	Num	
pop_hispanic	Total number of population for non-Hispanic, asian & pacific islanders in 2007	Num	
pop_asian	Total number of population for Hispanic in 2007	Num	
pop_male	Total number of population for male in 2007	Num	
pop_female	Total number of population for female in 2007	Num	
2009-2010 HPSA Designation Data Items			
MUAP	Medically underserved areas/population	Num	1=Yes, 0=No
HPSA_PCP	Primary Care Health Professional Shortage Areas	Num	1=Yes, 2=pending, 3=No
HPSA_dental	Dental Health Professional Shortage Areas	Num	1=Yes, 2=pending, 3=No
HPSA_mental	Mental Health Professional Shortage Areas	Num	1=Yes, 2=pending, 3=No
2007 Community Survey Data Items			
Q1	Does your city or town have a Public Recreation Program?	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q2	If Q1 Yes, does the Public Recreation Program offer physical activity programs?	Num	1=Yes, 2=No, 3=DK, 99=Q1≠ Yes, 999=non-respondent
Q3	If Q 2 Yes, are these programs accessible to people with disabilities?	Num	1=Yes, 2=No, 3=DK, 99=Q2≠ Yes, 999=non-respondent
Q4	Which of the following does your city or town provide to residents?		
Q4A	On or off road bikeways	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4B	Pedestrian safety improvements	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4C	Lighting of streets with sidewalks	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4D	Public parks	Num	1=Yes, 0=No, 9=missing, 999=non-respondent

Q4E	Pedestrian crosswalks	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4F	Conservation land	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4G	Bicycle helmets, padding, or reflective materials	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4H	Sidewalks	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4I	School-based gyms	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4J	Indoor courts (tennis, basketball, etc)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4K	Outdoor courts (tennis, skateboard, etc.)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4L	Playgrounds/tot lots	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4M	Recreation fields	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4N	Don't know	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4O	Other facilities	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q4OTHER	Other-text	Char	
Q5	Other than routine maintenance, in the past fiscal year are any of the following facilities in your city or town undergoing construction in the form of additions or improvements?		
Q5A	On or off road bikeways	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5B	Pedestrian safety improvements	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5C	Lighting of streets with sidewalks	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5D	Indoor walking facilities (malls)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5E	Outdoor public courts (tennis, skateboard, etc.)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5F	Playgrounds/tot lots	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5G	Recreation fields	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5H	Sidewalks	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5I	School-based gyms	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5J	Indoor public courts (tennis, basketball, etc.)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5K	Public parks	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5L	Pedestrian crosswalks	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5M	Conservation land	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5N	Don't know	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5O	Other facilities	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q5OTHER	Other-text	Char	

Q6	Does your city or town have access to physical activity for adults/youths at any of the following types of recreation facilities?		
	For Adults:		
Q6AA	Local schools (gyms, outdoor courts/fields)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6AB	City/town owned recreation facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6AC	Universities/colleges (gyms, outdoor courts/fields)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6AD	State, county or DCR owned facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6AE	Corporate recreation facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6AF	YMCA/YWCA	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6AG	Private gyms	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
	For Youths:		
Q6YA	Local schools (gyms, outdoor courts/fields)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6YB	City/town owned recreation facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6YC	Universities/colleges (gyms, outdoor courts/fields)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6YD	State, county or DCR owned facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6YE	Corporate recreation facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6YF	YMCA/YWCA	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q6YG	Private gyms	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7	Do the following recreation facilities provide on-site child supervision so adults can be physically active?		
Q7A	Local schools (gyms, outdoor courts/fields)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7B	City/town owned recreation facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7C	Universities/colleges (gyms, outdoor courts/fields)	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7D	State, county or DCR owned facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7E	Corporate recreation facility	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7F	YMCA/YWCA	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7G	Private gyms	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7H	Other facilities	Num	1=Yes, 0=No, 9=missing, 999=non-respondent
Q7OTHER	Other-text	Char	

Q8	Does your city or town promote the use of its and other facilities for physical activities for:		
Q8A	Adults	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q8B	Youths	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q8C	People with disabilities	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q9	If Q8 Yes, does your city or town partner with private organizations such as the YMCA, private gyms or Boys and Girls Club to promote physical activity?	Num	1=Yes, 2=No, 3=DK, 99=Q8≠ Yes, 999=non-respondent
Q10	If Q8 Yes, how does your city or town promote physical activity?		
Q10A	Paid permanent full-time staff	Num	1=Yes, 0=No, 99=Q8≠ Yes, 999=non-respondent
Q10B	Paid seasonal or part-time staff	Num	1=Yes, 0=No, 99=Q8≠ Yes, 999=non-respondent
Q10C	Volunteer staff or committee	Num	1=Yes, 0=No, 99=Q8≠ Yes, 999=non-respondent
Q10D	Paid advertisements in local paper	Num	1=Yes, 0=No, 99=Q8≠ Yes, 999=non-respondent
Q10E	Free advertisements in local paper	Num	1=Yes, 0=No, 99=Q8≠ Yes, 999=non-respondent
Q10F	Flyers in schools, churches	Num	1=Yes, 0=No, 99=Q8≠ Yes, 999=non-respondent
Q10G	At town special events	Num	1=Yes, 0=No, 99=Q8≠ Yes, 999=non-respondent
Q10H	Other methods	Num	1=Yes, 0=No, 99=Q8≠ Yes, 999=non-respondent
Q10OTHER	Other-text	Char	
Q11	Does your city or town have regulations or a permit process that requires new residential or commercial developments to:		
Q11A	Include bikeways	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q11B	Include sidewalks adjacent to roads	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q11C	Include pedestrian walkways	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q11D	Include pedestrian walkways/bikeways connecting cul-de-sacs	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q11E	Prohibit development of cul-de-sacs that are dead end roads	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12	Does your city or town have a policy that requires bikeways or pedestrian walkways:		
Q12A	Alongside bridges	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12B	Alongside freeways	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12C	Alongside major arterials	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12D	Alongside minor arterials	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12E	Alongside major collectors	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent

Q12F	Alongside minor collectors	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12G	Alongside local roads and streets	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12H	To and within parks	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12I	To and around shopping centers	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12J	Alongside waterways	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12K	To and around schools	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12L	To public transportation	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q12M	To be accessible to people with disabilities	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q13	Does your city or town have bicycle parking:		
Q13A	At public transportation hubs	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q13B	At grocery stores	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q13C	At schools	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q13D	At libraries	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q13E	At town centers	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q13F	At shopping centers	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q14	Does your city or town have a policy that:		
Q14A	Requires lighting to enhance safety on sidewalks	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q14B	Requires lighting to enhance safety on pedestrian and bike paths	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q14C	Requires security patrols on pedestrian and bike paths	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q14D	Prohibits bicycles from sidewalks	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q14E	Prohibits unleashed or unrestrained dogs	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q14F	Prohibits cars from idling	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q15	If Q14 Yes, does your city or town enforce these policies?	Num	1=Yes, 2=No, 3=DK, 99=Q14≠ Yes, 999=non-respondent
Q16	Does your city or town have a bicycle or pedestrian safety committee?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q17	Does your city or town provide awareness training or education around:		
Q17A	Bicycle safety	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q17B	Pedestrian safety	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q17C	Sports safety	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q17D	Physical activity	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent

Q18	Does your city or town have a by-law, ordinance, or regulation requiring clearing of ice and snow from sidewalks:		
Q18A	By property owners	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q18B	By municipalities	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q19	If Q18 Yes, is this measure enforced?	Num	1=Yes, 2=No, 3=DK, 99=Q18≠ Yes, 999=non-respondent
Q20	Does your city or town have any "Walk to School" or other programs to encourage children to walk or bike to school?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q21	Does your city or town have the following traffic calming measures:		
Q21A	Speed bumps	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q21B	Reduced speed zones	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q21C	Raised crossings	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q21D	Neckdowns	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q21E	Signal modifications	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q21F	Road realignment projects	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q22	Are the public facilities in your city or town:		
Q22A	Open on weekdays and weekends	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q22B	Open during non-business hours	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q22C	Open year-round	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q22D	Accessible to public transportation	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q22E	Maintained on a regular basis	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q22F	Available at no fee	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q22G	Provided with supervision for children while adults engage in physical activity	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q22H	Appropriate for all age groups	Num	1=Yes, 2=No, 3=DK, 9=missing, 999=non-respondent
Q23	Does your city or town have a policy that requires public facilities to be accessible to people with disabilities?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q24	If Q23 Yes, is this policy enforced?	Num	1=Yes, 2=No, 3=DK, 99=Q23≠ Yes, 999=non-respondent
Q25	Are public indoor facilities and outdoor facilities in your city or town?		
Q25A1	Open on weekdays and weekends	Num	1=Yes, 2=No, 4=no public indoor courts/rinks, 999=non-respondent
Q25B1	Open during non-business hours (ea	Num	1=Yes, 2=No, 4=no public indoor courts/rinks, 999=non-respondent

Q25C1	Open year-round	Num	1=Yes, 2=No, 4=no public indoor courts/rinks, 999=non-respondent
Q25D1	Accessible to public transportatio	Num	1=Yes, 2=No, 4=no public indoor courts/rinks, 999=non-respondent
Q25E1	Maintained on a regular basis	Num	1=Yes, 2=No, 4=no public indoor courts/rinks, 999=non-respondent
Q25F1	Available at no fee	Num	1=Yes, 2=No, 4=no public indoor courts/rinks, 999=non-respondent
Q25G1	Provided with supervision for chil	Num	1=Yes, 2=No, 4=no public indoor courts/rinks, 999=non-respondent
Q25H1	Appropriate for all age groups	Num	1=Yes, 2=No, 4=no public indoor courts/rinks, 999=non-respondent
Q25A2	Open on weekdays and weekends	Num	1=Yes, 2=No, 4=no public outdoor courts/rinks, 999=non-respondent
Q25B2	Open during non-business hours (ea	Num	1=Yes, 2=No, 4=no public outdoor courts/rinks, 999=non-respondent
Q25C2	Open year-round	Num	1=Yes, 2=No, 4=no public outdoor courts/rinks, 999=non-respondent
Q25D2	Accessible to public transportatio	Num	1=Yes, 2=No, 4=no public outdoor courts/rinks, 999=non-respondent
Q25E2	Maintained on a regular basis	Num	1=Yes, 2=No, 4=no public outdoor courts/rinks, 999=non-respondent
Q25F2	Available at no fee	Num	1=Yes, 2=No, 4=no public outdoor courts/rinks, 999=non-respondent
Q25G2	Provided with supervision for chil	Num	1=Yes, 2=No, 4=no public outdoor courts/rinks, 999=non-respondent
Q25H2	Appropriate for all age groups	Num	1=Yes, 2=No, 4=no public outdoor courts/rinks, 999=non-respondent
Q26	At these facilities, does your city or town offer the opportunity for people to participate in organized and non-organized activities?	Num	1=Yes, 2=No, 3=DK, 4=NA, 9=missing, 999=non-respondent
Q27	Do any municipal buildings other than schools with cafeteria?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q28	If Q27 Yes, is there a policy requiring availability of healthy food choices	Num	1=Yes, 2=No, 3=DK, 99=Q27≠ Yes, 999=non-respondent
Q29	Do any municipal buildings have vending machines?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
	Q30: If Q29 Yes, what types of food are available through the mechines?		
Q30A	Candy, chips, or cookies	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30B	Pretzels	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30C	Salads	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30D	Fruit	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30E	Trail mix	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent

Q30F	1% or skim milk	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30G	Soda	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30H	Fresh vegetables	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30I	100% fruit juice	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30J	Granola bars	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30K	Yogurt	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q30L	Water	Num	1=Yes, 2=No, 99=Q29≠ Yes, 999=non-respondent
Q31	If Q29 Yes, any policy requiring healthy foods in vending machines?	Num	1=Yes, 2=No, 3=DK, 99=Q29≠ Yes, 999=non-respondent
Q32	If Q31 YES, any pricing strategy encouraging choosing healthy food?	Num	1=Yes, 2=No, 3=DK, 99=Q31≠ Yes, 999=non-respondent
Q33	Does your school system offer healthy choices for meals they offer to students?		
Q33A	A la cart	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q33B	Prepared meals	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q34	Does your city or town have a bylaw or regulation requiring notices or labels on menus in eating establishments indicating which foods or food items may be healthy?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q35	If Q34 Yes, Does city/town enforce these policies?	Num	1=Yes, 2=No, 3=DK, 99=Q34≠ Yes, 999=non-respondent
Q36	Does your city or town have meal calories listed on menu in eating establishments?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q37	Does your city or town ban use of cooking with trans fats in eating establishments?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q38	Does your city/town provide awareness training or education on:		
Q38A	Choosing healthy foods outside the home	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q38B	Preparing healthy foods	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q38C	Growing fruits and vegetables	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q39	Partner with organizations/retailers to promote healthy eating	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q40	During the past 12 months, has city/town offered health screening services?		
Q40A	Blood pressure screening	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q40B	Cholesterol screening	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q40C	Blood glucose/sugar (diabetes) scr	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q41	If Q40 Yes, which services disability accessible?		
Q41A	Blood pressure screening	Num	1=Yes, 2=No, 99=Q40≠ Yes, 999=non-respondent
Q41B	Cholesterol screening	Num	1=Yes, 2=No, 99=Q40≠ Yes, 999=non-respondent
Q41C	Blood glucose/sugar (diabetes) screening	Num	1=Yes, 2=No, 99=Q40≠ Yes, 999=non-respondent

Q42	Does city/town have a master plan?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q43	If Q42 Yes, are there plans to revise master plan?	Num	1=Yes, 2=No, 3=DK, 99=Q42≠ Yes, 999=non-respondent
Q44	If Q43 Yes, timeline for revision of master plan?	Num	1=Less than 6 mths, 2=6mth-1yr, 3=1yr+, 4=DK, 99=Q43≠ Yes, 999=non-respondent
Q45	If Q42 Yes, does the master plan address the following?		
Q45A	Sidewalks	Num	1=Yes, 2=No, 3=DK, 99=Q42≠ Yes, 999=non-respondent
Q45B	Dead end streets	Num	1=Yes, 2=No, 3=DK, 99=Q42≠ Yes, 999=non-respondent
Q45C	Walkability	Num	1=Yes, 2=No, 3=DK, 99=Q42≠ Yes, 999=non-respondent
Q45D	Density	Num	1=Yes, 2=No, 3=DK, 99=Q42≠ Yes, 999=non-respondent
Q45E	Accessibility	Num	1=Yes, 2=No, 3=DK, 99=Q42≠ Yes, 999=non-respondent
Q46	If Q42 not Yes, plans to create master plan?	Num	1=Yes, 2=No, 3=DK, 99=Q42=Yes, 999=non-respondent
Q47	If Q46 Yes, timeline for creating master plan?	Num	1=Less than 6 mths, 2=6mth-1yr, 3=1yr+, 4=DK, 99=Q46≠ Yes, 999=non-respondent
Q48	Does city/twon have zoning bylaw or ordinance?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q49	If Q48 Yes, does it permit mixed use development?	Num	1=Yes, 2=No, 3=DK, 99=Q48≠ Yes, 999=non-respondent
Q50	In subdivision reviews, does your planning board consider public health issues such as:		
Q50A	Walkability	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q50B	Bikeability	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q50C	Traffic calming	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q50D	Lighting	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q50E	Connectivity to neighborhoods	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q50F	Pedestrian access in general (stair railings,ramps, etc)	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q50G	Pedestrian access to schools (if relevant)	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q50H	Accessibility of town facilities/infrastructure	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q50I	Public parks/playgrounds	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q51	Does city/town plan to build new schools in next 3 yrs?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
Q52	If Q51 Yes, have sites been chosen?	Num	1=Yes, 2=No, 3=DK, 99=Q51≠ Yes, 999=non-respondent
Q53	Does city/twon current emergency management plan have a protocol to identify and assist people with disabilities during an emergency?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent

Q54	If Q53 Yes, were people with disabilities included in the protocol developing process?	Num	1=Yes, 2=No, 3=DK, 99=Q53≠ Yes, 999=non-respondent
Q55	Does city/town use 911 Disability Indicator Form to gather disability info?	Num	1=Yes, 2=No, 3=DK, 999=non-respondent
	Q56: Does city/town have automatic external defibrillators (AEDs) in the following facilities?		
Q56A	Schools	Num	1=Yes, 2=No, 3=DK, 99=no AEDs in city/town, 999=non-respondent
Q56B	Other recreational facilities	Num	1=Yes, 2=No, 3=DK, 99=no AEDs in city/town, 999=non-respondent
Q56C	Other municipal buildings	Num	1=Yes, 2=No, 3=DK, 99=no AEDs in city/town, 999=non-respondent
	Q57: If Q56 Yes, is AEDs replacement in the facilities mandated?		
Q57A	Schools	Num	1=Yes, 2=No, 3=DK, 99=Q56a≠ Yes, 999=non-respondent
Q57B	Other recreational facilities	Num	1=Yes, 2=No, 3=DK, 99=Q56b≠ Yes, 999=non-respondent
Q57C	Other municipal buildings	Num	1=Yes, 2=No, 3=DK, 99=Q56c≠ Yes, 999=non-respondent
2007 Hospitalization Data Items			
HD_total	Total number of hospitalizations	Num	9997=# total hospitalizations 1-6
HD_cvd1_total	Total number of hospitalizations for major cardiovascular disease (ICD 390-434, 436-448)	Num	9997=# CVD1 hospitalizations 1-6
HD_cvd2_total	Total number of hospitalizations for heart disease (ICD 390-398, 402, 404, 410-429)	Num	9997=# CVD2 hospitalizations 1-6
HD_cvd3_total	Total number of hospitalizations for cerebrovascular disease (ICD 430-434, 436-438)	Num	9997=# CVD3 hospitalizations 1-6
HD_cvd4_total	Total number of hospitalizations for transient ischemic attack (ICD 435)	Num	9997=# CVD4 hospitalizations 1-6
HD_cvd5_total	Total number of hospitalizations for hypertension and hypertensive diseases (ICD 401-405)	Num	9997=# CVD5 hospitalizations 1-6
2007 Mortality Data Items			
death_total	Total number of deaths	Num	9997=# total deaths 1-6
death_cvd1_total	Total number of deaths for major cardiovascular disease (ICD 390-434, 436-448)	Num	9997=# CVD1 deaths 1-6
death_cvd2_total	Total number of deaths for heart disease (ICD 390-398, 402, 404, 410-429)	Num	9997=# CVD2 deaths 1-6
death_cvd3_total	Total number of deaths for cerebrovascular disease (ICD 430-434, 436-438)	Num	9997=# CVD3 deaths 1-6
death_cvd4_total	Total number of deaths for transient ischemic attack (ICD 435)	Num	9997=# CVD4 deaths 1-6
death_cvd5_total	Total number of deaths for hypertension and hypertensive diseases (ICD 401-405)	Num	9997=# CVD5 deaths 1-6
2007 CVD hospitalization rate			
HD_total_crude	Unadjusted total hospitalization rate per 100000 population	Num	9997=# total hospitalizations 1-6
HD_total_adj	Age-adjusted total hospitalization rate per 100000 population	Num	9997=# total hospitalizations 1-6

HD_cvd1_crude	Unadjusted hospitalization rate per 100000 population for major cardiovascular disease (ICD 390-434, 436-448)	Num	9997=# CVD1 hospitalizations 1-6
HD_cvd1_adj	Age-adjusted hospitalization rate per 100000 population for major cardiovascular disease (ICD 390-434, 436-448)	Num	9997=# CVD1 hospitalizations 1-6
HD_cvd2_crude	Unadjusted hospitalization rate per 100000 population for heart disease (ICD 390-398, 402, 404, 410-429)	Num	9997=# CVD2 hospitalizations 1-6
HD_cvd2_adj	Age-adjusted hospitalization rate per 100000 population for heart disease (ICD 390-398, 402, 404, 410-429)	Num	9997=# CVD2 hospitalizations 1-6
HD_cvd3_crude	Unadjusted hospitalization rate per 100000 population for cerebrovascular disease (ICD 430-434, 436-438)	Num	9997=# CVD3 hospitalizations 1-6
HD_cvd3_adj	Age-adjusted hospitalization rate per 100000 population for cerebrovascular disease (ICD 430-434, 436-438)	Num	9997=# CVD3 hospitalizations 1-6
HD_cvd4_crude	Unadjusted hospitalization rate per 100000 population for transient ischemic attack (ICD 435)	Num	9997=# CVD4 hospitalizations 1-6
HD_cvd4_adj	Age-adjusted hospitalization rate per 100000 population for transient ischemic attack (ICD 435)	Num	9997=# CVD4 hospitalizations 1-6
HD_cvd5_crude	Unadjusted hospitalization rate per 100000 population for hypertension and hypertensive diseases (ICD 401-405)	Num	9997=# CVD5 hospitalizations 1-6
HD_cvd5_adj	Age-adjusted hospitalization rate per 100000 population for hypertension and hypertensive diseases (ICD 401-405)	Num	9997=# CVD5 hospitalizations 1-6
2007 CVD mortality rate			
death_total_crude	Unadjusted total mortality rate per 100000 population	Num	9997=# total deaths 1-6
death_total_adj	Age-adjusted total mortality rate per 100000 population	Num	9997=# total deaths 1-6
death_cvd1_crude	Unadjusted mortality rate per 100000 population for major cardiovascular disease (ICD 390-434, 436-448)	Num	9997=# CVD1 deaths 1-6
death_cvd1_adj	Age-adjusted mortality rate per 100000 population for major cardiovascular disease (ICD 390-434, 436-448)	Num	9997=# CVD1 deaths 1-6
death_cvd2_crude	Unadjusted mortality rate per 100000 population for heart disease (ICD 390-398, 402, 404, 410-429)	Num	9997=# CVD2 deaths 1-6

death_cvd2_adj	Age-adjusted mortality rate per 100000 population for heart disease (ICD 390-398, 402, 404, 410-429)	Num	9997=# CVD2 deaths 1-6
death_cvd3_crude	Unadjusted mortality rate per 100000 population for cerebrovascular disease (ICD 430-434, 436-438)	Num	9997=# CVD3 deaths 1-6
death_cvd3_adj	Age-adjusted mortality rate per 100000 population for cerebrovascular disease (ICD 430-434, 436-438)	Num	9997=# CVD3 deaths 1-6
death_cvd4_crude	Unadjusted mortality rate per 100000 population for transient ischemic attack (ICD 435)	Num	9997=# CVD4 deaths 1-6
death_cvd4_adj	Age-adjusted mortality rate per 100000 population for transient ischemic attack (ICD 435)	Num	9997=# CVD4 deaths 1-6
death_cvd5_crude	Unadjusted mortality rate per 100000 population for hypertension and hypertensive diseases (ICD 401-405)	Num	9997=# CVD5 deaths 1-6
death_cvd5_adj	Age-adjusted mortality rate per 100000 population for hypertension and hypertensive diseases (ICD 401-405)	Num	9997=# CVD5 deaths 1-6
2009 BRFSS Data Items			
Obese	Percent of adult population aged 18+ with BMI>30	Num	9996= small N inadequate for estimates
Smoker	Percent of adult population aged 18+ who are current smokers	Num	9996= small N inadequate for estimates
NoExcise	Percent of adult population aged 18+ with no excise in the past month	Num	9996= small N inadequate for estimates
EverHTN	Percent of adult population aged 18+ ever being told having hypertension	Num	9996= small N inadequate for estimates
EverDM	Percent of adult population aged 18+ ever being told having diabetes	Num	9996= small N inadequate for estimates
FiveADay	Percent of adult population aged 18+ who eat 5 serves of fruit and vegetables each day	Num	9996= small N inadequate for estimates