CHAPTER 7

Health Care Quality

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HEALTH CARE QUALITY

[I]n scarcely an instance have I been able to obtain hospital records fit for any purpose of comparison. If they could be obtained … they would show subscribers how their money was being spent, what amount of good was really being done with it, and whether the money was not doing mischief rather than good.[95]

— FLORENCE NIGHTINGALE, 1858

The *Data Scan* examines several aspects of health care quality:

- Physician quality
- Malpractice
- Adverse events
- Medical errors
- Ambulatory care sensitive conditions (ACSC)
- Emergency department (ED) visits
- Nursing home quality
- Home health quality
- Health care quality disparities

BACKGROUND

A 2003 Institute of Medicine (IOM) study, *Priority Areas for National Action: Transforming Health Care Quality*, commissioned by the federal Agency for Healthcare Research and Quality (AHRQ),[96] identified 20 diseases and clinical conditions "that may be significantly improved or effectively managed by using best-practice treatment guidelines."[97] These conditions suffer from what the IOM called a "quality gap." The IOM indicated that health care systems were frustratingly slow in adopting best practices to close the quality gaps.

HEALTH CARE QUALITY DEFINITIONS

The federal Quality Interagency Coordination Task Force (QuIC) recommended federal action to reduce medical errors and their impact. QuIC's 2000 review included several definitions that can help to inform the discussion about health care quality:

- **Adverse event:** an injury [harm] caused by medical management and that results in measurable disability.
- **Error:** the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Errors can include problems in practice, products, procedures, and systems.
- **Unpreventable adverse event:** an adverse event resulting from a complication that cannot be prevented given the current state of knowledge.
- **Medical error:** an adverse event or near-miss that is preventable with the current state of medical knowledge.
- **Near-miss:** an event or situation that could have resulted in an accident, injury or illness, but did not, either by chance or through timely intervention.
- **System:** a regularly interacting or interdependent group of items forming a unified whole.
- **Systems error:** an error that is not the result of an individual's actions, but the predictable outcome of a series of actions and factors that comprise a diagnostic or treatment process.[98]

Connecticut Department of Public Health (DPH) distinguishes between adverse events caused by medical errors and medical errors that do not result in adverse events. For example, if a patient who has no known allergies develops an allergic reaction to a drug, that reaction would be an adverse event but not a medical error. On the other hand, if a patient with a documented allergy to a drug has an allergic response to the drug, the adverse response would have been caused by a medical error. If a drug was prescribed to a patient with a documented allergy to it, but the physician changed the prescription after being alerted to the error by the pharmacist, there was a medical error but no adverse event. By focusing on the National Quality Forum (NQF) list of serious reportable events, "those reported are more likely to be preventable."[99]

PHYSICIAN QUALITY

DPH's listing of licensed but inactive physicians notes whether a physician is inactive because of a suspended license. DPH also notes whether a physician's license was formerly suspended but reinstated in its file of active physicians. The file does not provide the cause of license suspension nor the reason for the lapse among those reinstated.

MEDICAL MALPRACTICE

Although there is ongoing debate nationally and in Connecticut regarding medical malpractice awards, the number of malpractice claims filed appears to be a weak measure of actual medical error on a number of grounds.

Using claims filed as a measure may lead to overestimates of actual medical error since not all claims filed are actually awarded. On the other hand, claims filed may be only the "tip of the iceberg" regarding actual medical error, leading to underestimates. An historical series of counts of medical malpractice claims filed was tabulated in an Office of Legislative Research (OLR) report in 2002.[100] The original source of the data in the OLR report is not clear. It appears to be taken from rate increase filings from the medical malpractice insurance companies, including Connecticut Medical Insurance Company (CMIC), accounting for about 55 percent of the market; American Healthcare; Truck Insurance Exchange; Proselect; and MIIX. Besides these problems, the filings cover only regulated companies. They do not include "risk retention groups" or "captives," such as Vermont Captive, which insured a substantial number of practices in the state at the date of the report.

The data in Table 88 suggest that medical malpractice claims have not changed appreciably since 1987-88.

TABLE 88: MEDICAL MALPRACTICE CLAIMS FILED IN CONNECTICUT, 1986-2002

Year	Number of Medical Malpractice Cases Filed
1986-1987	512
1987-1988	377
1988-1989	312
1989-1990	298
1990-1991	262
1991-1992	272
1992-1993	331
1993-1994	337
1994-1995	385
1995-1996	384
1996-1997	382
1997-1998	337
1998-1999	389
1999-2000	369
2000-2001	366
2001-2002	368

Source: Harleston, J. OLR Report: Medical Malpractice. 2003-R-0218. Feb. 19, 2002.
See Harleston reference in reference notes.

Another source of medical malpractice data is the National Practitioner Data Bank of the Bureau of Health Professions, part of the U.S. Department of Health and Human Services (HHS). Statewide and national data from 1990 through 2003 are available for more detailed studies. National and state-level statistical data are available — such as the 2,280 medical malpractice reports in Connecticut between 1990-2003. The statistical summaries do not identify individual practitioners and institutions.[101]

MEDICAL ERROR DATA

A 1999 report by the IOM's Committee on the Quality of Health Care in America, *To Err is Human: Building a Safer Health System,* estimated that between 44,000 and 98,000 Americans die each year from preventable medical errors.[102] This indicates that between 1.8 percent and 4 percent of all deaths in the United States are attributable to medical error. Although there have been claims that the IOM report inflated the level of medical errors,[103] the study authors have rebutted these claims.[104]

The IOM report was preceded by the classic 1977 "California" study of adverse events[105] and a Harvard Medical Practice Study based on 1984 data.[106] The IOM report has led to many federal and state research studies and policies to respond to the systemic problems revealed.[107,108,109] Some work has been done using different methodologies to compare New York, Wisconsin, Colorado, Utah, and Australian rates.[110] International surveys have suggested that U.S. health care quality is particularly problematic, at least as reported by patients.[111] The IOM study also spawned numerous state-level studies and documents distributed by citizen organizations, including Ralph Nader's Public Citizen Health Care Research Group.[112]

MEDICAL ERRORS IN CONNECTICUT

The IOM range of medical error estimates would translate into 542 to 1,208 of the 30,122 total deaths in Connecticut in 2002. Thus, the range of medical error fatalities based on the IOM study could account for a number of deaths in the range of ninth-ranked nephritis (554 deaths) or fifth-ranked "unintentional injuries" (1,182 deaths).[113]

ADVERSE EVENTS

According to the DPH, hospitals and outpatient surgical facilities are required to report adverse events. DPH defines these as "a discrete, auditable, and clearly defined occurrence with a negative consequence of care that results in unintended injury or illness, which may or may not have been preventable."[114]

The adverse events used as indicators by the NQF include surgical events (five types); product or device related events (three types); patient protection events (three types); care management events (seven types); environmental events (five types); and criminal events (four types). Six Connecticut-specific events have been added, including nosocomial (hospital-acquired) infections resulting in death or serious injury.

The NQF list adopted for Connecticut is "a nationally agreed upon list of events that should never occur."[115] It includes things like performing surgery on the wrong body part or wrong patient; discharging a baby to the wrong family; or an assault that causes significant injury or death of a patient or staff member on the grounds of a health care facility.

The current Connecticut adverse event reporting system went into effect in July 2004. In the months between July 1, 2004, and Sept. 14, 2005, 239 adverse event reports were recorded. The most frequent events were falls (98 cases), perforations during surgery (59 cases), and stage 3 or 4 pressure ulcers (21 cases); 25 deaths were recorded.[116] Only three infections resulting in death or serious injury were counted in this same series.

HOSPITAL-ACQUIRED INFECTIONS

The Centers for Disease Control and Prevention (CDC) and other agencies, such as the National Nosocomial Infections Surveillance System, have indicated that hospital-acquired infections are a main source of preventable death in hospital environments. Increased hand-washing by medical professionals is an important practical way to avoid nosocomial infections.[117]

Healthy People 2010 contains baseline statistics and goals for nosocomial infections in hospital intensive care units. These are typically expressed in units of infections per 1,000 patient days. For example, the 1998 baseline for "central line-associated bloodstream infection" is 5.3 infections per 1,000 patient-days, and the *Healthy People 2010* target is 4.8 infections per 1,000 patient-days.[118]

Connecticut's small number (three) of reported hospital-acquired infections is in marked contrast to the 2004 figures for Pennsylvania, estimated at 7.5 per 1,000 hospital admissions by the Pennsylvania Health Care Cost Containment Council. Of these patients, 15.4 percent died — compared to 2.4 percent of patients who died without having a hospital-acquired infection. These rates are considered likely to be underestimates.[119,120] If the Pennsylvania rates were applied to Connecticut, approximately 426 Connecticut residents each year would die of hospital-acquired infections. There is a major discrepancy between this estimate and the number actually reported (three deaths in 14.5 months).

DPH has suggested that the marked difference in reported and expected rates of adverse events may be due to: (1) fear of malpractice litigation; (2) fear of adverse publicity; (3) inability to identify incidents; (4) reporting burden; (5) lack of perceived usefulness; and (6) unclear adverse event definitions.[121]

In 2004, DPH, together with the Connecticut Hospital Association (CHA), surveyed hospital administrators to ascertain some of the reasons for poor reporting by hospitals. While the response rate was low (25 percent), those responding mentioned "the nature of the follow-up DPH investigation as a disincentive to reporting." The report suggested that the ways to improve the adverse event reporting system included:

- Clarifying reporting requirements to reduce variability.
- Reviewing the present reporting timeframe to allow for thorough investigation and comprehensive corrective action plans.
- Providing confidentiality to encourage reporting while still promoting public accountability.[122]

HOSPITAL PERFORMANCE MEASURES

Comparing hospital clinical performance beyond the obvious measures (e.g., operating on the right limb, protecting patients from nosocomial infection) has proven to be a difficult task. This occurs for three fundamental reasons: (1) there may be disagreement among clinicians regarding the utility of particular types of care; (2) the type of care may not be applicable to certain classes of patients, and therefore, hospitals who have more of that type of patient will be "unfairly" graded in the performance comparisons; and (3) the numbers of certain types of patients in some hospitals may be so small that the performance rates are statistically unreliable.

Much effort has gone into defining measures on which there is broad agreement, determining appropriateness for classes of patients, and assuring that the numbers of patients are sufficient to provide reliable estimates.

There is broad agreement that certain measures of care for heart attack, heart failure and pneumonia meet these three criteria. The measures include:

For heart attack:

- Giving aspirin within 24 hours of arrival
- Giving a prescription for aspirin upon discharge
- Giving an angiotensin-converting enzyme (ACE) inhibitor if heart function is impaired
- Giving a prescription for a beta-blocker upon discharge
- Giving a beta-blocker within 24 hours of arrival

For heart failure:

- Performing a left ventricular function (LVF) assessment
- Giving an ACE inhibitor if heart function is impaired

For pneumonia:

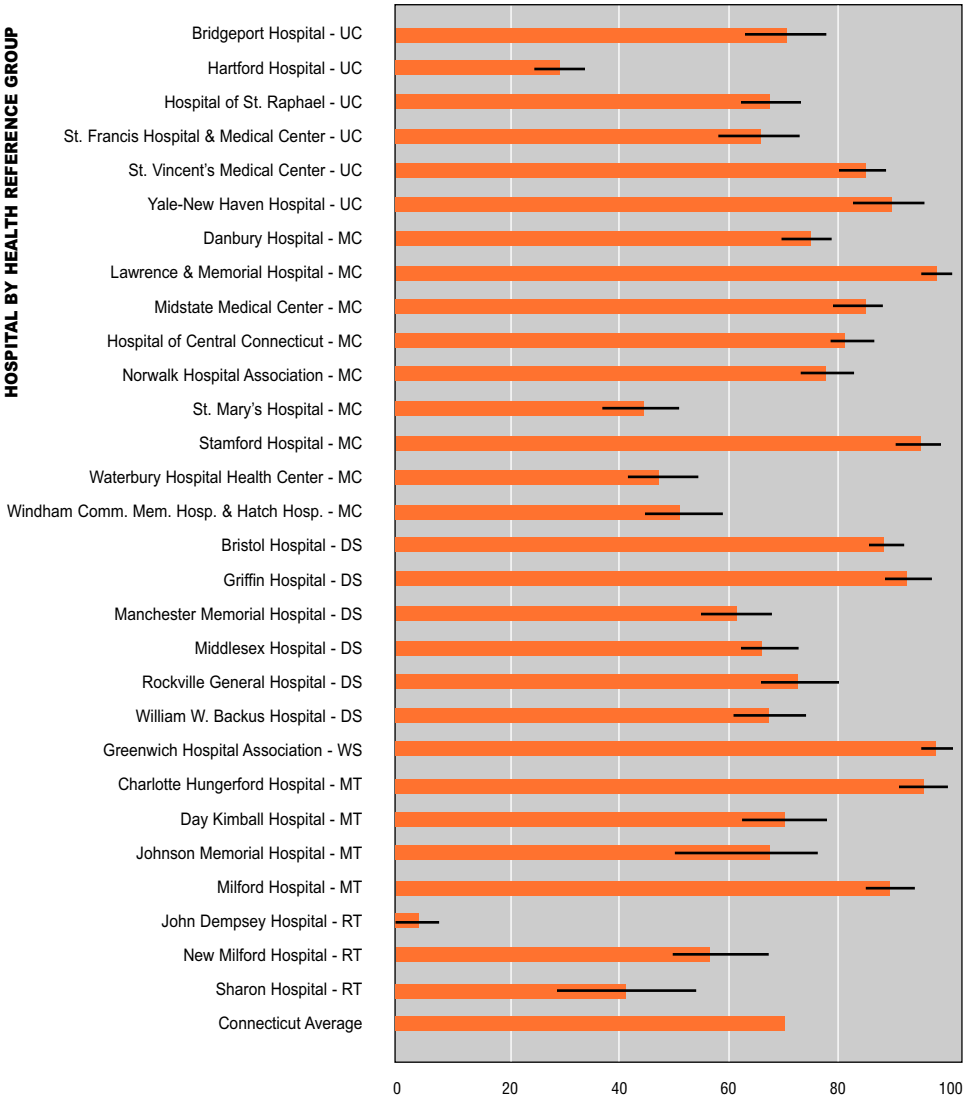
- Oxygenation assessment within 24 hours of arrival
- Screening for and/or giving a pneumonia vaccination before discharge
- Giving an antibiotic within four hours of arrival

DPH has published reports on variation among Connecticut hospitals in the extent to which these widely accepted care standards are accomplished.[123]

Hospital Quality — Data from Hospital Compare

"Hospital Compare," an interactive quality tool operated by the HHS, reports data on 20 indicators similar to the NQF derived measures used by the DPH. These measures identify variation among hospitals, but they do not allow for population-based estimates of disparity based on patient residence or other characteristics. Figure 19 presents a sample of the data available in Hospital Compare, for hospitals reporting a sufficient number of cases. These data suggest that there is significant variation among Connecticut hospitals on some measures. Year-to-year comparisons, however, indicate significant variation in the number of cases for each hospital, suggesting possible data collection problems.

FIGURE 19: PERCENTAGE OF PNEUMONIA PATIENTS ASSESSED AND GIVEN PNEUMONOCOCCAL VACCINE, IF APPROPRIATE, APRIL 2005-MARCH 2006



Source: HHS Hospital Compare. Available at: http://www.hospitalcompare.hhs.gov.
Note: Whiskers on bars indicate 95 percent confidence intervals. If the whiskers do not overlap, then the difference between two rates is statistically significant.

Hospital Quality — Patient Satisfaction

Hospitals for many years have used patient satisfaction surveys, such as the Picker and Press-Ganey surveys. The federal government has worked with associations of hospitals, quality organizations and survey experts to develop a standardized survey. The survey will be voluntary, but it is widely believed that all or almost all hospitals will take part since results will be put on a federal web site — where lack of participation will be prominently noted. The AHRQ's Consumer Assessment of Healthcare Providers and Systems (CAHPS) is developing patient satisfaction surveys for nursing homes, ambulatory, and managed care settings.[124]

MANAGED CARE QUALITY — HEDIS® MEASURES

"HEDIS® (Health Plan Employer Data and Information Set) is a set of performance measures developed by the National Committee for Quality Assurance (NCQA) to let independent reviewers evaluate managed-care programs on five major areas of performance: (1) access and service, (2) qualified providers, (3) staying healthy, (4) getting better, and (5) living with illness.[125]

Six of the nine health maintenance organizations (HMOs) operating in Connecticut and listed on the NCQA web site had been evaluated as of Nov. 8, 2005, all with summary accreditation scores of excellent. The HEDIS® measures in use did not discriminate well among the health plans. The remaining three health plans had not yet been evaluated. Another problem with the review is that it does not specify the geographic location of the patient or other relevant variables, so that health care disparities may not be evaluated. Such data are typically available within the individual plan's databases, and individual organizations could use (and have used) them for systematic quality improvement efforts.

One Midwestern managed care plan provided an example of this kind of quality analysis in its quality improvement research review of comprehensive diabetes care, specifically the percentage of cases in which foot exams were performed. The rates were approximately 82 percent for whites, 55 percent for blacks, 52 percent for Hispanics, and 33 percent for Asians. The differences between whites and all other groups taken together were statistically significant.[126] Such analyses of disparities could be encouraged in Connecticut managed-care plans, and followed up with improvement efforts.

NURSING HOME QUALITY

Several types of quality information are available for long-term care facilities: counts of deficiencies on federally mandated and state-conducted nursing home inspections, done approximately yearly, and health status indicators and changes in health status of the residents, as reported quarterly by each facility.

Those measures are available at www.medicare.gov/NHCompare/home.asp for all Medicare and/or Medicaid-certified facilities in Connecticut, which includes virtually all licensed facilities. The results indicate Health Reference Group (HRG) differences in quality of care as measured by the percentage of those with 20 or fewer deficiencies. Facilities in the Mill Towns and Rural Towns have fewer deficiencies than those in the Urban Centers. This finding is due primarily to the poor performance of Bridgeport facilities: only one of five Bridgeport facilities had 20 or fewer deficiencies.

Another measure of quality is the percentage of residents experiencing severe pain. This indicator shows a lower percentage experiencing severe pain in the Urban Centers than in the Mill Towns and Rural Towns. No explanation is available for the observed differences between the state-conducted inspections and the facility-reported pain quality measures. No data are reported by race or ethnicity.

TABLE 89: NURSING HOME DEFICIENCIES ON INSPECTION AND PERCENTAGE OF NURSING HOME RESIDENTS EXPERIENCING PAIN, 2005

AREA	Number of Licensed Nursing Home Facilities	Number with 20 or Fewer Deficiencies at Latest Inspection Round	Percentage with 20 or Fewer Deficiencies	Average Number of Deficiencies per Facility	Average Percentage of Residents Experiencing Severe Pain
HRG 1 (3)-UC	18	8	44	23.8	3.06
Bridgeport	5	1	20	35.6	
Hartford	5	3	60	19.0	
New Haven	8	4	50	19.4	
HRG 2 (10)-MC	50	27	54	20.9	3.54
HRG 3 (15)-DS	48	28	58	20.7	4.33
HRG 4 (27)-WS	30	15	50	20.3	4.63
HRG 5 (39)-MT	64	41	64	16.6	4.68
HRG 6 (75)-RT	36	23	64	19.2	4.69
Connecticut	246	142	58	20.0	

Source: Nursing Home Compare. Information on Medicare/Medicaid-certified nursing homes, resident and inspection information available at: http://www.medicare.gov/NHCompare.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

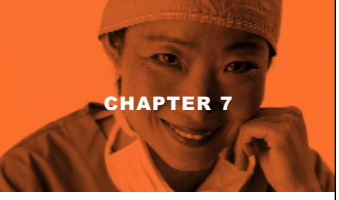
HOME HEALTH CARE QUALITY

Home health quality measures come from information collected by Medicare- and Medicaid-certified home health agencies and are publicly available through the Home Health Compare web site www.medicare.gov/HHCompare/. There are 93 agencies on the Home Health Compare list for Connecticut, of which 10 are owned or managed out of state. They collect information about Medicare and Medicaid patients who receive skilled care.

Information is collected about patients' health; how they function; the skilled care and social, personal, and support services they need; and their living conditions. This information set is called the Home Health Outcome and Assessment Information Set. Skilled home health staff gather the information by observing the patient and the patient's home and situation. They also gather information by talking with the patient and caregivers. The broad quality measurement areas are:

- Improvement in getting around
- Patient's activities of daily living
- Patient medical emergencies
- Improvement in mental health

Detailed measures are presented in Appendix I.



Outlier agencies, thus, could be identified for further investigation and work on quality improvement. As with the nursing home quality data, summaries by provider town, region and HRG could be produced. But they have little meaning in analyzing population-based quality because home health agencies are multi-town in scope. No data are publicly available to assess home health care disparities.

RECOMMENDED IMPROVEMENT STRATEGIES

The IOM followed the *To Err* report with *Crossing the Quality Chasm* and offered several findings, aims and rules for quality improvement. First, "errors occur because of system failures" and "preventing errors means designing safer systems of care." Second, the aims of improvement efforts should be that health care will be more "safe, effective, patient-centered, timely, efficient, and equitable." Finally, the IOM suggested new rules for health care quality improvement, as shown in Table 90.[127]

TABLE 90: 10 SIMPLE RULES FOR HEALTH CARE QUALITY IMPROVEMENT

Current Approach	New Rule
Care based on visits	Continuous healing relationships
Professional autonomy	Customized care for patients
Professionals control care	Patient is source of control
Information is a record	Information flows freely
Decision making is based on training and experience	Decision making is based on evidence
Safety is individual responsibility	Safety is a system property
Secrecy is necessary	Transparency is necessary
The system reacts to needs	Needs are anticipated
Cost reduction is sought	Waste is continuously decreased
Professional roles trump the system	Cooperation is a priority

Source: IOM Committee on the Quality of Health Care in America. Summary of, Crossing the Quality Chasm: A New Health System for the 21st Century. See endnote for full reference.

The IOM followed its early reports on quality by identifying 20 priority areas thought to be prime targets for improvement in health care delivery, as indicated in Table 91.

TABLE 91: 20 KEY TARGET AREAS FOR TRANSFORMING THE HEALTH CARE SYSTEM

Key Target Areas		
Asthma	Frailty associated with old age	Pain control in advanced cancer
Care coordination (cross-cutting)	Hypertension	Pregnancy and childbirth
Children with special health care needs	Immunization	Self-management/health literacy
Diabetes	Ischemic heart disease	Severe and persistent mental illness
End of life with advanced organ system failure	Major depression	Stroke
Evidence-based cancer screening	Medication management	Tobacco-dependence treatment in adults
	Nosocomial infections	
	Obesity	

Source: The National Academies News Office: Publication Announcement "Officials Should Target 20 Key Areas to Transform Health Care System." Jan. 7, 2003.

One of the target conditions the IOM evaluated was diabetes care. The report stated that many patients cannot control their blood sugar, and others are not receiving an adequate level of overall care — including annual glycosylated hemoglobin checks, retinal eye screening and foot screening, annual influenza immunizations, and blood lipid testing every two years.[127]

The IOM suggested quality improvement strategies for diabetes and others of the 20 conditions it examined, including:

- Using reminder systems for physicians and patients.
- Transmitting patient data from outpatient specialty clinics to the patient's primary physician via telephone, fax or e-mail.
- Continuing education for physicians and patients.[128]

PRIMARY CARE QUALITY: AMBULATORY CARE SENSITIVE CONDITIONS

The Connecticut Office of Health Care Access (OHCA) has identified several conditions as ambulatory care sensitive conditions (ACSC), conditions in which hospitalization can be avoided through good primary care. A high rate of ACSC is an indicator that the illness is not being handled well in the primary care setting for any of several reasons: the patient had inadequate access to primary care; the patient did not make use of primary care, even when it was available, until late in the disease process, and then required hospitalization; the patient used primary care, but did not follow the prescribed medical regimen; and the underlying condition may be frequent in the underlying population (e.g., rates of diabetes among blacks) and might still be higher even with equal access to and utilization of primary care. Thus, ACSC rates are "flags" for further investigation, not conclusions about cause.

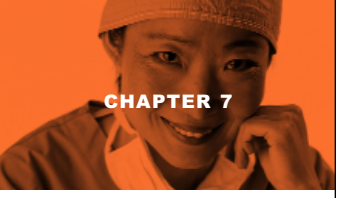


TABLE 92: ANNUALIZED AGE- AND GENDER-ADJUSTED RATES OF HOSPITALIZATION PER 100,000 FOR AMBULATORY CARE SENSITIVE CONDITIONS, 2000-2004

AREA	Total Population	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic*
HRG 1 (3)-UC	2,070	1,507	2,648	2,568	
HRG 2 (10)-MC	1,692	1,450	2,491	2,294	
HRG 3 (15)-DS	1,315	1,248	2,047	1,419	
HRG 4 (27)-WS	871	865	1,473	626	
HRG 5 (39)-MT	1,292	1,287	1,976	1,146	
HRG 6 (75)-RT	1,046	1,037	1,449	691	
Connecticut	1,348	1,191	2,397	2,087	

Source: OHCA; U.S. Census SF1 PCT 12.

**Not reported due to standard methodology used by Connecticut Office of Health Access. Age adjustment by gender and age groups 0-44, 45-64, 65-74 and 75+. Denominators used are white-alone non-Hispanic, black-alone non-Hispanic, and Hispanic, any race.*

Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

Table 92 indicates that ACSC rates are highest in the Urban Centers, followed by the Manufacturing Centers, Diverse Suburbs, Mill Towns, Rural Towns, and Wealthy Suburbs. ACSC rates are highest for blacks — double the rates of whites — followed by Hispanics.

But the statewide results hide a more subtle pattern within the HRGs. In the Wealthy Suburbs and Rural Towns, the rate for Hispanics is actually less than for whites and is virtually the same in the Diverse Suburbs and Mill Towns. Hispanic ACSC rates are much higher than for whites only in the Urban and Manufacturing centers. In these cities, the Hispanic and black ACSC rates are similar.

Although there are no data on subpopulations for this table, the dominant Hispanic group within the Urban Centers is Puerto Rican. So a reasonable hypothesis is that the high ACSC rates among Hispanics within these communities are due largely to the Puerto Rican Hispanic population. The HRG with the lowest Puerto Rican Hispanic population is the Wealthy Suburbs, which also has the lowest ACSC rate for Hispanics.

The remaining differences could be due to composition effects or subtle differences among the Hispanic populations not picked up in the ACSC data. Or they also may be due to "context" effects — for example, residence in the Rural Towns may have a protective effect for persons of Puerto Rican background, since a fairly high proportion of Hispanic residents in the Rural Towns (45.5 percent) are Puerto Rican, yet their age-adjusted ACSC rate (691 per 100,000) is one of the lowest in the entire table of ACSC results. Further work is needed to test the hypothesis of disparities within the Hispanic population.

HEALTH CARE ACCESS AND QUALITY: EMERGENCY DEPARTMENT VISITS

Variation in the rates of ED use can indicate problems with access to care or continuity of care. The primary role of the ED is to stabilize persons with injuries and acute conditions. But the ED is often used for unscheduled care because of inadequate capacity to provide timely care in other parts of the health care system. Evaluating ED use rates in Connecticut provides an indicator to track disparities in access to and use of the health care system.

ED visits increased nationally from 90.3 million in 1993 to 113.9 million in 2003. Statistics for 2003 ED use indicate that only 15 percent of ED visits in the United States were emergent (requiring treatment within 15 minutes of arrival). Thirty-five percent were urgent (15-60 minutes), 20 percent semi-urgent (1-2 hours), 13 percent nonurgent (2-24 hours), and 17 percent unknown or not triaged.

Blacks had a higher proportion of nonurgent ED visits (16.5 percent) compared with whites (11.9 percent). This may indicate that black residents are relatively underserved in or underutilize the primary care system. Higher proportions of nonurgent ED use were also reported for younger age groups (under 15 and 15-24) and for persons covered by Medicaid or Self-Pay. A significant proportion of the U.S. population reports that the hospital emergency department, and not a physician, is their usual source of care.[129]

A study was conducted for the *Data Scan*, based on hospital ED record data from the CHA's CHIME Database for fiscal years 2002 and 2003 combined. More recent data were not used since coverage of Connecticut hospitals was not complete for fiscal year 2004. For 2002-2003, there were 2,638,562 ED visits for Connecticut residents. Connecticut residents treated outside of the state and non-Connecticut residents treated in Connecticut were not included.

Of the 2,638,562 visits over the two-year interval, 15.1 percent resulted in an inpatient admission. Individual city and town data were not available, due to privacy restrictions, but HRG-level data were released for analysis. The complete report is online at www.cthealth.org. The results are summarized below:

- The crude annual ED visit rate per 1,000 Connecticut residents was 387.4, and the age and gender-adjusted rate was 388.0.
- The highest ED rates were in the Urban Centers (Bridgeport, Hartford, New Haven), while the lowest rates were in the Wealthy Suburbs. The age- and gender-adjusted rate in the Urban Centers (608.1) was 2.7 times the rate in the Wealthy Suburbs (222.0).
- The results indicate that HRG-to-HRG variation in the use of the ED for treatment of such medical conditions as asthma, otitis media, acute upper respiratory infections, abdominal pain, and back and neck strains was greater than HRG-to-HRG variation in ED use for treatment of injuries.
- Comparing ED rates between the Urban Centers and the Wealthy Suburbs, diagnoses with the largest variance were asthma (18.6 vs. 2.6, a ratio of 7.2 to 1), otitis media (12.2 vs. 2.3, a ratio of 5.3 to 1), and acute upper respiratory infections (26.3 vs. 5.5, a ratio of 4.8 to 1).

The results suggest that the populations living in Urban Centers are most likely to use the hospital ED for treatment of conditions that could easily be treated in a physician's office or clinic.

Table 93 shows the overall crude and age-adjusted rates of ED visits, those that led to hospital admission, and demonstrates the large HRG differences: the Urban Centers > Manufacturing Centers > Diverse Suburbs > Mill Towns > Rural Towns > Wealthy Suburbs. These differences may have significant policy implications.

TABLE 93: EMERGENCY DEPARTMENT VISITS BY HRG, FISCAL YEARS 2002 AND 2003

AREA	2000 Population	Total ED Visits 2002-2003	ED Visits, Patient Admitted 2002-2003	ED Visits, Patient Not Admitted 2002-2003	Annual Crude ED Visit Rate	Annual Age-Adjusted ED Visit Rate	Age and Sex Adjusted ED Visit Rate, Patient Admitted	Age and Sex Adjusted ED Visit Rate, Patient Not Admitted
TOTAL	3,405, 565	2,638,562	398,980	2,239,582	387.4	388.0	54.5	333.4
HRG 1 (3)-UC	384,733	467,560	59,600	407,960	607.6	608.1	85.8	522.3
HRG 2 (10)-MC	662,398	660,143	90,460	569,683	498.3	492.7	64.6	428.2
HRG 3 (15)-DS	587,504	475,430	73,022	402,408	404.6	398.3	54.0	344.3
HRG 4 (27)-WS	487,620	209,322	41,253	168,069	214.6	222.0	39.1	182.8
HRG 5 (39)-MT	698,517	480,080	82,816	397,264	343.6	341.2	51.9	289.3
HRG 6 (75)-RT	584,793	346,027	51,829	294,198	295.9	306.6	43.2	263.4

Source: CHIME Database, CHA.

Given the large HRG differences in ED visit rates, it would be useful to determine whether these rates also vary by race and ethnicity and which specific conditions show the largest disparities. ED visit rates by race and ethnicity have been estimated according to a procedure available in the full ED report at www.cthealth.org.

TABLE 94: EMERGENCY DEPARTMENT VISITS BY HRG AND RACE/ETHNICITY, FISCAL YEARS 2002 AND 2003

AREA	Annual Age- and Sex-Adjusted ED Visit Rate	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
HRG 1 (3)-UC	608.1	423.9	745.4	743.3	117.8
HRG 2 (10)-MC	492.7	394.3	720.8	724.1	76.8
HRG 3 (15)-DS	398.3	379.1	564.3	498.7	126.7
HRG 4 (27)-WS	222.0	217.3	392.4	264.0	95.1
HRG 5 (39)-MT	341.2	340.9	554.6	319.1	99.3
HRG 6 (75)-RT	306.6	308.0	412.0	203.4	114.8
Connecticut	388.0	329.4	674.1	640.5	100.0

Source: CHIME Database, CHA.
Note: Race and ethnicity specific rates are age and sex adjusted.

Table 94 demonstrates several important lessons. First, there are clear HRG differences when controlling for race and ethnicity. The order of the HRGs is similar for all groups except for Asians: Urban Centers > Manufacturing Centers > Diverse Suburbs > Mill Towns > Rural Towns > Wealthy Suburbs.

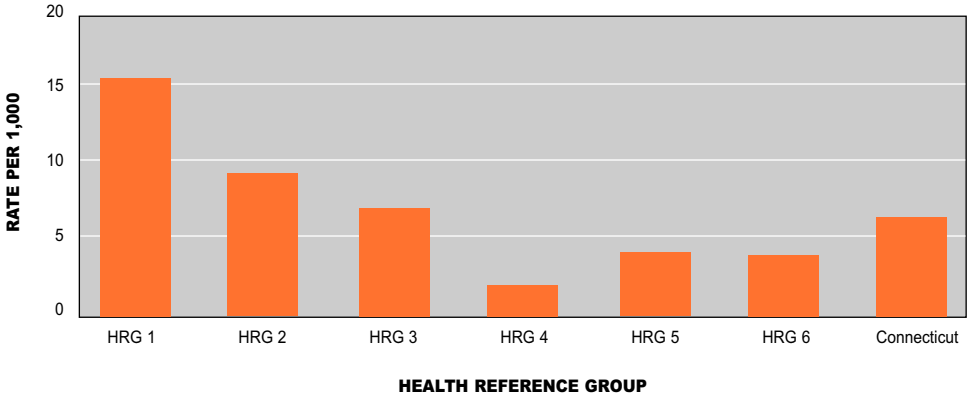
Second, there are clear race and ethnicity differences when controlling for HRG. Within each HRG, black residents show the highest rate of ED visits, followed by Hispanics (in the Urban Centers, Manufacturing Centers, Diverse Suburbs, and Wealthy Suburbs) and then by whites (in the Mill Towns and Rural Towns). Asians have uniformly the lowest ED visit rates.

Third, the pattern of HRG/race and ethnicity differences varies considerably. For example, HRG makes virtually no difference for Asians but a great deal of difference for Hispanics [the ratio of the highest rate in the Urban Centers to the lowest in the Rural Towns is 743.3: 203.4 (= 3.7:1). For blacks, the largest rate is 745.4 in the Urban Centers compared with 392.4 in the Wealthy Suburbs (= 1.9:1); for whites, 423.9 in the Urban Centers compared with 217.3 in the Wealthy Suburbs (= 2.0:1); and for Asians 126.7 in the Diverse Suburbs compared with 76.8 in the Manufacturing Centers (= 1.6:1)].

These results are consistent with both composition effects — the people in the HRGs may be different and context effects — some HRGs may exert protective effects on their residents while other HRGs may exert health-demoting effects. Based on the current data, disentangling these two types of effects is not possible. Further, differences may exist in access to and utilization of alternatives to emergency care. What does seem clear is that based on this and other indicators, some groups of Asian residents may be relatively and uniquely impervious to the health-demoting aspects of American urban culture.

Some types of ED visits show extreme variation as illustrated in Figure 20 for asthma-related ED visits. This variation points to great opportunities to target the Urban Centers to improve access to and utilization of primary care, the quality of patient-provider communications and, therefore, the results of the primary care system, as a means of avoiding unnecessary emergency care.

FIGURE 20: ASTHMA AGE- AND GENDER-ADJUSTED ANNUAL RATES OF EMERGENCY DEPARTMENT USE PER 1,000 RESIDENTS BY HEALTH REFERENCE GROUP, STATE FISCAL YEAR 2002-2003



Source: CHIME Database, CHA; U.S. Census 2000, SF1: Table P12.

HEALTH CARE QUALITY DISPARITIES

There is a growing research literature on health care quality disparities focused on the differential treatment of, or outcomes for, patients based on race and ethnicity. Although there are no state-specific disparities data for Connecticut, the research is still worth examining to develop hypotheses and suggest directions for investigation.

The recent IOM report — *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* — summarized the current situation: "[R]acial and ethnic minorities tend to receive a lower quality of care than non-minorities, even when access-related factors, such as patient's insurance status and income are controlled."[130] The report states that a large body of research underscores the existence of disparities — such as the lower likelihood that minorities will be given appropriate cardiac medications, undergo bypass surgery, or receive kidney dialysis or transplants, and the greater likelihood they will receive other less-desirable procedures, such as lower limb amputations for diabetes and other conditions."[131]

Many additional aspects of such disparities have been investigated since the publication of the IOM report. A Kaiser Family Foundation study found that among 81 studies of racial/ethnic differences in cardiac care, 68 showed differences in favor of white patients, 11 studies found no differences, and two studies found differences in favor of minority patients.[132] Other organizations have developed initiatives to address health care quality disparities, such as the Commonwealth Fund's Program on Quality of Care for Underserved Populations,[133] and the AHRQ's National Healthcare Disparities Report, which provides a summary health care disparity measure based on race, ethnicity, and income.[134]

A 2005 report in the *New England Journal of Medicine* on trends in quality of care for racial minorities showed small but statistically significant reductions over time in disparities in HEDIS® measures. These include breast cancer screening, diabetes care and two indicators of cardiovascular care. On one measure of cardiovascular care, control of LDL cholesterol level, the report found low levels (68 percent for white patients, 51 percent for black patients), and no statistically significant improvement between 1999 and 2002. [135]

Other studies of surgical procedures in a Medicare population found no evidence of disparity reduction nationwide. They found significant reductions in certain geographic regions, but no *elimination* of disparity in any region.[136]

Analyses based on the National Registry of Myocardial Infarction (NRMI) similarly showed no significant reduction in crude rates of disparities, but noted that some disparities become not significant after multivariate rate adjustment.[137]

Recent research has pointed to the role of comorbidities in accounting for some of the breast cancer survival time difference between black and white women. Black women have significantly shorter survival time than white women, but they are also more likely to have co-morbidities. As these are factored out, most of the disparity in all-cause survival time disappears, though not the disparity in cancer-specific survival.[138]

A 2005 presentation[139] at the Harvard University School of Public Health's annual Symposium on Racial and Ethnic Health Disparities in the United States suggested that the higher prevalence of co-morbidities (e.g., hypertension and diabetes) among minorities should be considered in analyzing disparities in health outcome:

- As mediators of treatment choices or of treatment effectiveness.
- As predictors of survival or other health outcomes, independent of treatment for primary conditions being studied.

The presenter provided an instructive list of possible explanations for disparities, illustrated in Table 95.

TABLE 95: POSSIBLE EXPLANATIONS FOR DISPARITIES[140]

Environmental Factors	Individual Factors
Income/Poverty	Cultural beliefs and preferences
Insurance coverage	[Lack of] trust in providers and organizations
Geographic access	Literacy
Poor-quality facilities and providers in minority neighborhoods	Biased clinical decision making
Cultural competence of providers and systems	Some possible biological differences
Language barriers	
Institutional racism	

Source: See Nerenz endnote for full reference.

Quality improvement work, dedicated to understanding and reducing disparities in the primary care setting, might focus on the operational quality of the networks serving primarily "minority" patients and on problems of follow-up that may have significant effects on "minority" patient outcomes.[141]

Health care quality improvement work can productively focus on disparities. This work ultimately needs to happen within and among health care institutions, supported by larger quality-promoting entities, working with adequate quality metrics that include disparity measures and which adequately account for the roles of patient treatment choices and of co-morbidities.

SUMMARY OF HEALTH CARE QUALITY

Health care quality embraces many different aspects of the system, but we suggest a focus on the quality of care and networking in the primary care system. Poor quality primary care process leads to unnecessary hospitalization and reliance on emergency departments, often putting patients at further risk. Focusing on the primary care part of the system is likely to affect the most patients and address the most significant disparities.

The quality of care in the primary care setting relies heavily on adequate networking with specialists and following best-practice guidelines. Focused initiatives are likely to be most successful. Two promising ways to focus are: (1) on disease categories for which best practices can be defined, e.g., diabetes and the broader category of metabolic syndrome disease; and (2) on improving access to and the quality of physician-patient interaction in the "medical home" — a setting in which issues of prevention, screening, and treatment can and should be initiated.

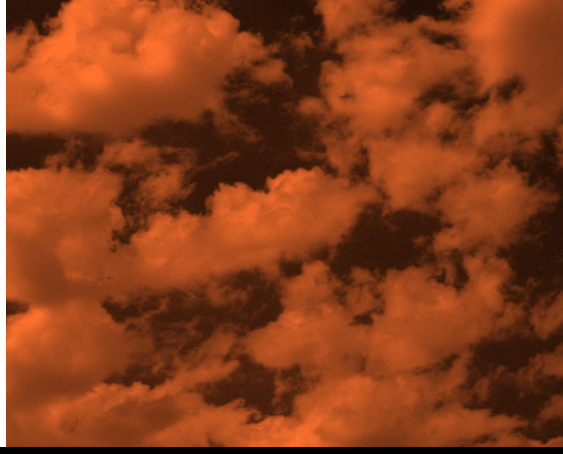
These issues are discussed further in Chapter 11, Findings and Recommendations, Focus Area 2: Diabetes and Metabolic Syndrome Conditions, and Focus Area 3: The Medical Home Concept.

Connecticut lacks an agreed-upon overall "index" that would assist the public in knowing whether health care quality is improving or not improving. Developing such an index could be an important, although a long-term priority. Subparts of the index could indicate sectors that are leading or lagging in improvement. The index also could be constructed to reveal disparities in the quality of care, with adequate controls for appropriateness of care, patient choice, and co-morbidities. The AHRQ has investigated use of this concept on the national level.[142]

Finally, there are major discrepancies between adverse event results reported by law to DPH and estimates based on other research. Part of the work of developing a broadly accepted index should be to understand better the reasons for these differences, and to make appropriate adjustments.

CHAPTER 8

Environmental Health



CHAPTER 8

ENVIRONMENTAL HEALTH

ENVIRONMENTAL HEALTH

Air Quality

- Outdoor air quality
- Air quality monitoring and trends
- Ozone
- Air quality index
- Particulate matter
- Causes of poor air quality

Water Quality

- Safe drinking water act
- Public water systems
- Public water supply violations
- Lead
- Private wells
- Surface and groundwater protection
  - Water quality classifications
  - Fish advisories

Human health is directly related to the quality of our air and water. Poor air quality can exacerbate respiratory conditions, especially in vulnerable populations. Poor water quality can lead to water-borne illnesses or cancer. This chapter discusses the human health issues of air and water quality in Connecticut.

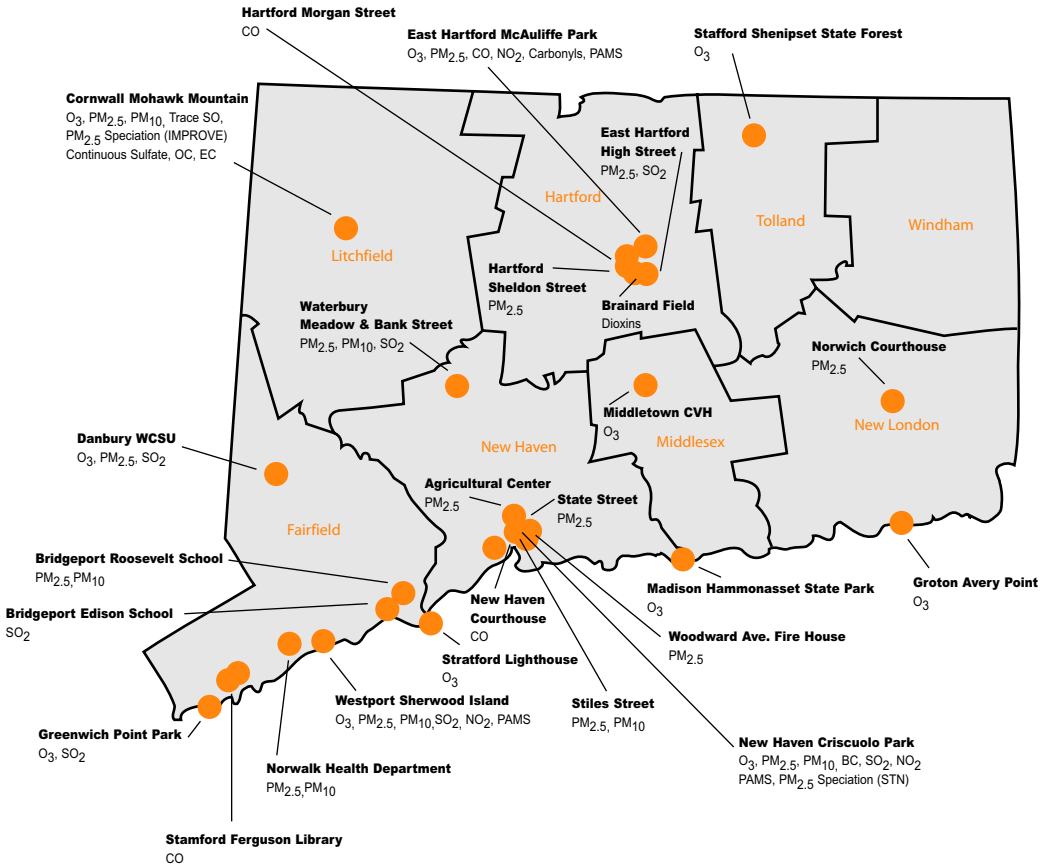
OUTDOOR AIR QUALITY

Air quality is threatened by a variety of pollutants emitted from vehicles, factories, power plants, fires, and tobacco smoke. Pollutants that are considered harmful to human health and the environment are regulated by the Clean Air Act, which is administered by the U.S. Environmental Protection Agency (EPA). The EPA sets National Ambient Air Quality Standards (NAAQS) to protect public health. Primary standards protect healthy citizens as well as vulnerable populations such as children, asthmatics, and the elderly.[143]

Under the Clean Air Act, states are mandated to monitor their ambient air quality and determine whether it meets the EPA's standards for the following criteria air pollutants: ground-level ozone (O_3), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (including PM_{10} and $PM_{2.5}$ — see definitions under the Particulate Matter section). If air quality does not meet a particular standard, states are mandated to develop and implement pollution control strategies to attain the standard.

Connecticut began monitoring particulate matter in the 1950s, even before the Clean Air Act. In the 1970s, the state initiated a computerized network for daily monitoring. Today, the Connecticut Department of Environmental Protection (DEP) monitors air pollutants at 26 permanent monitoring stations.[144]

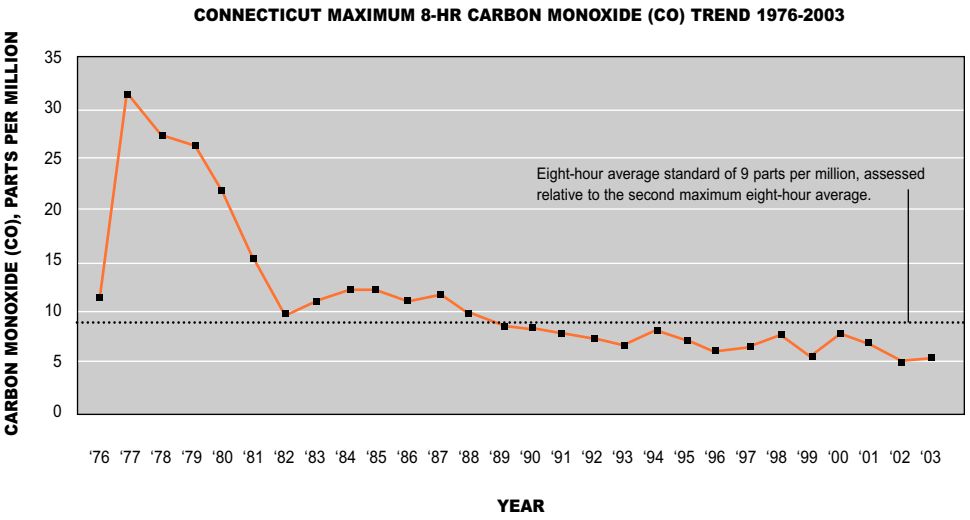
FIGURE 21: CONNECTICUT 2005 AIR MONITORING NETWORK

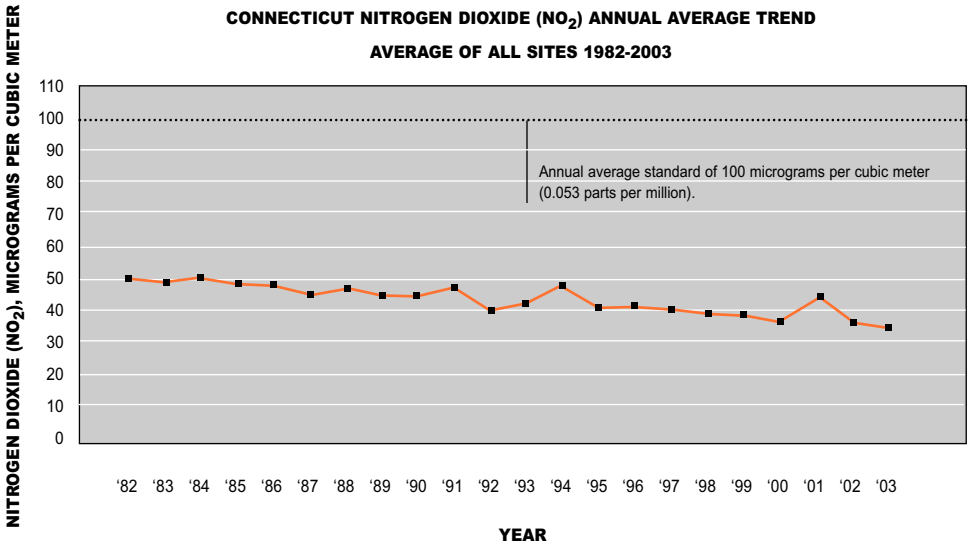


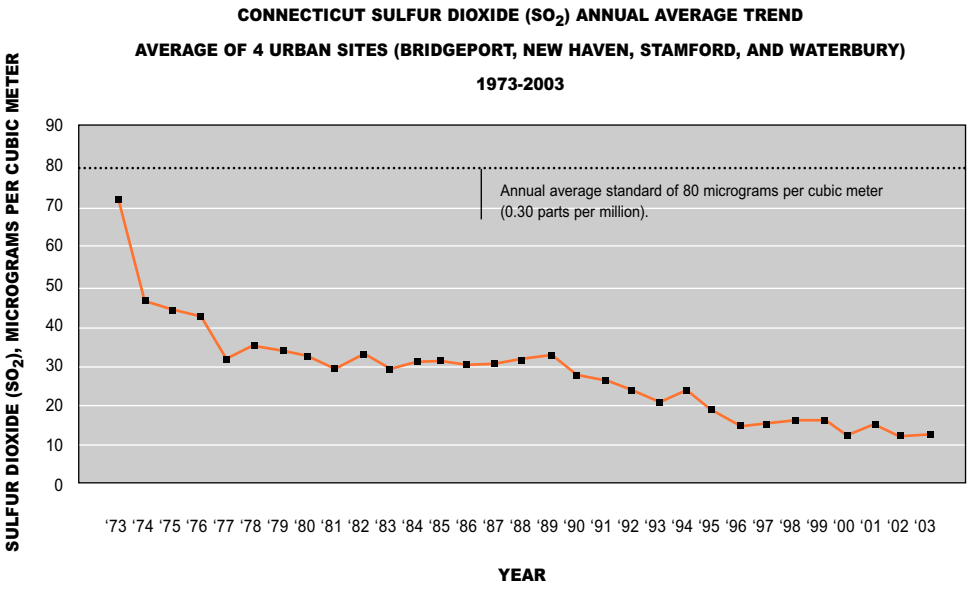
Source: DEP. Available at: http://www.ct.gov/dep/lib/dep/air_monitoring/networkmap.pdf.

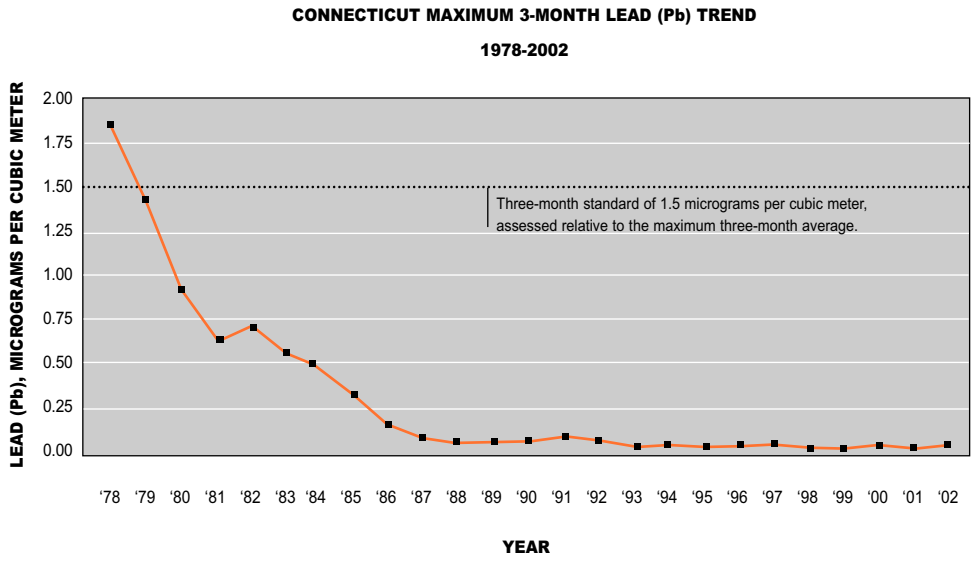
Air pollutants have decreased significantly in Connecticut over the last 20 years. The greatest success story has been a 93 percent decline in ambient levels of lead resulting from the phasing out of leaded gasoline by the EPA in 1973.[145] The 1980s introduction of catalytic converters in automobiles, the state vehicle inspection program and new air pollution control technologies for factories significantly reduced ambient levels of air pollutants. Since 1975, sulfur dioxide and carbon monoxide levels have decreased by 66 percent, nitrogen dioxide levels have fallen by 45 percent, ozone levels have declined by 60 percent, and particulate matter (PM_{10}) has declined by 93 percent.[146]

FIGURE 22: CONNECTICUT AIR QUALITY TRENDS (THROUGH 2003)









Source: DEP. Available at: http://dep.state.ct.us/airmonitoring/trends.htm.

Connecticut today is in compliance with NAAQS for all criteria pollutants except ozone level for the entire state and particulate matter level for Fairfield and New Haven counties.

Ozone

Ground-level ozone ("smog") is more difficult to regulate than other air pollutants because it is formed when volatile organic compounds (VOCs), or hydrocarbons, and nitrogen oxides interact in the presence of sunlight on hot days. Exhaust — from automobiles, trucks, aircraft, and construction equipment — is a major contributor of VOCs and nitrogen oxides to the atmosphere. Chemical manufacturers and power plants burning fossil fuels are also major sources.[147] High ozone concentrations in Connecticut typically occur on hot summer days, as surface winds blow in from mid-Atlantic urban areas and power plants in the Ohio Valley. When these sources combine with more localized emissions from vehicles, industry, and commerce, smog reaches an unhealthy level.[148]

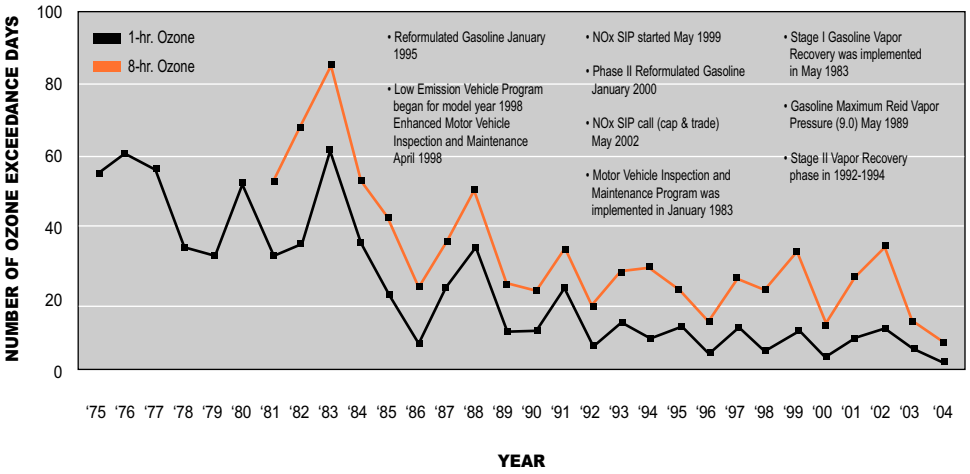
Smog can cause a variety of respiratory ailments from irritation to permanent lung damage. By irritating the respiratory system, ozone can cause coughing, throat irritation or uncomfortable chest sensations. Prolonged exposure to ozone through outdoor physical activity can cause shortness of breath. Ozone can also aggravate asthma attacks because it makes people more sensitive to allergens.

People with chronic lung illness, children and elders are particularly susceptible to elevated ozone levels. Individuals with chronic lung diseases, such as emphysema and bronchitis, who are exposed to high ozone levels are less capable of fighting off bacterial infections in the respiratory system. Consistent ozone damage to children's lungs, which are still developing, can lead to decreased lung function in adulthood. Among elders, ozone exposure can accelerate lung dysfunction.

The effects of ozone can be deceiving because there may be prolonged lung damage even though symptoms of irritation often disappear within several days of exposure.[149]

Connecticut has exceeded the EPA's smog standards less and less often over the past 30 years. Since implementing statewide emission reduction programs for automobiles, fuels and stationary sources of ozone's ingredients, the state has reduced the number of days it exceeds these standards to fewer than 10 over the past two years. Warm, dry summer weather conditions and stagnant air patterns are mainly to blame for violations of ozone standards. This explains why there is large variability from year to year, as weather patterns vary.[150]

FIGURE 23: CONNECTICUT 1-HR AND 8-HR OZONE EXCEEDENCE DAYS TREND (1975-2004)



Source: DEP. Available at: http://dep.state.ct.us/airmonitoring/trends/ozonetrends.htm.

Particulate Matter

Particulate matter is the mixture of solid particles and water droplets in the air. Coarse particles (PM_{10}) are larger than 10 micrometers in diameter and are derived from wind-caused erosion or industry. Fine particles ($PM_{2.5}$) are less than 2.5 micrometers in diameter and are produced from fuel combustion in power plants, vehicles and industrial processes.

Fine particles are a particular health concern even at levels below existing air quality standards because they can penetrate deep into the lungs and cause long-term damage. Long-term exposure to elevated levels of particulate matter can cause such chronic health problems as reduced lung function, bronchitis and even early death. Short-term exposures can cause asthmatic attacks, respiratory infections, acute bronchitis, and heart attacks in people with heart disease.[151]

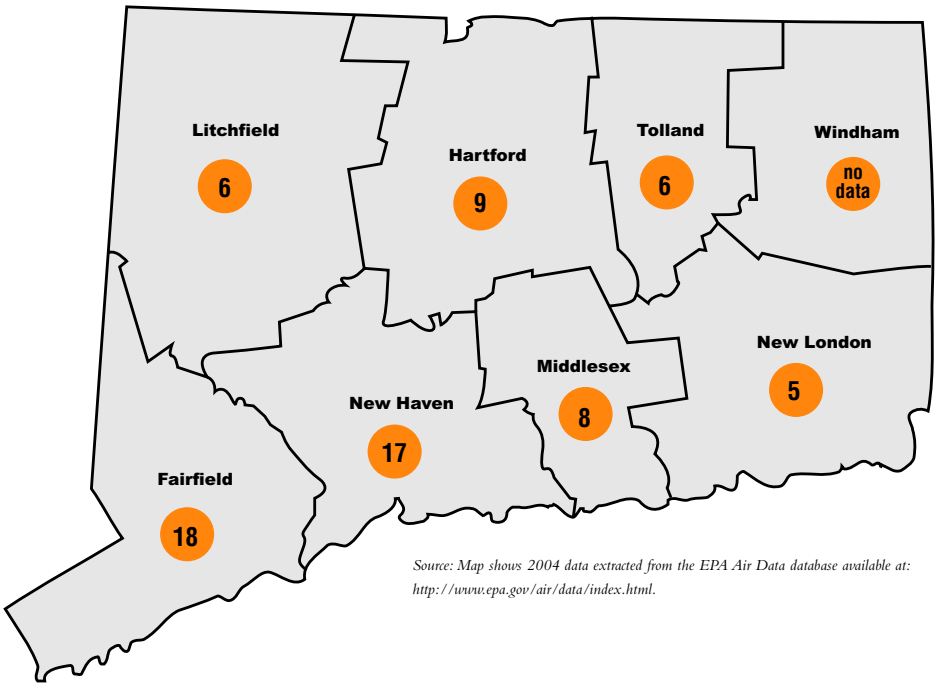
Air Quality Index

The EPA has established an overall index, called the Air Quality Index (AQI), to report daily air quality conditions and their associated health effects. The AQI is a comprehensive indicator of overall air quality because it evaluates air quality based on five criteria air pollutants: ground-level ozone (smog), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide, sulfur dioxide, and nitrogen dioxide. The AQI ranges from 0 to 500, where values up to 50 represent good air quality. Values greater than 100 are harmful to sensitive populations, and those over 150 are unhealthy for all populations. The air is very unhealthy when the index exceeds 200.[152]

The AQI can vary from one season to another. Typically, the higher smog levels of summer produce the highest AQI values. But air quality in the winter also can be unhealthy because cold weather affects car emission control systems, which raises carbon monoxide levels. Particulate matter can cause unhealthy air conditions during any season.

Larger cities typically have more severe air pollution problems. Most communities typically have AQI values below 100 and experience levels above 100 only a few times a year. There are not many values above 200, and those over 300 are very rare.[153]

FIGURE 24: AVERAGE NUMBER OF DAYS WITH UNHEALTHY AIR QUALITY 2000 TO 2005



Source: Map shows 2004 data extracted from the EPA Air Data database available at: http://www.epa.gov/air/data/index.html.

Between 2000 and 2005, New Haven and Fairfield counties had on average 17 and 18 days, respectively, with an AQI above 100. In 2005 the AQI reached unhealthy levels for the general public (AQI > 150) in four out of the seven counties reporting data for one to five days: — Fairfield, New Haven, Middlesex, and Tolland. Between 2000 and 2003, very unhealthy air quality conditions (AQI ≥ 200) occurred with a frequency of one to three days each year.[154] These few occurrences stand out as being extraordinarily poor air conditions when compared with nationwide statistics.

Causes of Poor Air Quality

The EPA's air quality data for 2005 show that particulate matter ($PM_{2.5}$) is more frequently responsible for causing the AQI to reach moderate levels, between 50 and 100, in New York counties close to New York City,[155] and in Fairfield, Hartford, and New Haven counties in Connecticut.[156] Ground-level ozone (smog) was responsible for 100 percent of the unhealthy air conditions in both Middlesex and Tolland counties. It caused most of the poor air quality in New London and Litchfield counties. During the last six years, for every case where the AQI reached unhealthy conditions for the general public (AQI > 150), ground-level ozone (smog) was the cause.[157]

TABLE 96: PERCENTAGE OF DAYS PARTICULAR AIR QUALITY CRITERIA VIOLATED, BY COUNTY, 2005

COUNTY	Percentage of days that a particular Criteria Air Pollutant was responsible for high Air Quality Index					
	CO	NO_2	O_3	SO_2	$PM_{2.5}$	PM_{10}
Fairfield	4	0	34	0.3	61	0.3
Hartford	3	0	19	0	78	0
Litchfield	0	0	59	0	41	0
Middlesex	0	0	100	0	0	0
New Haven	0	0	22	0	78	0
New London	0	0	70	0	30	0
Tolland	0	0	100	0	0	0

Source: EPA Air Quality System (AQS). Data extract for Connecticut, 2004.

WATER QUALITY

Safe Drinking Water Act

The EPA administers the 1974 federal Safe Drinking Water Act to ensure that public (and potential) drinking water supplies meet standards that are safe for public health. All public water systems that provide water to at least 15 connections, or 25 people, for at least 60 days of the year, are required to meet the EPA's water quality standards.[158]

The Connecticut Department of Public Health's (DPH) Drinking Water Section (DWS) is responsible for overseeing state and federal drinking water regulations by monitoring water quality, protecting drinking water sources to ensure adequate supply and quality, and providing educational outreach to citizens.[159]

Public Water Systems

Connecticut has 2,956 public water systems that must meet the EPA's water quality standards. There are two types of public water systems: community and noncommunity. Connecticut has 583 community water systems, which are residential systems that supply at least 25 people throughout the year. Community systems serve about 79 percent of Connecticut's population.[160]

The remaining 21 percent of the population relies on private water supplies, such as wells. In comparison, 15 percent of all Americans rely on private drinking water supplies.[161] More than 66 percent of Connecticut's population on community public water supplies receive water from surface waters. Groundwater serves the rest of the community water supplies and nearly all of the noncommunity water systems.[162]

Noncommunity water supplies that are regulated by the DWS are classified into nontransient and transient systems. Nontransient water systems supply water to at least 25 people on a regular basis for at least six months of the year — including day care centers, schools and businesses that employ more than 25 people. Connecticut has 653 nontransient, noncommunity public water systems.

Transient water systems supply water to at least 25 people, other than year-round residents, for at least 60 days of the year. Transient systems include restaurants, state parks, highway rest areas, and gas stations. Connecticut has approximately 1,720 establishments that fall in this category. [163,164]

The EPA has set health-based standards, called Maximum Contaminant Levels (MCL), for more than 90 different water contaminants.[165] The DWS requires all owners of public water systems to submit water samples for testing on a regular basis and report the results to assess compliance. The frequency and types of contaminants that are tested vary according to how many people are served, the contaminant group and whether the water supply comes from surface or groundwater.

Community public water systems must test for all microbial, chemical, and radionuclide contaminants that are regulated by EPA.[166] Community water systems also test for contaminants that are not currently regulated by the EPA to help EPA develop new standards.[167] Nontransient, noncommunity systems are required to test for all microbial and chemical contaminants. Transient, noncommunity systems are only required to test for microbial contaminants in addition to nitrates and nitrites.[168]

Public Water Supply Violations

Most public water system violations in Connecticut occur in small systems that serve fewer than 1,000 people. DWS is devoting more attention to identifying and regulating noncommunity public water systems. Consequently, they are finding more maximum contaminant level violations than they have in the past in these newly-regulated small systems.

In 2004, 241 public water systems (roughly 8 percent of the public water systems) received 406 violation notices for exceeding maximum contaminant levels. Fifty-five community systems and 186 noncommunity systems were responsible for the violations. When violations occur, DWS works with water suppliers to help bring them back into compliance.[169]

Approximately 82 percent of the 406 violations were caused by high levels of total coliform bacteria, which occur naturally and are not necessarily harmful to human health. But high total coliform counts often indicate a problem with the purification system that needs to be corrected. Nearly 6 percent of the violations were identified as acute total coliform violations because fecal coliform (E. coli) bacteria were detected. These bacteria indicate contamination from sewage or animal wastes.[170]

The remaining 12 percent of the public water system violations in 2004 were caused by high levels of chemical contaminants that could cause significant health risks with prolonged exposure.[171] Table 141 in Appendix J provides details on MCL violations.

Several chemical violations in 2004 were caused by high levels of radium and uranium. In Connecticut, uranium can occur naturally in groundwater when it dissolves bedrock, causing deep water wells to be contaminated with uranium and radium. For the most part, uranium is eliminated from the body when it is ingested, but it can cause kidney damage. Radium is a byproduct of uranium when it breaks down in the environment.[172]

Lead

Lead is known to be harmful to human health when ingested or inhaled. Its effects are especially serious in children, causing irreversible damage to mental and physical development. At high exposure levels, lead can cause severe neurological damage and even death to children or adults. Lead absorption occurs much faster in children than in adults.[173]

The EPA recommends that citizens take action when the level of lead contamination is 15 parts per billion (ppb) or higher, which is equivalent to 15 micrograms per liter. At this level, EPA recommends reducing exposure to lead in drinking water, especially if there are children in the household.[174]

Ten to 20 percent of lead exposure in adults is believed to come from drinking water. As much as 60 percent of total exposure to lead for infants is from drinking water because an infant's diet is composed primarily of water-based liquids.

Private wells

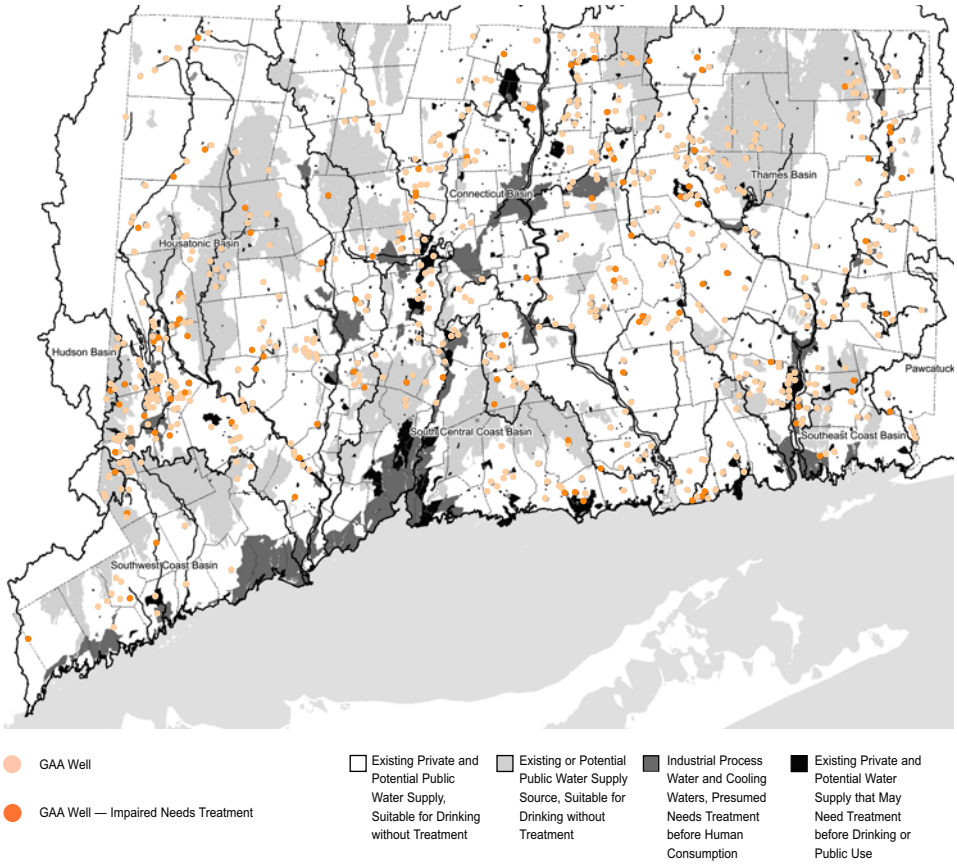
As much as 21 percent of Connecticut's population relies on private drinking water supplies. Private drinking water wells are at the most risk from hazardous sites and contamination because their water is usually not regularly tested. This is why residents with private water supplies are urged to test their drinking water wells periodically for contaminants. These include total coliform bacteria, nitrate, and volatile organic compounds, which include gasoline and MtBE, a gasoline additive.

Surface and groundwater protection

The quality of drinking water depends on the surrounding land uses and maintenance of drinking water source areas. Connecticut has recognized that it must protect source waters from pollution to protect drinking water over the long term. In 2003, DWS and the DEP completed a statewide assessment of all public drinking water supply sources to determine their susceptibility to possible contamination sources.

Connecticut has more than 150 reservoirs and more than 4,000 groundwater wells that supply drinking water. Identifying and mapping source water areas is an extraordinary achievement for the state, because it enables local government and public health officials to create drinking water source protection initiatives such as protective zoning, land acquisition of source areas, and best practices for managing hazardous materials.[175]

FIGURE 25: GROUNDWATER CLASSIFICATIONS WITH MAJOR BASINS



Source: DEP: Major Basins Groundwater Quality Classification adopted in 1997 and last updated November 2004; UCONN Libraries Map and Geographic Information Center: Town Boundaries.

Source areas for large community wells in sand and gravel aquifers are subject to Aquifer Protection Program regulations,[176] whereas the source areas for smaller bedrock wells are defined by a radius around the well that is proportional to its pumping rate. Connecticut has inventoried all potential contaminant sources within the source areas for each public water supply and has found low to moderate susceptibility to contamination for most public drinking water systems.

The inventory found that contamination susceptibility decreased in source water areas with less urbanization and more preserved land. Most (over 60 percent) of the potential hazards to surface and groundwater supplies for drinking water come from automotive sources, such as underground fuel storage tanks, automobile repair, and sales facilities, and facilities that generate hazardous waste. Potential contamination of drinking water source areas can also come from pesticides and herbicides, agricultural animal wastes, industrial manufacturing of chemicals, hazardous and solid waste sites, highways, oil or chemical pipelines, and failing septic systems.[177] A list of contaminated or potentially contaminated sites in Connecticut is available at http://www.dep.state.ct.us/wst/remediation/sites/sites.htm.

WATER QUALITY CLASSIFICATIONS

Groundwater

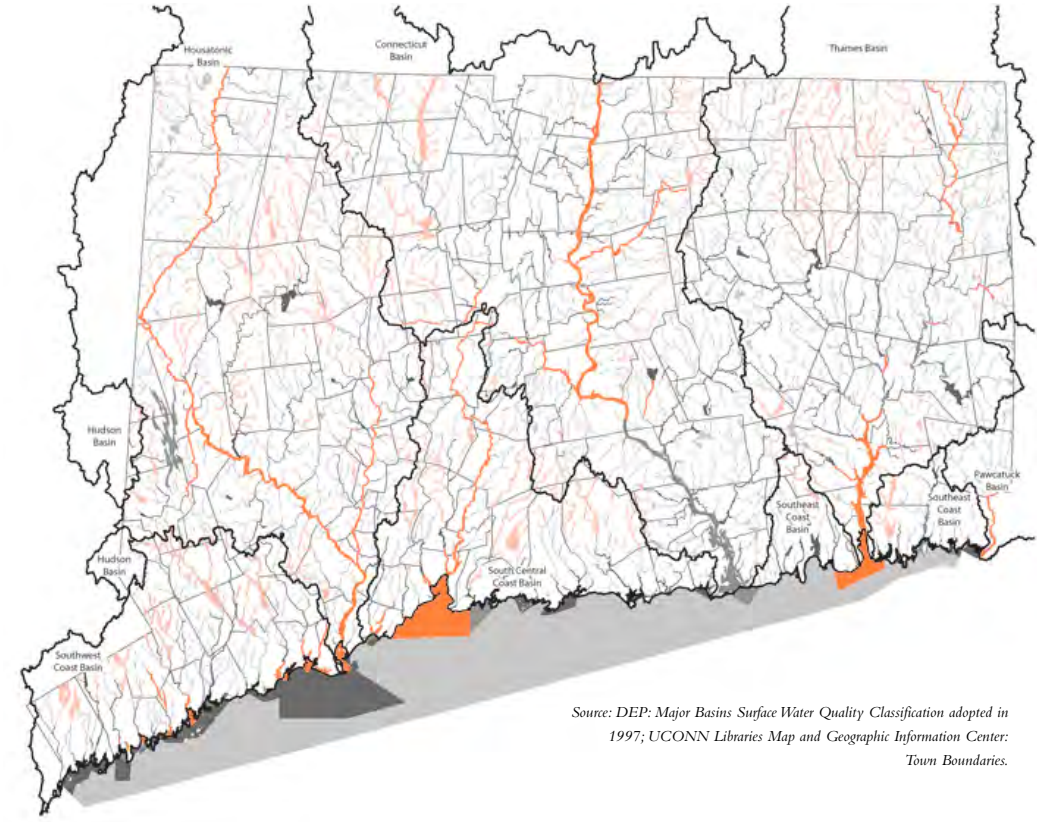
Figure 25 shows that approximately 90 percent of the state has groundwater quality (GA — existing private and potential public or private supplies of water or GAA — groundwater used or which may be used for public supplies) that is suitable for drinking without treatment. About 6 percent of the land area is classified as GB, presumed to need treatment before human consumption, because, historically, water in these areas was used in industrial processes and for cooling industrial plants.[178]

Only a few areas are classified as GA Impaired or GAA Impaired, meaning there is a private or potential water supply in these regions that would need treatment prior to being used for a public water supply. A few of the towns that stand out as having impaired groundwater classifications and public wells are: Montville, East Lyme, Clinton, Coventry, Enfield, and Plainville.[179]

Surface water

Most of Connecticut's smaller streams have water quality levels that meet their targeted usage. Several of the state's larger rivers have reaches where the water quality does not meet its targeted classification (see Figure 26). These rivers are classified as either Class C or D. Class C surface waters experience intermittent problems with water quality such as problems associated with overflows from combined sewer systems. Class D surface waters have persistent problems such as the polychlorinated biphenyl (PCB) contamination that occurs in the Housatonic River sediments.[180] The rivers with unacceptable water quality include the Housatonic, lower reaches of the Quinnipiac, upper reaches of the Connecticut, the Hockanum, the lower reaches of the Thames, and the headwaters of the Quinebaug. Water quality at the outlet of the Quinnipiac and the Thames is not acceptable enough to support shellfish harvesting.[181]

FIGURE 26: SURFACE WATER QUALITY



Source: DEP: Major Basins Surface Water Quality Classification adopted in 1997; UCONN Libraries Map and Geographic Information Center: Town Boundaries.

A, SA - Potential Drinking water supply, Fish & Wildlife Habitat, Recreation, and Shellfish Harvesting Areas for Human Consumption

AA, A/AA - Existing or Proposed Drinking Water Supply; Fish and Wildlife Habitat; Recreational Use and Not Meeting Criteria for Target Use

B, B*,SB - Water Use Intended for Fish and Wildlife, Recreation, or Navigation and is meeting Target Use

B/A, B/AA, C/A, SB/SA, SC/SA, SD/SA - Water Use Intended for Fish and Wildlife, Recreation, or Navigation and is not Meeting Criteria for Target Class; Shellfish require processing prior to consumption

C/B, D/B, SC/SB, SD/SB - Indicates Unacceptable Quality and Shellfish Harvesting Not Supported where the Goal is Class B or A

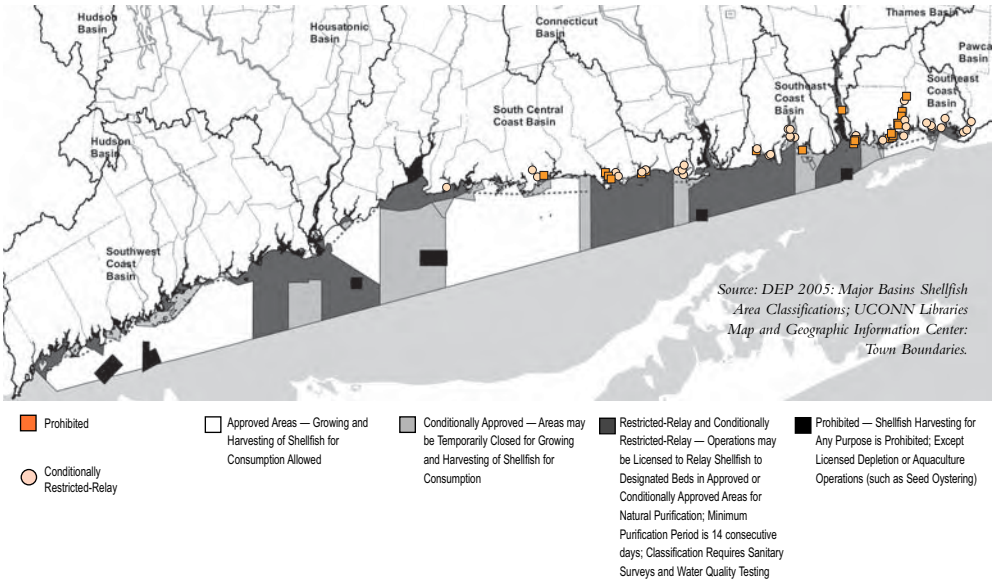
Coastal water

One indicator of coastal water quality is its ability to sustain shellfish that are safe for human consumption. The Connecticut Department of Agriculture (DOA) Bureau of Aquaculture oversees the classification of shellfish harvesting areas to minimize health risks from eating contaminated shellfish. A shellfish growing area is any area that supports, or could support, the production of mollusks, which include mussels, oysters, scallops, and clams. Shellfish areas are at risk from a variety of contaminants such as sewage, chemicals, petroleum spills, or hazardous algal blooms.[182]

Figure 27 shows that shellfish harvesting is prohibited in several of Connecticut's small bays and major river outlets, including the outlets of the Housatonic, Quinnipiac, Connecticut, and Thames rivers. Many other areas are classified as Restricted-Relay and Conditionally Restricted-Relay, which means that shellfish may be relocated to other areas to undergo a natural purification process prior to marketing them for human consumption.[183]

Several coastal areas close to shore and farther offshore from the towns of Fairfield, Bridgeport, Stratford, West Haven, East Haven, Branford, Clinton, Westbrook, Old Saybrook, Old Lyme, East Lyme, New London, Groton, and Stonington have Restricted-Relay classifications for shellfish areas. There are fully approved shellfish harvesting areas off the coasts of Stonington, Madison, Guilford, Branford, Milford, Stratford, and farther offshore from Westport, Norwalk, Darien, Stamford, and Greenwich.

FIGURE 27: SHELLFISH AREA CLASSIFICATIONS



FISH ADVISORIES

Impaired surface waters directly affect the flora and fauna in these waters and can thereby indirectly impact human health. Some fish that live in contaminated waters have a tendency to take up hazardous chemicals, such as mercury and polychlorinated biphenyls (PCBs). Repeated consumption of contaminated fish has bioaccumulative effects on humans, meaning that the chemicals can build up in body tissue and cause damage to the nervous system or increased risk of cancer. Pregnant women, nursing mothers, women planning on a pregnancy within a year, and children under age 6 are particularly at risk, because these chemicals can affect brain development in fetuses, infants, and children.[184]

Most freshwater fish in Connecticut warrant an advisory on consumption due to high levels of mercury. Individuals who are in a high-risk category are advised not to eat freshwater fish from Connecticut's water bodies more than once per month, and low risk individuals are advised not to eat more than one meal per week. For the most part, the only freshwater fish in Connecticut that are safe to eat are freshwater trout, with the exception of trout from the Housatonic River above Derby Dam and Furnace Brook in Cornwall due to high levels of PCBs.[185]

DPH recommends that even low-risk individuals should not eat fish at all from the following water bodies: Housatonic River above Derby Dam (PCBs), Quinnipiac River above Quinnipiac Gorge (PCBs), Eight Mile River in Southington (PCBs), Brewster Pond in Stratford (Chlordane), and Union Pond in Manchester (Chlordane). There are fish advisories for the saltwater species striped bass and bluefish from Long Island Sound and its connected rivers, because of PCB contamination. [186]

CHAPTER 9

Health Outcomes: Health Status, Disease Incidence, Hospitalization, and Mortality

CHAPTER 9

HEALTH OUTCOMES: HEALTH STATUS, DISEASE INCIDENCE, HOSPITALIZATION, AND MORTALITY

Of the many possible indicators of health outcome, the following are included in this report:

- Health status
- Disease incidence
- Hospitalization
- Emergency department utilization (ED)
- Mortality

SELF-REPORTED HEALTH STATUS

Self-reported health status is a strong predictor of future illness, death, and use of health care.[187] Physical and mental health are both important components of health status.

Twelve percent of state residents reported their health to be fair or poor, according to the Behavioral Risk Factor Surveillance System (BRFSS) surveys of adults 18 years old and older that were conducted between 1999 and 2003, reported in Table 97. Eight percent reported having 15 or more days of poor physical health in the past month, and 8 percent reported 15 or more days of poor mental health in the past month.

There were differences in self-reported health status by Health Reference Groups (HRGs), adjusted for age differences. Although more than one-fifth of residents in the Urban Centers reported that their overall health was fair or poor, only 8 percent of residents in the Wealthy Suburbs and 9 percent of residents in the Rural Towns reported fair or poor overall health.

Residents in the Urban Centers were also much more likely to report poor physical health (Table 98) and poor mental health (Table 99) than residents in the Manufacturing Centers and Wealthy Suburbs. Self-report of poor physical health was also high in the Manufacturing Centers, while poor mental health was relatively high in the Diverse Suburbs.

Hispanic respondents were more likely than white or black respondents to report fair or poor health. This difference was most evident for residents in the Urban and Manufacturing centers. Asian respondents were the least likely to report fair or poor overall health. They were also least likely to report 15 or more days of poor physical health or poor mental health.

TABLE 97: PERCENTAGE REPORTING FAIR OR POOR OVERALL HEALTH

AREA	All Race and Ethnicity, Crude Percentage	All Race and Ethnicity, Age-Adjusted Percentage	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
Bridgeport	22.6	23.8	18.9	18.4	35.2	
Hartford	18.8	20.3	14.0	16.2	35.8	
New Haven	17.6	19.3	13.4	21.7	33.2	
HRG 1 (3)-UC	19.6	21.0	14.9	19.0	35.0	
HRG 2 (10)-MC	15.1	15.3	12.0	19.0	30.4	7.0
HRG 3 (15)-DS	13.1	12.5	11.8	18.1	16.9	
HRG 4 (27)-WS	7.1	6.6	5.7		22.8	
HRG 5 (39)-MT	11.9	11.3	11.1	12.8	17.6	5.0
HRG 6 (75)-RT	8.9	8.7	8.4		15.6	
Connecticut	12.3	12.0	10.1	18.0	28.3	6.2
United States	14.0	14.0				

Source: Connecticut Department of Public Health BRFSS Survey Data, 1999-2003; Centers for Disease Control and Prevention BRFSS web site. Available at: www.cdc.gov/brfss. Average of medians of states — 1999-2003.
Note: All race and ethnicity specific rates are age-adjusted.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

TABLE 98: PERCENTAGE REPORTING POOR PHYSICAL HEALTH 15 OR MORE DAYS IN PAST MONTH

AREA	All Race and Ethnicity, Crude Percentage	All Race and Ethnicity, Age-Adjusted Percentage	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
Bridgeport	9.6	10.2	9.7	9.5	9.7	
Hartford	8.8	9.5	8.5	11.2	8.1	
New Haven	7.6	8.6	7.3	8.2	12.8	
HRG 1 (3)-UC	8.6	9.4	8.2	10.0	9.4	
HRG 2 (10)-MC	9.7	9.9	8.9	8.5	17.2	4.3
HRG 3 (15)-DS	8.4	8.1	8.0	9.8	8.2	
HRG 4 (27)-WS	5.3	5.0	4.9		7.4	
HRG 5 (39)-MT	8.4	8.0	7.9	10.5	12.9	4.7
HRG 6 (75)-RT	7.1	6.8	6.5		10.1	
Connecticut	8.0	7.8	7.3	9.6	12.0	5.1
United States	8.8	8.8				

Source: DPH BRFSS Survey Data, 1999-2003; CDC BRFSS web site. Available at: www.cdc.gov/brfss.
Note: All race and ethnicity specific rates are age-adjusted.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

TABLE 99: PERCENTAGE REPORTING POOR MENTAL HEALTH 15 OR MORE DAYS IN PAST MONTH

AREA	All Race and Ethnicity, Crude Percentage	All Race and Ethnicity, Age-Adjusted Percentage	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
Bridgeport	12.1	12.1	9.8	12.8	13.4	
Hartford	8.8	8.5	8.6	5.4	8.9	
New Haven	9.2	9.5	9.7	9.8	15.3	
HRG 1 (3)-UC	10.0	10.0	9.4	10.0	11.3	
HRG 2 (10)-MC	8.6	8.6	9.6	6.9	10.2	2.7
HRG 3 (15)-DS	9.2	9.2	9.1	13.9	10.0	
HRG 4 (27)-WS	6.1	6.1	6.1		8.4	
HRG 5 (39)-MT	8.5	8.6	8.6	6.2	9.5	5.5
HRG 6 (75)-RT	6.8	7.0	6.8		9.3	
Connecticut	8.1	8.2	8.1	9.2	10.3	4.6
United States	9.1	9.1				

Source: DPH BRFSS Survey Data, 1999-2003; CDC BRFSS web site. Available at: www.cdc.gov/brfss.
Note: All race and ethnicity specific rates are age-adjusted.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

Self-Reported Health Summary

Self-reported overall health and physical health is lowest in the Urban Centers, as summarized in Table 100. Poor mental health shows a more variable pattern. The communities in the Wealthy Suburbs group have the most favorable self-reported health on all three indicators.

TABLE 100: AGE-ADJUSTED PERCENTAGES OF PERSONS 18 AND OVER WITH SELECTED SELF-REPORTED HEALTH LEVELS, BY HRG, BRFSS SURVEYS 1999-2003

AREA	Fair or Poor Overall Health	Poor Physical Health 15 or More Days in Past Month	Poor Mental Health 15 or More Days in Past Month
Urban Centers (3)	21.0	9.4	10.0
Manufacturing Centers (10)	15.3	9.9	8.6
Diverse Suburbs (15)	12.5	8.1	9.2
Wealthy Suburbs (27)	6.6	5.0	6.1
Mill Towns (39)	11.3	8.0	8.6
Rural Towns (75)	8.7	6.8	7.0
Connecticut (169)	12.0	7.8	8.2

Source: DPH BRFSS Survey Data, 1999-2003.

DISEASE INCIDENCE

ASTHMA

Asthma is the seventh-ranked chronic health condition in the United States, causing almost 500,000 hospitalizations and 5,000 deaths per year. Asthma-related health care costs are estimated at $14.5 billion a year. The incidence of asthma, asthma-related health care costs, and deaths due to asthma increases each year.[188]

Overall, 12.4 percent of Connecticut adults report ever being diagnosed with asthma (Table 101), and 8.3 percent report currently having asthma, as shown in Table 102. Prevalence of both lifetime and current asthma was highest in the Urban Centers and lowest in the Wealthy Suburbs. Sample sizes were insufficient to detect differences in asthma prevalence by city.

Prevalence of lifetime and current asthma was similar among white, black and Hispanic respondents, but it was somewhat lower among Asian respondents. While the asthma prevalence among Hispanics was similar to that of whites and blacks in the Urban and Manufacturing centers and Diverse Suburbs, the prevalence of lifetime and current asthma was lower among Hispanics in the Wealthy Suburbs than among whites.

TABLE 101: PERCENTAGE EVER TOLD THEY HAD ASTHMA

AREA	All Race and Ethnicity, Crude Percentage	All Race and Ethnicity, Age-Adjusted Percentage	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
Bridgeport	14.9	14.4	18.9	7.5	16.2	
Hartford	15.5	15.3	14.8	16.6	17.7	
New Haven	14.9	15.2	16.1	21.1	8.1	
HRG 1 (3)-UC	15.1	14.8	16.3	14.4	15.2	
HRG 2 (10)-MC	12.6	12.7	12.3	14.0	14.8	6.1
HRG 3 (15)-DS	13.2	13.5	13.6	13.4	13.8	
HRG 4 (27)-WS	10.1	11.1	11.8		4.3	
HRG 5 (39)-MT	11.5	11.8	11.7	12.6	18.6	9.3
HRG 6 (75)-RT	11.6	12.2	11.9		15.9	
Connecticut	12.1	12.4	12.4	13.9	14.1	8.1
United States	11.3	11.3				

Source: DPH BRFSS Survey Data, 1999-2003; CDC BRFSS web site. Available at: www.cdc.gov/brfss. Note: All race and ethnicity specific rates are age-adjusted.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

TABLE 102: PERCENTAGE WHO CURRENTLY HAVE ASTHMA

AREA	All Race and Ethnicity, Crude Percentage	All Race and Ethnicity, Age-Adjusted Percentage	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
Bridgeport	8.5	8.2	11.2	5.3	7.9	
Hartford	10.5	10.6	10.2	11.7	12.1	
New Haven	9.3	9.4	10.7	13.4	5.5	
HRG 1 (3)-UC	9.4	9.3	10.6	9.6	9.2	
HRG 2 (10)-MC	8.9	9.0	8.7	11.5	9.9	2.9
HRG 3 (15)-DS	9.1	9.3	8.9	11.4	12.0	
HRG 4 (27)-WS	5.9	6.2	6.6		1.8	
HRG 5 (39)-MT	8.3	8.6	8.9	6.3	10.2	5.3
HRG 6 (75)-RT	7.6	7.7	7.9		12.7	
Connecticut	8.1	8.3	8.3	10.1	9.0	4.7
United States	7.5	7.5				

Source: DPH BRFSS Survey Data, 1999-2003; CDC BRFSS web site. Available at: www.cdc.gov/brfss. Note: All race and ethnicity specific rates are age-adjusted.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

ARTHRITIS

Arthritis refers to a variety of disorders, the most common of which is osteoarthritis, or degenerative joint disease. Osteoarthritis, affecting mostly older people, results from the wearing away of the cartilage that covers the ends of bones in a joint, causing pain, swelling and loss of motion. Osteoarthritis affects more than 20 million people in the U.S., and is one of the most frequent causes of physical disability among adults.[189]

TABLE 103: SELF-REPORTED DIAGNOSIS OF ARTHRITIS, AGE 50 AND OVER

AREA	All Race and Ethnicity, Crude Rate	All Race and Ethnicity, Age-Adjusted Rate	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
HRG 1 (3)-UC	41.4	41.8	41.1	34.5		
Bridgeport	43.6	45.2				
Hartford	39.0	40.6				
New Haven	41.0	42.0	39.8			
HRG 2 (10)-MC	43.3	43.0	43.8			
HRG 3 (15)-DS	41.2	40.8	40.3			
HRG 4 (27)-WS	37.3	37.4	39.1			
HRG 5 (39)-MT	42.1	41.7	43.1			
HRG 6 (75)-RT	37.9	38.6	39.5			
Connecticut	40.4	41.1	40.9	41.2	43.6	41.9

Source: DPH BRFSS Survey Data, 1999-2003. Note: All race and ethnicity specific rates are age-adjusted.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

Overall, 40 percent of Connecticut adults age 50 and older reported being diagnosed with arthritis (Table 103). There were no statistically significant differences in the prevalence of arthritis by HRG or city. A similar percentage of white, black, Hispanic, and Asian respondents age 50 and older reported being diagnosed with arthritis.

OSTEOPOROSIS

Osteoporosis involves deterioration of bone tissue, leading to bone weakness and increased risk of fractures of the hip, spine and wrist. Although the disease affects both sexes, 68 percent of those with osteoporosis are women. This difference may be due in part to the older age distribution of women. Risk of osteoporosis is reduced among individuals with a lifetime diet high in calcium and vitamin D. Other risk factors for the disease include cigarette smoking and lack of exercise.[190]

Overall, almost 9 percent of women age 40 and older reported being told by a doctor that they had osteoporosis (Table 104). Although the prevalence of osteoporosis in this group appeared to vary by HRG, sample sizes were too small to detect statistically significant differences. Sample sizes were also insufficient to examine racial and ethnic differences in the prevalence of osteoporosis.

TABLE 104: SELF-REPORTED OSTEOPOROSIS, WOMEN 40 AND OVER

AREA	All Race and Ethnicity, Crude Rate	All Race and Ethnicity, Age-Adjusted Rate	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
HRG 1 (3)-UC	7.2	7.9				
Bridgeport						
Hartford						
New Haven						
HRG 2 (10)-MC	8.7	8.6	9.4			
HRG 3 (15)-DS	6.7	6.5	6.1			
HRG 4 (27)-WS	9.3	9.7	10.0			
HRG 5 (39)-MT	13.4	12.4	12.7			
HRG 6 (75)-RT	5.9	6.0	6.1			
Connecticut	8.6	8.6	8.9		7.7	

Source: DPH BRFSS Survey Data, 1999-2003. Note: All race and ethnicity specific rates are age-adjusted.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

DIABETES

Diabetes is a disease in which the body does not produce or properly use insulin. Type 2 diabetes, the most common type, may result in serious complications including heart disease, blindness, nerve damage, and kidney damage.[191] The *Healthy People 2010* initiative sets a target level of no more than 2.5 percent diabetic in the adult population.[192]

Over 5 percent of Connecticut residents reported having diabetes (Table 105). Diabetes prevalence varied by HRG. Residents in the Urban Centers had the highest prevalence of diabetes, more than twice that of residents living in the Wealthy Suburbs.

In the Urban and Manufacturing centers, the prevalence of diabetes was higher among black and Hispanic adults than among white adults. Sample sizes were insufficient to detect statically significant race and ethnicity differences in diabetes between the other HRGs and between the cities of the Urban Centers.

TABLE 105: PERCENTAGE TOLD THEY HAVE DIABETES

AREA	All Race and Ethnicity, Crude Percentage	All Race and Ethnicity, Age-Adjusted Percentage	White, Not Hispanic	Black, Not Hispanic	Hispanic	Asian, Not Hispanic
Bridgeport	8.7	9.9	10.1	8.8	9.8	
Hartford	7.6	8.7	7.6	10.4	8.4	
New Haven	7.2	8.5	4.8	16.3	10.5	
HRG 1 (3)-UC	7.8	9.0	7.2	12.2	9.1	
HRG 2 (10)-MC	5.8	6.0	5.3	10.3	9.5	6.4
HRG 3 (15)-DS	5.8	5.5	5.5	4.6	4.9	
HRG 4 (27)-WS	3.3	2.8	2.7		2.4	
HRG 5 (39)-MT	5.8	5.4	5.4	8.1	4.9	4.7
HRG 6 (75)-RT	4.6	4.4	4.2		11.5	
Connecticut	5.4	5.2	4.7	9.8	7.5	5.3
United States	6.3	6.3				

Source: DPH BRFSS Survey Data, 1999-2003; CDC BRFSS web site. Available at: www.cdc.gov/brfss. Note: All race and ethnicity specific rates are age-adjusted.
Blank cells indicate that data were not available due to small survey numbers or otherwise not calculated or available.

BIRTH WEIGHT

Birth weight is an important predictor of neonatal mortality and future health problems. Low birth weight (LBW) is less than 5 pounds, 8 ounces (2,500 grams) at birth. Very low birth weight (VLBW) is less than 3 pounds, 5 ounces (1,500 grams). There are two different forms of low birth weight: "preterm births" and "small-for-date babies." The latter are full-term babies who are below the weight guidelines.

Low birth weight affects about one in every 13 babies born each year in the United States, and it is a factor in 65 percent of infant deaths. Low birth weight babies may face serious health problems as newborns and are at increased risk of long-term disabilities.

The factors influencing low birth weight are only partly understood, and they include genetic or environmental conditions that limit normal development, as well as mothers' medical problems. Mothers' substance use and abuse has also been correlated with low birth weight.[193]

TABLE 106: PERCENTAGE LOW OR VERY LOW BIRTH WEIGHT, 1999-2003

AREA	All Race and Ethnicity	White, Not Hispanic	Black, Not Hispanic	Hispanic	Puerto Rican	Non-Puerto Rican Hispanic
HRG 1 (3)-UC	13.2	9.0	17.0	11.7	13.2	7.2
HRG 2 (10)-MC	9.8	8.0	16.7	9.7	12.6	6.3
HRG 3 (15)-DS	8.9	7.8	14.4	9.9	11.5	7.4
HRG 4 (27)-WS	6.6	6.8	14.8	5.4		
HRG 5 (39)-MT	8.2	8.1	15.0	9.3	12.5	5.5
HRG 6 (75)-RT	7.3	7.1	8.9	9.2		
Connecticut	9.1	7.6	16.3	10.3	12.8	6.5

Source: DPH.

Black non-Hispanics have the highest rate of low or very low birth weight, followed by Puerto Rican Hispanics, whites, and non-Puerto Rican Hispanics, whose rates for LBW or VLBW are slightly lower than those for whites in every HRG.

MORTALITY

Any health planning effort requires an examination of mortality patterns, but since mortality often reflects behavioral risks and chronic diseases developed over many years, mortality should be examined along with the risk behaviors and environmental conditions presented in other chapters of the *Data Scan*.

Since the populations being compared in the *Data Scan* are very different in age distribution (Hispanic and Asian populations are younger than the black population, which in turn is younger than the white population), crude mortality rates make for "unfair" comparisons. Age adjusting allows for fair comparisons among Connecticut mortality rates, as shown in Tables 107-111.

TABLE 107: ANNUALIZED CRUDE AND AGE-ADJUSTED MORTALITY PER 100,000 FROM ALL CAUSES, 2000-2004

AREA	Average Deaths Each Year	Crude Rate	Age-Adjusted Rate*
HRG 1 (3)-UC	3,250.4	844.8	945.9
Bridgeport	1,227.6	879.8	923.8
Hartford	987.0	811.8	971.7
New Haven	1,035.8	837.8	945.9
HRG 2 (10)-MC	5,913.0	892.7	792.0
HRG 3 (15)-DS	5,774.8	982.9	755.4
HRG 4 (27)-WS	3,653.4	749.2	655.7
HRG 5 (39)-MT	6,696.2	958.6	779.5
HRG 6 (75)-RT	4,418.6	755.6	727.7
Connecticut	29,733.0	873.1	763.7

Source: DPH Supplementary Table 9; U.S. Census 2000, SF1:Table P12.
**Standardized to the U.S. Population, 2000.*

TABLE 108: ANNUALIZED WHITE-ALONE, NOT HISPANIC ALL-CAUSE MORTALITY RATE PER 100,000, 2000-2004 — CRUDE RATE, AND AGE-ADJUSTED RATE

AREA	Average Deaths Each Year	Crude Rate	Age-Adjusted Rate
HRG 1 (3)-UC	1,792.0	1,646.8	912.0
Bridgeport	769.4	1,782.8	925.2
Hartford	410.2	1,892.3	944.6
New Haven	612.4	1,392.5	885.0
HRG 2 (10)-MC	5,026.6	1,206.7	789.0
HRG 3 (15)-DS	5,343.0	1,133.4	755.6
HRG 4 (27)-WS	3,551.6	785.0	658.0
HRG 5 (39)-MT	6,529.6	1,018.6	785.4
HRG 6 (75)-RT	4,330.6	789.4	732.9
Connecticut	26,573.6	1,007.0	750.3

Source: DPH Supplementary Table 9; U.S. Census 2000, SF1:Tables PCT012I. Standardized to the U.S. Population, 2000.
Note: White crude mortality rate is much higher than the age-adjusted rate because the white population is much older. Age adjusting makes comparisons "fairer."

TABLE 109: ANNUALIZED BLACK-ALONE, NOT HISPANIC ALL-CAUSE MORTALITY RATE, PER 100,000, 2000-2004

AREA	Average Deaths Each Year	Crude Rate	Age-Adjusted Rate
HRG 1 (3)-UC	988.8	764.5	1,135.2
Bridgeport	282.8	690.2	1,108.8
Hartford	366.4	837.0	1,139.5
New Haven	339.6	761.5	1,162.2
HRG 2 (10)-MC	519.0	620.6	973.7
HRG 3 (15)-DS	319.8	566.7	874.4
HRG 4 (27)-WS	33.6	655.5	788.8
HRG 5 (39)-MT	74.4	591.8	968.6
HRG 6 (75)-RT	40.2	474.4	876.6
Connecticut	1,975.8	668.5	1,017.1

Source: DPH Supplementary Table 9; U.S. Census 2000, SF1: Tables PCT012J. Standardized to the U.S. Population, 2000.
Note: The black crude mortality rate is much lower than the age-adjusted rate because the black population is much younger. Age adjusting makes comparisons "fairer."

TABLE 110: ANNUALIZED ASIAN-ALONE NOT HISPANIC ALL-CAUSE MORTALITY RATE PER 100,000, 2000-2004

AREA	Average Deaths Each Year	Crude Rate	Age-Adjusted Rate
HRG 1 (3)-UC	18.6	167.1	635.0
HRG 2 (10)-MC	36.4	174.4	445.1
HRG 3 (15)-DS	26.6	178.2	481.3
HRG 4 (27)-WS	17.2	138.0	361.9
HRG 5 (39)-MT	22.0	160.4	425.7
HRG 6 (75)-RT	17.4	205.9	552.4
Connecticut	138.2	169.4	463.3

Source: DPH Supplementary Table 9; U.S. Census 2000, SF1: Tables PCT012L. Standardized to the U.S. Population, 2000. City specific rates are excluded due to small denominator numbers and wide margins of error.

TABLE 111: ANNUALIZED HISPANIC ALL-CAUSE MORTALITY RATE PER 100,000, 2000-2004

AREA	Average Deaths Each Year	Crude Rate	Age-Adjusted Rate
HRG 1 (3)-UC	431.0	358.6	790.6
Bridgeport	158.2	355.7	780.5
Hartford	200.0	406.0	817.2
New Haven	72.8	275.3	765.5
HRG 2 (10)-MC	291.4	237.5	626.1
HRG 3 (15)-DS	68.0	215.3	608.6
HRG 4 (27)-WS	24.2	191.6	419.8
HRG 5 (39)-MT	53.6	251.1	617.4
HRG 6 (75)-RT	21.4	180.0	452.5
Connecticut	889.6	277.7	668.6

Source: DPH Supplementary Table 9; U.S. Census 2000, SF1: Table PCT012H. Standardized to the U.S. Population, 2000.

Data note on mortality counts and rates

An average of about 150 deaths per year are from Other Races, American Indian or Unknown and are excluded from the race-specific tables. The race-specific tables include a small number of persons of mixed race in the numerators who may be listed as black, white or Asian. U.S. Census Bureau denominator data excludes these persons, producing slightly smaller denominators and a slight elevation in crude and age-adjusted race-specific rates. In 2000, of 30,140 deaths, 1,249 or 4.1 percent were missing the Hispanic identifier. Persons for whom the Hispanic identifier was missing were assigned by DPH to non-Hispanic race specific categories in data made available for this study. The overall white non-Hispanic, black non-Hispanic and Asian non-Hispanic rates may be slightly elevated due to the assignment of "Hispanic missing" cases to these non-Hispanic groups. In the test year of 2000, the white non-Hispanic crude death rate was 984.0 per 100,000 population without the white missing Hispanic ethnicity and 1023.7 when white missing Hispanic ethnicity cases were reassigned to white non-Hispanic ethnicity. Similarly, black non-Hispanic crude rates were 649.3 and 681.4 and Asian non-Hispanic crude rates were 134.9 and 144.7 per 100,000 population.

The mortality rates produced for the *Data Scan* differ slightly from the rates available from some state and federal government sources. The federal rates are for whole states. Detailed estimates of state populations for age by sex by race and ethnicity groups are updated each year to provide denominators to calculate age-adjusted rates. In the *Data Scan*, age by sex by race and ethnicity data at the town level were required to produce mortality rates for HRGs. These required population estimates were not available for the years 2001-2004. While the numerator mortality count data were from the period 2000-2004, denominator population data from the 2000 U.S. Census only were used in the mortality rate calculations. Since the Connecticut population increased slightly from 2000-2004, the overall mortality rates reported here may be slightly higher than mortality rates reported elsewhere, because the *Data Scan* rates are based on slightly smaller denominators than those used elsewhere.

The Asian mortality rates are extremely low, consistent with those in other areas of the United States. The relative youth of this population does not account for the crude mortality differences. For example, the percentages under 35 years old for the black and Asian populations are relatively similar — 57.7 percent and 59.3 percent, respectively — yet the crude mortality rates are vastly different — 657.8 and 160.2 per 100,000 population.

The black population has a large discrepancy between crude and age-adjusted mortality. On the basis of crude rates, for example, black mortality is markedly lower than white mortality for each HRG and for Connecticut as a whole. But this occurs because of the large difference in age distribution. Taking age structure into account, the age-adjusted mortality rates for blacks are much higher than for whites as shown in Table 112.

There is also a large discrepancy between the crude and age-adjusted rates for Hispanics because the Hispanic population is much younger than the U.S. population used for age adjustment. Correcting for differences in the age distribution, the Hispanic death rate remains higher in the Urban Centers than in any of the other HRGs. It is lowest in the Wealthy Suburbs. Thus, there is a marked discrepancy among Hispanics depending on their HRG of residence.

Since residential locations differ for various Hispanic subgroups, e.g., Puerto Rican versus non-Puerto Rican Hispanics, this mortality difference may be related to Hispanic subgroup differences between HRGs. But this suggests more fundamental questions about differences in life circumstances and lifestyles *within* broad race and ethnicity categories that cannot be answered with the available data.

TABLE 112: RATIO OF RACE/ETHNICITY SPECIFIC ALL-CAUSE MORTALITY RATE TO WHITE NOT HISPANIC AGE-ADJUSTED MORTALITY RATE, 2000-2004

AREA	Asian Not Hispanic Rate to White Not Hispanic Rate	Black Not Hispanic Rate to White Not Hispanic	Hispanic Rate to White Not Hispanic
HRG 1 (3)-UC	69.6%	124.5%	86.7%
HRG 2 (10)-MC	56.4%	123.4%	79.3%
HRG 3 (15)-DS	63.7%	115.7%	80.5%
HRG 4 (27)-WS	55.0%	119.9%	63.8%
HRG 5 (39)-MT	54.2%	123.3%	78.6%
HRG 6 (75)-RT	75.4%	119.6%	61.7%

Source: Data Scan Tables 108-111. All rates are age-adjusted.

Conclusions from All-Cause Mortality Data

After the data is age-adjusted, Asian and Hispanic death rates are lower than white and black death rates (Table 112). This major finding also may be due in part to the so-called "Healthy Immigrant Effect" or, for Latinos/Hispanics, the "Latino Paradox."[194] The basic finding is that recent black and Latino/Hispanic immigrants are healthier despite having lower incomes and less health insurance. But their health worsens as they acculturate to U.S. lifestyles. Some of this affect, for Hispanics, may be due to the recently discovered "born Hispanic, died white" effect, where some Hispanics may be identified on death certificates by funeral directors as white, without information about their Hispanic status.[k] Thus, Hispanic deaths may be slightly underreported relative to their numbers in the population.

Overall, black death rates are significantly higher than white death rates after age adjustment. This pattern exists in each HRG.

Specific Causes of Mortality

Table 113 provides major cause rates for all ages; Table 114 provides them for persons dying before age 75; and Table 115 provides Years of Potential Life Lost (YPLL). Appendix K provides a complete list of deaths by cause.

TABLE 113: STATEWIDE SELECTED CAUSE OF MORTALITY BY MAJOR CAUSE, AGE-ADJUSTED RATES PER 100,000, 2000-2004

CAUSE AND ICD-10 CODE	All Groups	White-alone, Not Hispanic	Black-alone, Not Hispanic	Asian-alone, Not Hispanic	Hispanic
All Causes	763.7	750.3	1017.1	463.3	668.6
All Cancers	186.4	187.6	237.5	106.8	134.6
Lung	49.7	50.9	57.7	22.3	26.6
Colorectal	19.0	18.8	27.2	10.1	13.5
Breast*	28.3	28.6	33.7	17.0	18.6
Prostate**	20.8	20.0	47.2	2.9	20.1
Cardiovascular I00-I78	278.3	275.7	366.6	187.9	222.9
Diabetes E10-E14	18.3	16.6	46.4	11.8	29.9
HIV B20-B24	5.3	1.0	30.9	0.6	20.4
Pneumonia J12-J18	20.9	21.0	20.9	16.7	19.8
Accidental Injury Deaths	31.8	32.0	35.2	14.1	32.1
Motor Vehicle Deaths	5.0	5.3	4.6	3.2	4.5
Suicide X60-X84	8.0	8.8	4.8	2.8	6.2
Homicide X85-Y09, Y87, 1	3.2	1.3	14.1	1.5	6.0

Source: DPH Supplementary Table 9; U.S. Census 2000, SF1: Tables P12, PCT012H,I,J,L. Standardized to the U.S. Population, 2000.

**Female only, rate denominator is the female population.*

***Male only, rate denominator is the male population.*

TABLE 114: STATEWIDE SELECTED CAUSE AGE-ADJUSTED MORTALITY PER 100,000 FOR DEATHS BEFORE AGE 75, 2000-2004

CAUSE AND ICD-10 CODE	All Groups	White-alone, Not Hispanic	Black-alone, Not Hispanic	Asian-alone, Not Hispanic	Hispanic
All Causes	329.7	311.6	553.9	167.1	352.7
All Cancers	105.9	106.5	142.3	54.3	80.5
Lung	31.0	32.1	37.2	8.4	14.2
Colorectal	9.6	9.4	15.2	4.9	9.0
Breast*	18.6	18.8	24.7	12.7	12.1
Prostate**	6.1	5.7	15.5	1.3	4.3
Cardiovascular I00-I78	86.9	82.3	161.5	52.4	90.8
Diabetes E10-E14	8.6	7.4	23.0	2.7	14.3
HIV B20-B24	5.6	2.0	32.9	0.6	20.8
Pneumonia J12-J18	3.8	3.6	6.7	2.0	5.4
Accidental Injury Deaths	24.2	24.3	30.1	8.0	27.3
Motor Vehicle Deaths	4.8	5.0	4.7	2.5	4.1
Suicide X60-X84	7.9	8.8	4.8	2.9	5.7
Homicide X85-Y09, Y87, 1	3.2	1.3	14.4	1.6	6.1

Source: DPH Supplementary Table 9; U.S. Census 2000, SF1:Tables P12, PCT012H,I,J,L. Standardized to the U.S. Population, 2000.

**Female only, rate denominator is the female population.*

***Male only, rate denominator is the male population.*

TABLE 115: STATEWIDE SELECTED CAUSE MORTALITY: ANNUAL YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75, 2000-2004

CAUSE AND ICD-10 CODE	All Groups	White-alone, Not Hispanic	Black-alone, Not Hispanic	Asian-alone, Not Hispanic	Hispanic
All Causes	202,933	147,617	31,055	2,170	18,874
All Cancers	49,679	41,691	5,104	539	2,230
Lung	12,744	11,232	1,168	59	264
Colorectal	4,232	3,450	467	41	259
Breast	5,436	4,495	613	96	216
Prostate	889	734	134	1	19
Cardiovascular I00-I78	41,522	32,162	6,373	418	2,434
Diabetes E10-E14	4,027	2,844	786	16	355
HIV B20-B24	5,638	1,629	2,381	24	1,581
Pneumonia J12-J18	1,981	1,451	317	16	191
Accidental Injury Deaths	27,178	20,209	3,225	236	3,394
Motor Vehicle Deaths	5,731	4,386	540	74	711
Suicide X60-X84	8,167	6,882	529	64	639
Homicide X85-Y09, Y87, 1	4,280	1,162	2,038	50	989

Source: See Table 114.

Conclusions from the Mortality Cause Data — All Ages

As the data show, the black population has the highest age-adjusted mortality rate — except for suicide, pneumonia and motor vehicle deaths — whether one considers all mortality or mortality before age 75.

The rate ratios for blacks compared with the overall population rate are especially elevated for HIV/AIDS (30.9:5.3 = 5.8:1), homicide (14.1:3.2 = 4.1:1), diabetes (46.4:18.3 = 2.5:1), and cardiovascular disease (366.6:278.3 = 1.3:1). Their rate for suicide is lower than the overall population rate (4.8:8.0 = 0.6:1). Black males show a significantly elevated death rate before age 75 from prostate cancer (15.5:6.1 = 2.5:1).

The Asian population shows a lower rate on all indicators and on many indicators their rate is less than half the all-group rate.

The Hispanic population shows a mixed pattern. There are higher mortality rates for HIV/AIDS (20.8:5.6 = 3.7:1), homicide (6.1:3.2 = 1.9:1) and diabetes (14.3:8.6 = 1.7:1). They have lower rates for suicide (5.7:7.9 = 0.7:1).

Years of potential life lost are greatest for cancer, particularly lung cancer. The next greatest YPLL is for cardiovascular disease, and then accidental injury. These causes have relevant community-level interventions.

The complex pattern of differential causes of death for different race and ethnicity groups requires explanation. At least four explanations have been advanced:

- Differential access to and use of quality health care
- Cultural differences in behaviors that have health consequences
- Biohistorical differences that affect susceptibility to specific diseases in the modern U.S. culture
- The "healthy immigrant" theory

These competing hypotheses cannot be resolved with the information available in the *Data Scan*.

CHILD MORTALITY

The state Connecticut Department of Children and Families (DCF) reports that Connecticut has the third-lowest overall rate of child fatalities in the United States. The state was the fourth lowest in the nation in 2002 fatalities due to accident, suicide, or homicide in youth ages 15-19, at a rate of 34 per 100,000.[195] The 2002 report was DCF's last comprehensive annual report on child fatalities. According to the National Center for Health Statistics, the 2000 mortality rate for children 0-19 years old in Connecticut was 52.2 deaths per 100,000 population. The infant mortality rate (ages 0 to 1 year) was 6.6 per 1,000 live births.[196] The state Department of Public Health reports that the leading cause of death among children ages 1 to 19 in 2003 was unintentional injury, and among these motor vehicle incidents were the greatest number. Table 116 provides the leading causes of child mortality.

TABLE 116: 10 LEADING CAUSES OF DEATH IN CHILDREN (AGES 0-19) IN CONNECTICUT, 2003

AGE GROUP	Cause	Count
< 1	Short Gestation and Low Birth Weight Congenital Anomalies	40 34
1 - 4	Accidents (unintentional injury) Motor Vehicle Heart Disease	9 4 3
5 - 9	Accidents (unintentional injury) Motor Vehicle Malignant Neoplasms	6 5 4
10 - 14	Malignant Neoplasms Accidents (unintentional injury) Motor Vehicle	8 7 2
15 - 19	Accidents (unintentional injury) Motor Vehicle Poisoning Homicide By Firearm	48 29 11 11 8

Source: DPH Connecticut Resident Deaths, 2003: Top Five Leading Causes of Death by Age and Sex. Available at: http://www.dph.state.ct.us/OPPE/RR2003/RR2003_T10.xls. Accessed Feb. 3, 2007.

In cases of child mortality in which abuse may have been a possible cause of death, DCF conducts an investigation independent of medical examiner findings. DCF also notes that some deaths are ruled as homicides by the police, although medical and judicial findings may differ. According to DCF, 3 percent of child deaths reported in 2002 were the result of abuse — including skull fractures, intentional suffocation, and shaken baby syndrome.[197]

EMERGENCY DEPARTMENT UTILIZATION (ED)

Several types of emergency department (ED) utilization fall within the general heading of health outcomes. Two of these are assaults and suicide attempts. The data for these two indicators show very different patterns, by HRG.

TABLE 117: EMERGENCY DEPARTMENT UTILIZATION PER 100,000, 2002-2003

AREA	Assaults	Suicide Attempts
HRG 1 (3)-UC	10.1	1.8
HRG 2 (10)-MC	5.6	1.5
HRG 3 (15)-DS	3.9	1.6
HRG 4 (27)-WS	1.3	0.9
HRG 5 (39)-MT	2.7	1.5
HRG 6 (75)-RT	2.0	1.3
Connecticut	3.9	1.3

Source: Connecticut Health Information Management and Exchange (CHIME) Database, Connecticut Hospital Association (CHA).

The HRG rates for ED visits for assaults shown in Table 117 follow a familiar pattern from highest to lowest: Urban Centers > Manufacturing Centers > Diverse Suburbs > Mill Towns > Rural Towns > Wealthy Suburbs. Suicide shows a less clear pattern, except that the Urban Centers have twice the rate of suicide-related ED visits as the Wealthy Suburbs (1.8:0.9 = 2:1). The assault rate ratio between the Urban Centers and the Wealthy Suburbs is 10.1:1.3 = 7.8:1, a rate ratio for assault-related visits that is more than triple that of suicide-related visits.

These data do not suggest a clear reason for this difference in pattern for violent impulses turned outward (assault) versus inward (suicide), but the topic is worth further investigation.

CANCER INCIDENCE

Cancer incidence is reportable to the Connecticut Tumor Registry, within DPH. Cancer incidence data for this study have been aggregated into HRGs and reported by race and ethnicity. The cancer incidence rate data may, therefore, be analyzed by HRG to develop hypotheses about potential environmental and lifestyle risk factors and then design interventions.

TABLE 118: AVERAGE ANNUAL AGE-ADJUSTED CANCER INCIDENCE RATES PER 100,000 FOR CONNECTICUT, 1998-2002

RACE AND ETHNICITY	HRG 1 (UC)	HRG 2 (MC)	HRG 3 (DS)	HRG 4 (WS)	HRG 5 (MT)	HRG 6 (RT)	State
Colorectal Cancer							
White-alone, Not Hispanic	70	65	65	57	64	61	63
Black-alone, Not Hispanic	64	59	53	38L	72	58	60
Hispanic	38L	43	37L	37L	80	74	44
All race/ethnicity	61	61	63	57	63	61	61
Lung Cancer							
White-alone, Not Hispanic	91	77	79	56	77	64	72
Black-alone, Not Hispanic	75	68	63	55	60	80	70
Hispanic	38L	33L	38L	54	52	61	39L
All race/ethnicity	72	69	74	55	75	63	68
Prostate Cancer (Male)							
White-alone, Not Hispanic	162	150	155	193	148	161	160
Black-alone, Not Hispanic	216H	218H	243H	364H	219H	191	224H
Hispanic	102L	113L	117L	277H	177	138	122L
All race/ethnicity	155	148	159	197	150	162	161
Breast Cancer (Female)							
White-alone, Not Hispanic	161	162	166	190	161	174	169
Black-alone, Not Hispanic	122L	115L	131	206H	140	131L	124L
Hispanic	73L	77L	115L	120L	120L	181	87L
All race/ethnicity	118	140	157	188	158	172	157

Source: Counts of cancers were obtained from the Connecticut Tumor Registry (CTR), DPH; Rates were calculated by the author using cancer counts as numerators and U.S. Census 2000, SF1:Tables PCT12, PCT12H,I,J as denominators.

Notes: (1) Invasive cancers only are included in the table. (2) Since Connecticut populations of interest have very different age distributions, all incidence rates are age-adjusted. Cancer incidence counts for three broad age categories (60; 60-79; 80+ years) were available from the CTR without the need to seek approval from the DPH Human Investigations Committee. Therefore, the age-adjusted rates reported here are slightly different than those computed using five-year age groups. (3) According to the CTR, some errors in coding of "Hispanic" occur because hospitals do not ascertain Hispanic ethnicity for all cancer patients. The CTR, along with many other U.S. cancer registries performs Spanish-surname matching in an attempt to improve identification of patients who might identify themselves as Hispanic/Latino. These results were included in the numerator data used in the table. (4) Race and ethnicity specific rates significantly below the total rate for the state are labeled "L" and those significantly above the state rate are labeled "H." (5) Certain data used in this study were obtained from the CTR, located in DPH. The author assumes full responsibility for analyses and interpretation of these data.

The most significant findings in Table 118 are that black males are significantly high in prostate cancer incidence in every HRG but the Rural Towns, where the difference is not large enough to be statistically significant given the small underlying population. Blacks have a lower rate for colorectal cancer in the Wealthy suburbs; and a lower rate for breast cancer in the Urban and Manufacturing centers and Mill Towns.

Hispanics are below the overall Connecticut rates on several cancer indices, including: colorectal cancer in the Urban Centers and Diverse and Wealthy suburbs; lung cancer in the Urban and Manufacturing centers and Diverse Suburbs; and breast cancer in all but the Rural Towns.

Some of the differences for Hispanics are possibly due to difficulties in age adjustment. The age categories used for the data provided for this study by the Tumor Registry were "under 60," "60-79," and "80 and over." These broad categories were used so as to preserve confidentiality. Since the Hispanic population is very young, these age categories may not have yielded a sensitive enough age adjustment. Another factor producing lower Hispanic rates may be the potential undercounts suggested in the Table 118 notes.

Some persons may be included in the rate numerators (e.g., multiracial black non-Hispanic residents) but excluded from rate denominators (black-alone non-Hispanic residents). Therefore, the rates reported here, as all rates, should be treated as estimates only, with some potential for bias.

Asian cancer incidence rates are not available due to small counts and preservation of confidentiality.

CHAPTER 10

Connecticut Data Infrastructure Issues

CHAPTER 10

CONNECTICUT DATA INFRASTRUCTURE ISSUES

INTRODUCTION

In the course of investigating many datasets for this *Data Scan*, strengths and opportunities for improvement were noted and are described in the observations to follow.

One of the strengths in the Connecticut state agencies is the existence of a core of well-trained and competent analytic staff. Publications and presentations attest to this strength. Without their cooperation much of this *Data Scan* could not have been written. Thus, the conclusions about the state of community health data represent a judgment about the lack of a well-supported *system*, rather than about these key analytic staff.

SIGNIFICANT DATA REPORTING ISSUES

- There are problems with data access and coordination "infrastructure" in Connecticut that were studied in the Cornerstone Report.[198] For example, there is no query-driven system allowing easy access to data for the public such as exist in Massachusetts (Mass-CHIP), Utah (IBIS-PH), South Carolina (SCANDHEC), and Missouri (MICA).[l, m]

- Requests for anything other than standard web-based reports must be fulfilled separately by Connecticut state agency personnel. A query-driven system would simplify analysis of health disparities, for example, and make the data more easily available, leading to a more engaged and informed citizenry and possibly reduce staff time spent in producing individual reports.

- The Cornerstone analysis of the state of community health data in Connecticut listed a number of structural weaknesses, resulting in delayed release of the data — such as the 2003 posting of only preliminary vital statistics from 1999, a "symptom of serious resource and infrastructure problems." New data responsibilities, such as monitoring of health services quality, have been added to the Connecticut Department of Public Health (DPH) responsibilities through legislation but without additional resources.[199]

- Public agencies are frequently said to be "behind" in their reporting of data. This may true to some extent, and these delays may indicate "systems problems." For example, as of August 2005, Connecticut mortality data were available on the DPH web site only through 2002. As of November 2006, data for 2003 were similarly available on the public web site, and 2004 data were available upon special request. In comparison, query-based web sites contained mortality data for South Carolina (2004), Utah (2005), Missouri, (2005) and Massachusetts (2004) as of November 2006. A systematic understanding of the process of collecting such data, necessary quality checks on it, and assembly for analysis and dissemination to the public would suggest why this delay might occur and plan process improvements.

- As of December 2006, no population estimates or population projections existed beyond the U.S. Census 2000, specific to race/ethnicity and age for Connecticut cities and towns. These are expected in 2007.[200] State data collectors and analysts have voiced concerns with reporting city- and town-level health rates based on population counts that may have changed, and whose age or race/ethnicity composition has shifted in the mid-Census years.[n]

- No easy-to-access and up-to-date mapping capability exists in the Connecticut health data "system." Again, the comparison with Mass-CHIP and some other state data query systems is instructive. In Mass-CHIP, and in other state data query systems, data can be graphed and mapped, allowing for great flexibility in analysis and presentation.

- Certain issues can be studied only in the context of parallel geo-coded datasets. For example, to test the hypothesized connections between race, ethnicity, asthma, and waste disposal sites, one would need to obtain and geocode the home addresses of asthma patients and in parallel geocode waste disposal sites. This is theoretically possible, given that home addresses of patients are taken upon admission to the emergency department (ED) or hospital.[q] There is apparently insufficient infrastructure to regularly geocode and analyze health data. There are also confidentiality issues to be addressed in studies of this kind.

- Web-based health data are typically, but not always, available in portable document format (PDF) or Microsoft Word files. Although PDF files have certain advantages — such as being downloaded and printed on a variety of platforms — they cannot be manipulated for analytic purposes without conversion of the data into other database formats such as Microsoft Access or Excel. A variety of download options should be made available.

- Despite the widely recognized importance of youth out-of-school program participation, there is no comprehensive dataset on this key indicator. Nor is there any way to systematically estimate it. A survey report of elementary- and middle-school parents and school administrators, conducted for the Connecticut Office of Planning and Management (reported in 2002), did not ask for the frequency or percentage of participation, and promised the school administrators responding that school district-specific data would not be reported. One method used in Massachusetts is to add items onto the Massachusetts equivalent of the Connecticut Academic Performance Test (CAPT), asking each child about their type and frequency of out-of-school program participation. This data can be used to estimate town-wide participation in out-of-school activities as well as race and ethnicity disparities in participation.

- While data are plentiful on car crashes involving injury, such data are produced for the location of the crash, not by driver characteristics such as residence location and age. It would be useful to create access to these latter indicators. Studies could better inform policy recommendations regarding graduated licenses by age or community-level interventions.

- Access to mental health data is problematic. Mental health data are of uneven quality and lack documentation that would assist in access and understanding.

- There are a variety of datasets for health care quality — including Hospital Compare, Nursing Home Compare and Home Health Compare — and for adverse event reporting and malpractice lawsuits. A Connecticut Health Care Quality Index could include subindicators that can be updated regularly to show whether or not health care quality is improving, which areas are lagging and which are leading. This is a long-term project since the capability of health systems to deliver timely data, agreements on what constitutes "quality" and the numbers of indicators available are currently inadequate to support such an effort.

- There is no agreed-upon method to "index" health disparities in a way that would suggest overall progress or lack of progress. This will be a difficult index to construct, but worth the effort since it will summarize overall trend data, as well as identify "lagging" and "leading" indicators within the index. A science-based dialogue about such an index would in and of itself be a step forward.

- There is no continually updated logically coherent list of available datasets for all relevant Connecticut state agencies. Each researcher or activist attempting to locate data must start at the beginning with calls to state agency personnel. A one-time expense to set up such a database of datasets, and a requirement that state agencies update the list as new data are added, would provide a valuable resource. DPH produced such a list in 2003, but it does not appear to have been updated since that time.

- The agency web sites are not well organized to provide easy access to data by subject matter. The alphabetical ordering of data, reports and forms is not "user friendly." Several "data rich" agencies have virtually none on their web sites.

- There is a serious lack of "meta-data," documentation about the data themselves, on the datasets accessed. For example, one report cites data by "urban" and "suburban" areas but does not define these terms. Another example is the complete lack of readily available information about data quality-control procedures. Meta-data are easy to include when datasets are created, but typically difficult to reconstruct at a later point in time. A standard for meta-data could be established with the clear expectation that state agency reports will follow the standard.

CHAPTER 11

Summary and Recommendations

CHAPTER 11

SUMMARY AND RECOMMENDATIONS

Six focus areas are suggested to improve the health of the people of Connecticut by: increasing access to high quality care; promoting disease prevention, wellness, and active management of chronic health problems; and securing improvement of health outcomes and wise use of resources. Additional factors considered in selecting these areas were that they: show a significant amount of racial/ethnic disparity; involve risk factors that are likely to produce significant future health problems; or be health risks and conditions that are elevated above the *Healthy People 2010* national targets.

The focus areas are:

- Health Reference Groups (HRGs), and race and ethnicity groups in greatest need
- Diabetes and other conditions in the metabolic syndrome
- The medical home
- The binge drinking and smoking culture
- Youth risks and opportunities
- The health data system

The following sections explore each of these focus areas in detail.

FOCUS AREA 1 — FOCUS ON THE HEALTH REFERENCE GROUPS (HRGs) AND RACE AND ETHNICITY GROUPS IN GREATEST NEED

Many methods could be used in setting priorities and determining focus areas for future effort. These are discussed in Appendix L.

Findings and Analysis

Most of the data in the *Data Scan* are organized according to the HRGs previously described. On almost all measures of health risk and outcome, the ordering of HRGs is, from most to least risk and from poorest to best health outcomes: Urban Centers > Manufacturing Centers > Diverse Suburbs > Mill Towns > Rural Towns > Wealthy Suburbs.

The rates for black residents show significantly greater risk or poorer outcomes on more indicators than other race/ethnicity groups, even after controlling for HRG of residence. The rates for Asian residents, where available, show the lowest rates of risk and the best outcomes. Rates for Hispanic residents are mixed. On some indicators they show higher health risks and poorer health outcomes than other groups, but on other indicators they show better outcomes, if not better risk status. This pattern may be due to significant variation within the Hispanic ethnicity group, particularly between Puerto Rican and non-Puerto Rican Hispanics.

Quantitative Data on Health: Selected Measures

The full *Data Scan* includes more than 170 tables and figures showing health and related indicators for individual cities and towns, HRGs and Connecticut as a whole. Table 119 illustrates the rates for a selection of these measures, which were used to estimate needs in each of the HRGs. The indicators were selected to represent a wide variety of aspects of health. This was done so that no one area would be overrepresented in the needs analysis.

The rates shown in Table 119 follow a pattern similar to self-reported overall poor health: Urban Centers > Manufacturing Centers > Diverse Suburbs > Mill Towns > Rural Towns > Wealthy Suburbs.

TABLE 119: SELECTED INDICATORS OF HEALTH, BY HEALTH REFERENCE GROUP

INDICATOR	Connecticut	3 Urban Centers	10 Manufacturing Centers	15 Diverse Suburbs	27 Wealthy Suburbs	39 Mill Towns	75 Rural Towns
Population, 2000	3,405,565	384,733	662,398	587,504	487,620	698,517	584,793
Accepted Child Abuse Cases per 1,000, 2001-2005	36.8	68.2	53.2	43.8	9.8	32.0	19.8
Crimes Reported per 1,000, 2002-2003	30.0	76.1	39.5	29.5	13.0	22.7	12.1
Car Crashes with Injury per 1,000, 2002	9.4	15.8	10.7	8.5	7.8	8.3	7.2
STD Rate per 1,000, 2000-2004	5.8	21.5	7.6	4.6	0.8	1.7	1.1
Teen Births 15-19 per 1,000, 1999-2003	24.0	57.3	39.9	22.2	2.9	13.0	7.3
Percentage Self-Reported Employment Related Disability for Persons 21-64, 2000	11.3	17.7	14.4	12.5	6.4	10.0	8.4
Percentage Obese: Calculated from Self-Reported Height and Weight, 18 and Older, 1999-2003	17.2	23.5	18.2	19.2	11.0	18.0	15.1
Emergency Department (ED) Visits per 1,000, 2002-2003	387.4	607.6	498.3	404.6	214.6	343.6	295.9
Deaths Before Age 75 per 100,000, 2000-2002	350.3	444.0	381.1	366.4	244.2	372.3	300.0

Source: See "Data Scan" text tables.

There is a large difference in the size of the differentials for the various indicators. For example, the rate ratio of sexually transmitted disease (STD) case rates for the Urban Centers to the Wealthy Suburbs is 21.5:0.8 = 26.9:1. The rate ratio between Urban Centers and Wealthy Suburbs for overall mortality before age 75 is only 444.0:244.2 = 1.8:1. Thus, HRG of residence makes a much greater difference for STD rates than for mortality rates. The differences cannot be accounted for by age distribution differences between the HRGs.

Community Need Calculations

One approach to estimating comparative need in each of the HRGs is to estimate the percentage of the total need in the state attributable to each HRG.

Table 120 converts the rates from Table 119 into percentages for each HRG, based on relevant population size, and then summarizes the need in each HRG by averaging all of the selected indicators.

A summary of the results in Table 120 indicates that half (49.1 percent) of the total need in the state is attributable to the 13 communities in the Urban and Manufacturing centers, compared with their 31.8 percent of the total population for the state. Conversely, 50.9 percent of the need exists in the remaining 156 communities with 68.2 percent of the total population.

Recommendations

Resources could be allocated among HRGs, approximating the percentage distribution of need, over the broad set of indicators: 24.0 percent to the three Urban Centers; 25.1 percent to the 10 Manufacturing Centers; 17.3 percent to the 15 Diverse Suburbs; 6.8 percent to the 27 Wealthy Suburbs; 16.4 percent to the 39 Mill Towns; and 10.4 percent to the 75 Rural Towns, as shown in Figure 28.

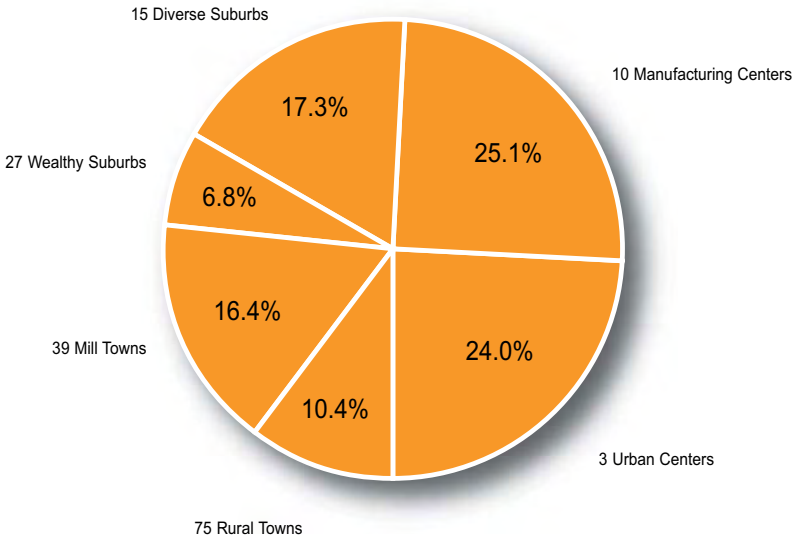
TABLE 120: PERCENTAGES OF TOTAL CONNECTICUT ESTIMATED NEED, FOR SELECTED INDICATORS, BY HEALTH REFERENCE GROUP

INDICATOR	3 Urban Centers	10 Manufacturing Centers	15 Diverse Suburbs	27 Wealthy Suburbs	39 Mill Towns	75 Rural Towns
Accepted Child Abuse Cases	23.7	26.9	19.1	4.2	16.5	9.6
Crimes	28.7	25.6	17.0	6.2	15.5	6.9
Car Crashes with Injury	19.0	22.2	15.6	12.0	18.1	13.2
Sexually Transmitted Disease/Known Residence	45.5	27.6	14.8	2.2	6.4	3.5
Teen Births 15-19	35.5	31.6	15.5	1.6	10.9	4.9
Self-Reported Employment Related Disability for Persons 21-64	16.9	25.2	18.4	8.0	18.6	12.9
Obesity: Calculated Self-Reported Height and Weight, 18 and Older	14.6	20.7	19.5	8.7	21.8	14.7
ED Visits	17.7	25.0	18.0	7.9	18.2	13.1
Average Deaths < 75	14.6	21.1	17.8	10.0	21.6	14.9
Average, All Measures	24.0	25.1	17.3	6.8	16.4	10.4
Population (Percentage)	11.3	19.5	17.3	14.3	20.5	17.2

Source: See "Data Scan" text tables.

Somewhat greater weight beyond the crude percentages could be given to health risks in the Urban and Manufacturing centers since their populations are generally younger, and these risks represent significant future problems. Key populations at risk are the black and Puerto Rican Hispanic residents in the three Urban Centers and in the 10 Manufacturing Centers, as they have the largest health risks beyond those that would be predicted based on their HRG residence alone. The concentration of black and Hispanic residents in these areas is discussed in Chapter 3, Connecticut Community Profile, and in Appendix C.

FIGURE 28: PERCENTAGE DISTRIBUTION OF ESTIMATED NEED BY HRG



FOCUS AREA 2 — FOCUS ON DIABETES AND OTHER CONDITIONS IN THE METABOLIC SYNDROME

Findings and Analysis

Type 2 diabetes may lead to serious complications, including heart disease, blindness, nerve damage, and kidney damage.[201] There are clear racial and ethnicity disparities in risk factors, incidence, hospitalization, and mortality due to diabetes.

Diabetes Incidence

Age-adjusted rates of Connecticut residents "ever told they have diabetes" are 4.7 percent for the white population age 18 and over, 8.8 percent for the black population, 7.5 percent for the Hispanic population, and 5.3 percent for the Asian population.

In contrast, the *Healthy People 2010* objective is for no more than 2.5 percent of the adult population with a diagnosis of diabetes.[202] Thus, diabetes is a problem for all racial and ethnic groups, but it is particularly for black and Hispanic residents.

Diabetes Mortality Disparities

The age-adjusted diabetes mortality rate before age 75 for Connecticut overall (2000-2004) is 8.6 per 100,000. For whites, the age-adjusted rate is 7.4 per 100,000 residents, while it is 23.0 per 100,000 for black residents, 14.3 for Hispanics, and 2.7 for Asians. Thus, blacks have almost triple the "premature" diabetes mortality of whites.

Diabetes is not only a prevalent condition, but it is also a good "index" for examining chronic disease disparities, since there are data at each level in the causal chain. Diabetes can also be understood as part of a larger concept of the "metabolic syndrome" — a group of related conditions including diabetes, heart disease and stroke.

Diabetes and Ambulatory Care Sensitive Conditions

Diabetes and metabolic syndrome care are particularly important markers for understanding health disparities.

Of the 16 conditions tracked by the Office of Healthcare Access (OHCA), the hospitalization ratio of rates for blacks to rates for all races is highest for hypertension (rate ratio of 89.1:24.7 = 3.6:1); next highest for uncontrolled diabetes (rate ratio of 26.1:7.4 = 3.5:1); followed by diabetes short-term complications (rate ratio of 143.5:42.5 = 3.4:1); and diabetes long-term complications (rate ratio of 263.2:105.8 = 2.5:1). One additional condition potentially related to diabetes, lower extremity amputation, ranks seventh in this rate-ratio comparison at 83.2:38.0 = 2.2:1.

Ambulatory care sensitive conditions (ACSCs) are conditions for which hospitalization could be avoided through appropriate ambulatory care. ACSC conditions are good markers for how well the health care system provides, and residents utilize preventive services and care in appropriate settings. The ACSCs are discussed more broadly in the section of this chapter on the "Medical Home," as well as in Chapter 7: Health Care Quality.

The high rate ratios for these metabolic syndromes and ACSC conditions for the black population, even utilizing crude rates that underestimate the age-adjusted rates, are cause for serious concern about this health disparity.

Risk Factors: Obesity and Lack of Physical Exercise

Obesity and lack of physical exercise are key modifiable risk factors for diabetes and metabolic syndrome diseases. There has been a significant increase in obesity in the past decade, both nationally and in Connecticut. There are also significant disparities that could worsen if they are not addressed. The black population is especially at risk.

Behavioral Risk Factor Surveillance System (BRFSS) data for Connecticut demonstrate that 15.9 percent of the age-adjusted 18 and over white population is considered obese under national guidelines; 30.9 percent of the black population; 21.6 percent of the Hispanic population; and 4.2 percent of the Asian population. Within the black population females are more likely obese than males in all age groups 30 and over.

High blood pressure is another aspect of metabolic syndrome. According to self-report, this condition affects 28.0 percent of the white population 18 and over; 37.1 percent of the black population; 27.2 percent of the Hispanic population; and 26.5 percent of the Asian population.

Self-reported rates of "no physical activity" are 20.3 percent of the white population; 34.9 percent of the black population; 40.6 percent of the Hispanic population; and 28.3 percent of the Asian population.

These rates suggest a looming future problem of metabolic syndrome diseases among all populations, but particularly among blacks and Hispanics.

Obesity: The Special Case of Immigrants

Although immigrants are less obese than native-born residents of the United States, this comparative advantage disappears the longer they are in the country. In one survey, immigrant respondents "were less likely to be overweight or obese" than the U.S.-born respondents (16 percent vs. 22 percent). Eight percent of those who had lived in the United States for less than one year were obese. But 19 percent of those who had lived in the country for at least 15 years were obese. This relationship between body mass index (BMI) and years of residence held true for all racial/ethnicity groups except foreign-born blacks.[203]

This research has led to several studies aimed at finding the roots of the apparent tendency for immigrants to adopt less healthy lifestyles the longer they reside — and presumably the more they acculturate — in the United States. Women in one focus group study suggested that limited time for family, cooking, and food shopping, as well as such obstacles as lack of transportation and child care, influenced the diets of long-term immigrant residents — rather than scarcity of food or physical access to grocery stores.[204]

Metabolic Syndrome Disparities Develop Early

The Youth Risk Behavior Survey (YRBS) at the state and national levels, as well as the National Health and Nutrition Surveys (NHANES), contain data on key indicators for youth adopting lifestyles that may lead to metabolic syndrome conditions later in life. Both surveys show that high school students are at increasing risk due to increased rates of overweight and decreased rates of physical activity.

The risks are especially acute among black and Hispanic teens.[205] According to the Connecticut School Health Survey (available at: http://www.dph.state.ct.us/PB/HISR/CSHS.htm), 9.2 percent of white high schoolers in Connecticut were overweight (at or above the 95th percentile for body mass index) in 2005. By comparison, 15.4 percent of black and 17.9 percent of Hispanic high schoolers were overweight. The difference between white and Hispanic students is statistically significant.

The survey also found that white students (67.2 percent) were more likely to have engaged in vigorous physical activity than black (53.6 percent) or Hispanic (52.1 percent) students. The white-Hispanic differences are statistically significant.

These differences were consistent with the rates of those who "watch TV three or more hours per day." The self-reported percentages were significantly lower for white students (27.9 percent) than for black students (59.1 percent), and Hispanic students (42.6 percent).

The race/ethnicity differences for Connecticut are consistent with data from national surveys and similar states (e.g., Massachusetts and Rhode Island). Further detailed data are available in Chapter 4, Health Risk and Health-Promoting Behaviors.

Prevention Is the Key

The Mayo Clinic's "Tools for Healthier Living" suggest that the primary goal for metabolic syndrome is to *prevent* the development of type 2 diabetes, heart attack and stroke. This can usually be accomplished with an aggressive regimen of self-care strategies focusing on diet and exercise.

Mayo recommends: eating a healthy diet with fruits, vegetables, beans and other fiber foods, white meat or fish; avoiding processed or deep fried dinners, eliminating table salt; participating in at least 30 minutes of moderately strenuous activity most days of the week; undergoing regular screenings for blood pressure; and stopping smoking.[206]

The Connecticut Medicaid Managed Care Council's Quality Assurance Subcommittee has developed recommendations regarding childhood obesity. Rather than the traditional view that obesity reflects a lack of discipline in choosing an appropriate diet and adequate physical activity, this "ecological model" assumes a complex interaction of individual physiology, family, social environment in communities, cultural influences, and larger social influences on the development of obesity. Interventions based on this model emphasize systematic changes of the factors that promote obesity, including the influence of family, community, and social circumstances (worksite, school, and health care), cultural factors, and the larger social policy environment.[207]

Recommendations

Diabetes and its complications are a significant problem for the black/African American population in Connecticut and nationwide. The causal factors for diabetes, such as obesity, are becoming more prevalent in all age groups and in the whole population. This is a "ticking time bomb" for the current and future adult population.

Addressing metabolic syndrome and its causes will require significant additional prevention-focused support for organizations, that serve youth and adults, such as better primary care access, utilization and focus on the key metabolic syndrome issues in the primary care encounter.

It will also require further public policy development regarding diets available, opportunities for exercise and information about both. These efforts could be focused especially to benefit the black population, which suffers the most from metabolic syndrome diseases and premature death from them.

FOCUS AREA 3 — THE "MEDICAL HOME" CONCEPT: AVOIDABLE EMERGENCY DEPARTMENT (ED) AND HOSPITAL UTILIZATION AND UNDER-USE OF PRIMARY CARE

Findings and Analysis

Health services researchers and policy-makers increasingly realize the importance of a "medical home" — where people can regularly obtain care. Unfortunately for many people, this medical home is often a costly and inappropriate one — the hospital emergency department (ED).

This section examines the self-report data on having a regular source of care, hospitalization for ACSCs, emergency department utilization, linguistic isolation, and preventive care and screening.

Age-adjusted BRFSS survey data for Connecticut reveals that Urban Center adult residents (age 18 and over) are least likely to report a regular source of medical care: only 74.7 percent report such a "medical home." This compares with 80.9 percent in the Manufacturing Centers and values above 87 percent in all of the other HRGs.

These differences are partly due to the low rates for Hispanic residents (66.8 percent in the Urban Centers and 67.2 percent in the Manufacturing Centers) and black residents (77.9 percent in the Urban Centers and 75.4 percent in the Manufacturing Centers). Statewide, white residents are more likely to report having a regular source of medical care (87.5 percent age-adjusted), compared with black and Asian residents (80.7 percent and 79.6 percent, respectively) and Hispanic residents (only 69.7 percent).

These rates to some extent parallel the results for the BRFSS item on who has health insurance: 91 percent of white residents (age-adjusted rate for residents over 18) and 88.5 percent of Asian residents versus 81.6 percent of black residents and 70.9 percent of Hispanic residents. As Table 121 demonstrates, white, black and Hispanic residents having medical homes parallel their having medical insurance, but Asian respondents have a significantly higher rate of health insurance than they have a regular source of care.

TABLE 121: PERCENTAGES OF CONNECTICUT RESIDENTS 18 AND OVER CLAIMING A REGULAR SOURCE OF CARE AND HEALTH INSURANCE, BRFSS SURVEY, 1999-2003

RACE/ETHNICITY GROUP	Percentage with a Medical Home	Percentage with Health Insurance
White, Not Hispanic	87.5	91.0
Black, Not Hispanic	80.7	81.6
Hispanic	69.7	70.9
Asian, Not Hispanic	79.6	88.5

Source: DPH; BRFSS 1999-2003. Note: All race and ethnicity specific rates are age-adjusted.

Hospitalization for Ambulatory Care Sensitive Conditions

OHCA has identified several ambulatory care sensitive conditions for which hospitalization can be avoided through adequate primary care. A high rate of ACSCs is an indicator that disease is not being handled well or at all in the primary care setting, the medical home. This situation could occur for several reasons:

- Patients have inadequate access to primary care or do not use primary care, even when available, until late in the disease process, and then require emergency care and/or hospitalization;
- Poor communication between providers and patients;
- Patients use primary care, but do not follow prescribed medication;
- Inadequate follow-up systems; or
- The underlying condition may be frequent in the population, and even with equal access to and utilization of primary care, the ACSC rate might still be higher (e.g., rates of diabetes for blacks).

Thus, ACSC rates are a "flag" for further investigation, not a conclusion about principal causes. Table 92 in Chapter 7, Health Care Quality, indicates that ACSC rates are highest in the Urban Centers, followed by the Manufacturing Centers, Diverse Suburbs, Mill Towns, Rural Towns, and Wealthy Suburbs, in that order.

ACSC rates are highest for blacks — double the rate for whites — followed by Hispanics and then by whites.

Emergency Department (ED) Utilization

Variation in the rates of ED use can be an indicator of problems with access to primary care or lack of utilization of primary care or poor continuity of care. Although the ED's primary role is immediate treatment and/or stabilization of seriously ill and injured patients, the ED is often used for unscheduled care because of inadequate capacity or underutilization in other parts of the health care system. A study was conducted for the *Data Scan*, based on hospital ED record data from the Connecticut Health Information Management and Exchange (CHIME) database for fiscal years 2002 and 2003 combined. Chapter 7, Health Care Quality, discusses this study — results reproduced in Table 122 — suggesting that Connecticut's urban area populations are most likely to use the hospital ED for treatment of conditions that can be treated more appropriately in a practitioner's office or clinic.

TABLE 122: ANNUALIZED AGE- AND SEX-ADJUSTED EMERGENCY DEPARTMENT VISITS PER 1,000 BY HRG AND RACE/ETHNICITY, FISCAL YEARS 2002-2003

AREA	All	White	Black	Hispanic	Asian
HRG 1 (3)-UC	608.1	423.9	745.4	743.3	117.8
HRG 2 (10)-MC	492.7	394.3	720.8	724.1	76.8
HRG 3 (15)-DS	398.3	379.1	564.3	498.7	126.7
HRG 4 (27)-WS	222.0	217.3	392.4	264.0	95.1
HRG 5 (39)-MT	341.2	340.9	554.6	319.1	99.3
HRG 6 (75)-RT	306.6	308.0	412.0	203.4	114.8
Connecticut	388.0	329.4	674.1	640.5	100.0

Detailed data and sources are included in Chapter 7, Health Care Quality, and online at www.cthealth.org.

Summary of ACSC and ED Visit Data

There is a significant problem of hospitalization for ACSC and ED utilization for conditions that could be seen in other less expensive, usually more effective settings. This problem is particularly prevalent in the more urbanized settings, and among black and Hispanic residents within these settings, and may be due partly to differential rates of health insurance coverage. However, the differences in insurance rates do not account for the extreme differences in ED utilization. Therefore, fully understanding disparities in the existence or utilization of the medical home is a task still to be accomplished.

Linguistic Isolation

The areas of high ED utilization overlap somewhat with areas of household "linguistic isolation." Among all households, 7.8 percent in the Urban Centers and 4.2 percent in the Manufacturing Centers are Spanish-language linguistically isolated. For all other HRGs, Spanish-language linguistic isolation is negligible. Among households in the Urban Centers, 3.3 percent are linguistically isolated for "other Indo-European language"; among households in Manufacturing Centers, 3.4 percent. In general, Asian-language linguistic isolation is negligible.

The Hispanic population is of particular concern because of higher rates without health insurance, lower rates with a regular source of medical care, and significantly higher rates of linguistic isolation.

Prevention and Screening

Rate disparities are mixed for preventive care and screening, suggesting that although such care is received, it may be in settings other than a "private" medical home. For example, despite differences in health insurance, the BRFSS survey shows negligible differences in self-reported mammogram rates "in the past two years": 74.7 percent for white women over 40, 76.2 percent for black women and 72.3 percent for Hispanic women; the rate for Asian women is not available. Age-adjusted Pap smear rates are 88.5 percent for white women, 85.6 percent for black women, 80.1 percent for Hispanic women, and 76.9 percent for Asian women. Health programs such as the Connecticut State Breast and Cervical Cancer Early Detection program may act to reduce disparities. Chapter 6, Screening and Prevention, includes detailed data for additional screening tests.

What Is the Value of a Medical Home?

A primary care "medical home" is a place where prevention, screening and guidance regarding causes of metabolic syndrome diseases, problems of alcohol use and abuse, child and youth safety, and other health-related issues can be addressed. Follow-up testing and care can be managed through discussion between practitioners, patients and their families.

But there are cultural and systems constraints to developing a medical home, where time can be taken for these discussions and true patient-provider continuity established. For example, practitioners and patients may have very limited time for dialogue. Language barriers may impede communication. Finally, the meaning of the term "medical home" may be problematic for some immigrants who travel frequently to their "home" countries and who may have multiple medical homes.

Recommendations

Unnecessary ED and hospital utilization are both stressors for the health care system and may result in less effective care. Policies could focus on encouraging greater and earlier use of primary care.

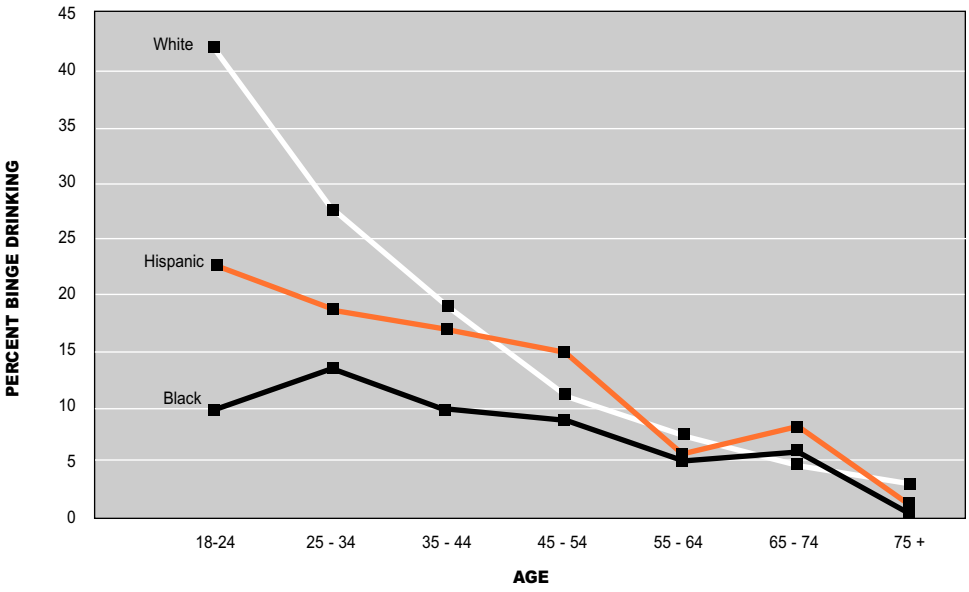
A whole systems approach will be required to reduce avoidable ED and hospital utilization, especially in the Urban and Manufacturing centers. Such an approach would focus on increasing access and comfort with the language and cultural surroundings of the medical home; utilizing the medical home to discuss issues of health risk, chronic disease, and issues of child and youth safety; and promoting adherence to medical regimens prescribed in the primary care setting. In short, a systems approach will need to support and enhance the role of community health centers.

FOCUS AREA 4 — FOCUS ON THE BINGE DRINKING AND SMOKING CULTURE

Findings

Data from the BRFSS surveys demonstrate significant age, race/ethnicity and educational level differences for smoking; considerable race/ethnicity differences were also noted for youth and youth adult binge drinking. These differences are particularly pronounced for the population ages 18-24. Reproduced below is a key figure from Chapter 4, Health Risk and Health-Promoting Behaviors, to illustrate the patterns noted in the data.

FIGURE 29: PERCENTAGE BINGE DRINKING BY AGE AND RACE/ETHNICITY, BRFSS, 1999-2003



Source: Connecticut Department of Public Health (DPH); BRFSS Survey, 1999-2003.

The high school youth population demonstrates significant race/ethnicity differences in smoking and drinking. As in other similar states and nationally, the young white population is more "at-risk" for alcohol abuse and smoking than the black or Hispanic population. One possibility is that this is a cultural phenomenon, buttressed by tobacco and alcohol industry marketing.

Recommendations

Changing binge drinking and smoking will require a broad effort to change both the level of information about the signs and consequences of alcohol abuse and tobacco use, changing cultural norms regarding alcohol and tobacco use, and the penalties for alcohol abuse, e.g., drunken driving and teen access to tobacco.

Additional programming in this area could be partly funded by greater disbursements from tobacco settlement money. Connecticut is currently far below the Centers for Disease Control and Prevention (CDC) minimum recommendation for tobacco prevention funding. In FY 2007, Connecticut was at 9.4 percent of the CDC recommendation, 36th of 45 states reporting.[208]

FOCUS AREA 5 — YOUTH RISKS AND OPPORTUNITIES

Findings and Analysis — Selected Indictors

Numerous investigations have examined youth risk behavior from the sociological, behavioral and even brain development perspectives. While the assumption had been that adolescent brain development was, like adolescence itself, a transitional stage between childhood and adulthood, research now indicates that changes in different areas of the brain play critical roles in memory, voluntary motor behavior, impulse control, decision making, planning, and other higher cognitive functions.[209]

Several measurable aspects of youth- and young-adult safety and behavior were selected as "indicator variables," including: child abuse; Connecticut Academic Performance Test (CAPT) participation and passing rates; high school graduation; school suspension and expulsion; sexually transmitted diseases; teen births; seat belt use; and bicycle helmet use, all presented in Chapter 4, Health Risk and Health-Promoting Behaviors. Also, implications of the statistics on membership in adult-sponsored, youth-promoting out-of-school organizations were presented in Chapter 3, Connecticut Community Profile.

Sexually Transmitted Disease and Teen Births

There are marked disparities in sexual risk-taking behavior among youth and young adults, as indicated in the sexually transmitted disease (STD) incidence rates and teen birth statistics.

Overall, the rate of STDs for black, non-Hispanic persons age 15 to 34 is 39.3 per 1,000; for Hispanics, 15.1 per 1,000; for white non-Hispanic 2.2 per 1,000; and for Asian non-Hispanic, 1.9 per 1,000. The rates are highest for black non-Hispanic persons in the Urban Centers — 53.5 per 1,000. In general, STD incidence rates peak in the late teens and decline after age 20. Further details are available in Chapter 4, Health Risk and Health-Promoting Behaviors.

Teen birth rates also show a marked disparity. Although the overall rate for Connecticut is 24.0 per 1,000, the rate climbs to 50.4 for black teens statewide, and 71.4 per 1,000 for Hispanic teens statewide. Within this group, Puerto Rican teens have an 84.8 per 1,000 rate, while non-Puerto Rican Hispanic teens have a rate of 44.3 per 1,000. Teen birth rates are generally elevated for all race and ethnicity groups in the Urban and Manufacturing centers. The highest rate is that of Puerto Rican Hispanic teens in the Urban Centers: 90.8 per 1,000.

Youth Seat Belt and Bicycle Helmet Use

Another indicator of risk taking is vehicle use without adequate protection. There are also marked disparities in these indicators. According to the 2005 Connecticut High School Survey (available at: http://www.dph.state.ct.us/PB/HISR/CSHS.htm) 73.1 percent of white male students statewide used a seat belt "all or most of the time," but only 46.1 percent of black male students and 56.0 percent of Hispanic male students did so. Rates for female students were higher for each group: 77.3 percent for white female students, 67.9 percent of black female students and 59.0 percent of Hispanic female students.

Self-reported bicycle helmet use, for students riding a bike during the past 12 months, was significantly lower for black (92.3 percent reporting never or rarely used) and Hispanic (89.9 percent) than for white students (70.6 percent). Similar race and ethnicity differences are noted on adult reports of their children's use of bicycle helmets as shown in Table 46. The rate of helmet use for all race and ethnicity groups is markedly too low.

Child Abuse

Abuse is a health risk for a significant number of Connecticut children. Reports of cases to Connecticut Department of Children and Families (DCF) and ED visits offer two types of data on the problem of child abuse. There is a large discrepancy between reports to DSS and ED visits because many more cases are reported to DCF than are coded in emergency departments. But the HRG patterns are similar, as they are for all age-adjusted ED-reported abuse rates.

Female children appear to be more at risk than male children. All children need better protection, especially those in the Urban Centers, Manufacturing Centers, Diverse Suburbs, and Mill Towns, as shown in Table 41 and Table 42 in Chapter 4, Health Risk and Health-Promoting Behaviors. The highest rates of DSS-reported abuse are for black and Hispanic youth.

Youth-Serving Organizations

Many community resources are available to help prevent health risks and poor health outcomes. These can include active out-of-school programs, such as Scouts and youth soccer and other sports.

Data on soccer and scouting participation by both boys and girls show a markedly lower rate of participation in the Urban and Manufacturing centers than in the state as a whole. This becomes problematic when data also show that other types of adult-sponsored activities for youth do not have high enough participation rates to make up the difference. For example, Boys and Girls Clubs serve primarily urban youth, yet they are estimated to serve fewer than one in 10 (8.8 percent) of all youth in the Urban Centers.

The Jack and Jill Clubs, an important mothers' volunteer program geared toward black and multiracial children and youth, have a membership estimated at 456 children in Connecticut, but only half of these members may reside in the Urban or Manufacturing centers. Thus, the vast majority of black and Hispanic children and youth appear not to be adequately involved in adult-sponsored, non-church-related organizations. The number involved in church-sponsored organizations is not known.

Recommendation

Broad initiatives on child and youth risk taking and safety could be focused especially on the Urban and Manufacturing centers, and on black and Hispanic children and youth, who are most at risk regarding a variety of safety and risk issues. These initiatives could include making available well-focused, out-of-school health promoting activities to youth in the neighborhoods in the Urban and Manufacturing centers, where such activities currently neither enroll many school-age children and youth nor attract sufficient adult volunteers. In addition, better data on youth out-of-school participation is a vital need.

FOCUS AREA 6 — IMPROVE THE HEALTH DATA SYSTEM

In preparing the *Data Scan*, the author had an opportunity to evaluate some aspects of the Connecticut "data system." It is actually not a system, but a series of separate "pots" of data in varied formats, each with its own strengths and weaknesses. This section is organized as a series of findings and recommendations.

Data Access

Finding

There are problems with the data access and coordination "infrastructure" in Connecticut that have been previously studied. Each request for other-than-standard web-based reports must be fulfilled separately by Connecticut state agency personnel — a time-consuming and costly process. Web-based reports are frequently presented only in portable document format (PDF) format, which makes secondary analyses and display of data more difficult.

Recommendation

A query-driven system would make the data more widely and easily available. A hypothesized pattern of health disparities would be less conjecture and more clearly demonstrated or refuted. More fine-tuned analyses below the state level — such as by HRG — would be possible and would not require state personnel to fulfill individual data requests.

Departmental Web Sites

Finding

Connecticut does not have a "one-stop shopping place" for broad community health data, in contrast to other states such as Florida, Utah, Missouri, and Massachusetts. At best, each Connecticut state department operates a separate "silo" for data. Each department's data is in a different format, with different and often inadequate access and search procedures. This produces great difficulty in searching for data and developing a broad picture of community health.

Recommendation

Provide a single community health web "portal" through which data and information about that data can be shared with the public. This will ease access problems, encourage standardization of procedures and data formats, and assist in more fruitful data search strategies. Encourage state agencies to take part in this "one-stop" effort.

Mapping

Finding

There is no accessible mapping capability for community health data in Connecticut. By comparison, in Massachusetts' Mass-CHIP system and in several other state systems data can be queried, graphed and mapped. This allows for great flexibility in analysis and presentation. It makes data available quickly to concerned citizens and policy-makers, as they need to analyze and display the information.

Recommendation

Encourage the inclusion of a mapping option in a query-based data system.

Data Delays

Finding

A previous analysis of the state of community health data in Connecticut indicated a number of structural weaknesses, culminating in delays in the release of data.[210]

State agencies and the public may not have a shared sense of what is reasonable. Frustration borne out of unshared expectations may occur because of time lags between when central authorities receive data and perform the necessary quality control on the data before publication. In addition, resource and infrastructure issues may lead to delay.

Recommendation

Interested organizations could work with state policy-makers to establish clear policies and standards based on reasonable expectations regarding the collection and release of data. Since timetables will be specific to different types of data, the public data consumer would further be helped by having lists of data items and realistic expectations of the time required to release data. For example, three years may be reasonable for Cancer Registry data to be issued in report format, but it may be unreasonably long for the reporting of infectious disease data. In addition, as practiced at the federal level, "preliminary data" could be released early and "final data" later in time.

Meta Data — Documentation about Data

Finding

There is a serious lack of "meta-data"— documentation about the data themselves — on the datasets accessed from many Connecticut agencies. For example, a particular dataset might use race and ethnicity as a variable to "group" health observations. Meta-data would be information about how race and ethnicity are defined for that particular dataset. For many indicators, the author had to piece together meta-data in preparing this report.

Recommendation

Support the establishment of a standard for meta-data with the clear expectation that all state agency reports will follow it. This would be easy to do when creating new datasets because much less labor is required to create meta-data as new datasets are being created — rather than to find the information at a much later date.

Youth Data

Finding

Despite the recognized importance of out-of-school program participation, there is neither a comprehensive dataset on this key indicator nor a way to systematically estimate it. There has also been a serious weakness in the collection of YRBS data in the recent past. For several iterations of the YRBS, data were not collected or the CDC has not "weighted" the Connecticut data, due apparently to a lower than acceptable response rate. Data collection for the 2005 YRBS was sufficient for CDC weighting — allowing for statistical inferences from the data.

Recommendation

The Connecticut departments of Public Health and Education could investigate and help strengthen the capacity to collect youth data. One method used in Massachusetts is to add items to that state's equivalent of the Connecticut Academic Performance Test (CAPT), asking about the type and frequency of out-of-school program participation by each child.

The departments could choose noncontroversial items about students' after-school activities, including homework, clubs, sports, and TV watching and make them an addendum to the CAPT testing, so that universal coverage for the relevant grades could be obtained. Doing so will allow for population-based estimates by school district, by HRG, and/or by race and ethnicity group. The data would also be useful to individuals districts in diagnosing student performance.

Health Observations

Finding

Observation-based health data are lacking in many areas — such as youth safety that includes seat belt use; bicycle helmet use; the prevalence of violence promoting graffiti in a neighborhood; the availability, conditions, use of public spaces for exercise; and the amount of smoking on school property and at school-sponsored events. Observation would be useful, but expensive, if done in the traditional manner — hiring observers. There appears to be no current capability to collect such data on a systematic basis.

Recommendation

Support community-based research partnerships such as those pioneered by the Youth Action Research Institute of Hartford's Institute for Community Research[211] to work with public school students and other youth to collect community-oriented data as part of a larger statewide project.

This kind of data collection and analysis falls completely within the requirements of the Connecticut Mathematics Curriculum Frameworks Content Standards and Expected Performances. For example, one framework requires collecting, organizing, and displaying data help to analyze information and make reasonable predictions and informed decisions.[212]

With its connection to required school work, this innovative strategy offers the advantages of:

- Collecting needed health data;
- Encouraging student interest in learning about their communities in a prosocial way and taking action based on their findings;
- Raising students' interest in their own health; and
- Fulfilling school curriculum requirements.

Partnerships among community agencies, universities, and schools would "improve teachers' and students' understanding of sampling, surveys, and observational strategies,"[213] as well as obtain vital data for health assessments.

Race and Ethnicity Categories

Finding

The broad-brush approach to race and ethnicity identification misses significant variation. For example, in this report the Puerto Rican Hispanic teen birth rate appears to be more than double the non-Puerto Rican Hispanic teen birth rate. Yet most datasets do not include this subgroup code. There may be similar disparities within broad race and ethnicity groups, such as between Chinese, Vietnamese and Cambodian Asians. Given most current practices in subgroup data collection and reporting, there is no way to verify whether these subgroups are at particular risk. Finally, most datasets do not include biracial reporting categories. Yet, biracial individuals on many indicators have different health profiles than either of their "monoracial" components.[o, 214] Biracial individuals are becoming numerically more important as residents increasingly insist on reflecting all parts of their heritages and as the rate of biracial marriages increases.

Recommendation

Encourage agencies, wherever possible, to obtain more specific race and ethnicity identification, including biracial identification, consistent with federal Office of Management and Budget (OMB) Directive 15 (1997 Revision) and U.S. Census Bureau practice, and make the results available in more fine-tuned analyses. Doing so will permit better targeting of interventions.

Health Care Quality

Finding

There are significant problems in conceptualizing and operationalizing health care quality data in Connecticut. The current method of obtaining hospital adverse event data leads to what appear to be significant underestimates. There also are no broad and agreed-upon standards for "adjusting" data for patient acuity.

Recommendation

Support development of an agreed-upon overall quality "index" that would help the public to know whether or not health care quality is getting better. Subsections of the index could indicate which sectors are leading and which are lagging in improvement. The index also could be constructed to reveal disparities in the quality of care, with adequate controls for appropriateness of care, patient choice and co-morbidities. Given anticipated difficulties, this could be a long-term project.

Mental Health Data

Finding

The mental health data system remains problematic despite efforts to improve it and to implement the Center for Mental Health Services (CMHS) Uniform Reporting System (URS) dataset and standards. Some data in the federal submissions under URS seem contradictory or beg further explanation. But the format of the reporting tables does not contain enough helpful explanatory documentation (meta-data).

There is a fragmentation of data reporting, lack of online data capability, and a lack of readily accessible information about the agencies' data definitions and the connection of particular datasets to specific programs. Information exists in the historical memories of individual staff but is not documented adequately to guide outside researchers.

Recommendation

Support the development of better organized mental health data — and make the data and information documentation about it available online to promote an educated citizenry about this important area.

A NOTE ABOUT ADDITIONAL ISSUES

Many important issues are not a focus of this report's recommendations. This is generally because, although there may be disparities, there are not clear science-based interventions of proven efficacy for reducing these rates or disparities.

This report did not focus specifically on investigating oral health and mental health due to Connecticut Health Foundation's (CHF) current investments in these areas. Some data were obtained that are pertinent to these issues and are reported here.

Mental Health

The BRFSS indicates that 8.2 percent of Connecticut residents 18 and over self-report poor mental health 15 or more days in the past month. There is little variation by HRG on this indicator: 10.0 percent (age-adjusted) for the Urban Centers; 8.6 percent for the Manufacturing Centers; 9.2 percent for the Diverse Suburbs; 6.1 percent for the Wealthy Suburbs; 8.6 percent for the Mill Towns; and 7.0 percent for the Rural Towns. There do not appear to be significant race- and ethnicity-specific differences in mental health status, except for Asians, whose statewide rate — 4.6 percent — is significantly lower on the poor mental health indicator.

The federal government publishes estimates of adults' and youths' need for mental health treatment. The 2004 Connecticut estimate for "serious mental illness" was 143,493.

Recent national data indicate that, on interview, 6.3 percent of parents thought that a son in the age range, 4 to 17 years old had "definite or severe difficulties with emotions, concentration, behavior, or being able to get along with others." This was true for only 3.3 percent of girls in the same age range.

The data show statistically significant race and ethnicity differences: 8.3 percent of black boys were assessed by a parent to have such difficulties, as compared with 6.6 percent of white boys, and 4.7 percent of Hispanic or Latino boys.

The comparable — but not statistically different — rates for girls the same age were: 3.8 percent of white girls, 2.7 percent of black girls, and 2.6 percent of Hispanic or Latino girls.

The family structure "mother present, no father in the household" was also associated with higher rates of perceived difficulties.[215]

See Appendix M for further discussion of mental health in Connecticut and www.cthealth.org for selected data.

Oral Health

Overall, 79.2 percent of Connecticut residents reported a "past year" dental visit in the previous year. This rate varies by HRG in that only 71.8 percent of the Urban Center residents 18 and over reported a visit, 73.9 percent of Manufacturing Center residents, 77.3 percent of Diverse Suburbs residents, 85.8 percent of Wealthy Suburb residents, 80.5 percent of Mill Town residents, and 83.6 percent of Rural Town residents.

Dental visits varied significantly by race and ethnicity: 81.7 percent of white residents, 72.2 percent of Asian residents, 66.5 percent of black residents, and 65.8 percent of Hispanic residents.

There are no overall data about oral health for children in Connecticut. Recent 2005 data prepared by Connecticut Voices for Children regarding children 3 to 19 continuously enrolled in HUSKY A, Connecticut's Medicaid managed care program, indicate that approximately 41 percent of the children involved in that program received preventive oral health care, and 22 percent received treatment. Both of these rates were virtually unchanged from 2004.

The child's age was the chief variable in preventive care and treatment, from a low of 38 percent in the 3- to 5-year-old age group to 51 percent in the 6- to 8-year-old group, 49 percent between 9 and 11 years old, 42 percent age 12-14, and 28 percent age 15-19. These percentages were virtually unchanged from 2004.

Hispanic children in HUSKY A had the highest rate of preventive care (44 percent), while black and white children each had a 39 percent rate. "Other" children had a 44 percent rate. These rates were unchanged from 2004. Treatment rates showed a slightly different pattern: 26 percent of "other" children were treated, followed by 23 percent of Hispanic children, 21 percent of white children, and 20 percent of black children.[216]

Additional data obtained from Connecticut Voices for Children have demonstrated expected differences by HRG in the percentage of children enrolled in HUSKY A, but only slight differences among HRGs in the percentages of participation of HUSKY A enrollees in dental care.[217]

TABLE 123: CHILDREN AGE 3-19 CONTINUOUSLY ENROLLED IN HUSKY A, 2004

AREA	Population		Percentage Enrollment	Any Dental Care		Preventive Dental Care		Treatment Dental Care	
	Enrolled, 2004	Population 3-19, 2000		N	%	N	%	N	%
HRG 1 (3)-UC	45,966	104,469	44.0	23,594	51.3	19,002	41.3	10,094	22.0
HRG 2 (10)-MC	43,263	146,266	29.6	19,829	45.8	17,108	39.5	8,649	20.0
HRG 3 (15)-DS	23,440	127,728	18.4	10,621	45.3	9,090	38.8	4,788	20.4
HRG 4 (27)-WS	4,141	122,050	3.4	1,795	43.3	1,553	37.5	886	21.4
HRG 5 (39)-MT	18,776	153,571	12.2	8,731	46.5	7,651	40.7	3,998	21.3
HRG 6 (75)-RT	10,333	140,805	7.3	4,523	43.8	3,984	38.6	2,098	20.3
Unknown	679	-	-	326	48.0	296	43.6	163	24.0
Total	146,598	794,889	18.4	69,419	47.4	58,684	40.0	30,676	20.9

Source: Connecticut Voices for Children; U.S. Census 2000, SF1: Table P12.

OVERALL COMMENT ON THE FINDINGS AND RECOMMENDATIONS

Some of the findings and recommendations in this report may be more difficult than others to embrace and implement. This is partly because they locate the problem at all levels of the "system": state, health provider, corporate, community, family, peer group and individual. Each level may require work for the health outcome to change. Changing cultural norms will be important as well.

Focusing on diabetes, for example, and more generally on the metabolic syndrome, will require changes in how primary care providers counsel patients about issues of obesity, diet and exercise. It will require changes in how parents understand and implement their responsibilities regarding their children's diet, exercise and TV-watching.

Focusing on metabolic syndrome diseases will also require changing community-specific cultural norms about food and exercise, as well as limiting the "selling" of residents and their children on unhealthy diets. The state will need to expand its capacity to collect population-based data on children and youth to make better estimates of the extent of their out-of-school activities and risk behaviors.

The effort will require policy changes — such as school bus and school lunch policies — and providing more opportunities and support for safe walking, rollerblading and biking to school, to work and for recreation. Transportation policy has a significant role to play.

In summary, a systems view will require supporting investigations and action in each part of the causal chain to improve health outcomes for current and future residents of Connecticut.

APPENDICES

APPENDIX A

LIST OF CITIES AND TOWNS AND ASSOCIATED HEALTH REFERENCE GROUPS

TABLE 124: LIST OF CITIES AND TOWNS AND ASSOCIATED HEALTH REFERENCE GROUPS

TOWN	HRG	TOWN	HRG	TOWN	HRG
Bridgeport	1	Avon	4	Bethel	5
Hartford	1	Bridgewater	4	Branford	5
New Haven	1	Brookfield	4	Brooklyn	5
Danbury	2	Fairfield	4	Griswold	5
East Hartford	2	Greenwich	4	Lisbon	5
Meriden	2	New Canaan	4	North Canaan	5
New Britain	2	Old Lyme	4	Plainville	5
New London	2	Redding	4	Plymouth	5
Norwalk	2	Ridgefield	4	Putnam	5
Stamford	2	Simsbury	4	Seymour	5
Waterbury	2	Weston	4	Southington	5
West Haven	2	Wilton	4	Stafford	5
Windham	2	Woodbridge	4	Sterling	5
Ansonia	3	Darien	4	Cromwell	5
Bloomfield	3	Easton	4	East Haven	5
Bristol	3	Essex	4	East Windsor	5
Derby	3	Glastonbury	4	Killingly	5
Enfield	3	Guilford	4	Mansfield	5
Groton	3	Killingworth	4	Milford	5
Hamden	3	Lyme	4	Montville	5
Manchester	3	Madison	4	Newington	5
Middletown	3	New Fairfield	4	North Haven	5
Naugatuck	3	Newtown	4	Plainfield	5
Norwich	3	Roxbury	4	Rocky Hill	5
Stratford	3	Trumbull	4	Shelton	5
Vernon	3	Washington	4	Somers	5
West Hartford	3	Westport	4	Sprague	5
Windsor	3			Stonington	5
				Thomaston	5
				Thompson	5
				Torrington	5
				Wallingford	5
				Waterford	5
				Watertown	5
				Wethersfield	5
				Willington	5
				Winchester	5
				Windsor Locks	5
				Wolcott	5

Note: Health Reference Groups (HRGs): (1) Urban Centers, (2) Manufacturing Centers, (3) Diverse Suburbs, (4) Wealthy Suburbs, (5) Mill Towns, (6) Rural Towns.

(CONTINUED)

TABLE 124: LIST OF CITIES AND TOWNS AND ASSOCIATED HEALTH REFERENCE GROUPS

TOWN	HRG	TOWN	HRG
Andover	6	Harwinton	6
Ashford	6	Hebron	6
Barkhamsted	6	Kent	6
Beacon Falls	6	Lebanon	6
Berlin	6	Ledyard	6
Bethany	6	Litchfield	6
Bethlehem	6	Marlborough	6
Bolton	6	Middlebury	6
Bozrah	6	Middlefield	6
Burlington	6	Monroe	6
Canaan	6	Morris	6
Canterbury	6	New Hartford	6
Canton	6	New Milford	6
Chaplin	6	No. Stonington	6
Cheshire	6	Norfolk	6
Chester	6	North Branford	6
Clinton	6	Old Saybrook	6
Colchester	6	Orange	6
Colebrook	6	Oxford	6
Columbia	6	Pomfret	6
Cornwall	6	Portland	6
Coventry	6	Preston	6
Deep River	6	Prospect	6
Durham	6	Salem	6
East Granby	6	Salisbury	6
East Haddam	6	Scotland	6
East Hampton	6	Sharon	6
East Lyme	6	Sherman	6
Eastford	6	South Windsor	6
Ellington	6	Southbury	6
Farmington	6	Suffield	6
Franklin	6	Tolland	6
Goshen	6	Union	6
Granby	6	Voluntown	6
Haddam	6	Warren	6
Hampton	6	Westbrook	6
Hartland	6	Woodbury	6
		Woodstock	6

Note: Health Reference Groups (HRGs): (1) Urban Centers, (2) Manufacturing Centers, (3) Diverse Suburbs, (4) Wealthy Suburbs, (5) Mill Towns, (6) Rural Towns.

APPENDIX B

HISTORICAL GEOGRAPHY OF CONNECTICUT CITIES AND TOWNS AND HEALTH REFERENCE GROUPS

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INTRODUCTION

The cluster analysis of Connecticut towns reveals six types of towns that are consistent with the economic and demographic development of the state. For ease of discussion, the six clusters are labeled as follows (number of towns in parentheses): Cluster 1: Urban Centers (3); Cluster 2: Manufacturing Centers (10); Cluster 3: Diverse Suburbs (15); Cluster 4: Wealthy Suburbs (27); Cluster 5: Mill Towns (39); and Cluster 6: Rural Towns (75). These labels are explained in the following discussion by first reviewing the general patterns of economic and demographic change since the late 1700s. These patterns are then discussed with respect to each kind of community.

HISTORICAL OVERVIEW

The geographic pattern seen in the Health Reference Group (HRG) map in the Executive Summary Appendix and at www.cthealth.org is the result of historical patterns of demographic change and regional economic development since the end of the colonial period (ca. 1790). The initial economic and population geography of preindustrial Connecticut was that of a predominantly rural state of small nucleated villages driven by its physical geography.[218] The largest population concentrations were in the external trading port cities along the coast (e.g., New London, Bridgeport and New Haven) and the internal trading cities along the Connecticut River (e.g., Hartford and Middletown). The first significant change to this pattern was agricultural depopulation. Throughout the entire 19th century population pressures on the relatively poor agricultural land of Connecticut caused large numbers of people to migrate either to better agricultural land in the west or toward job opportunities in emerging industrial cities.

Agricultural out-migration affected every town in Connecticut but is most evident today in the large number of towns that were not significantly affected by any of the subsequent events discussed below. In many cases these towns have populations that are smaller than they were in 1800. Union, in northeastern Connecticut, and Norfolk, in northwestern Connecticut are two good examples: According to the U.S. Census Bureau, Union had a population of 767 in 1800 but only 693 in 2000, and Norfolk had a population of 1,649 in 1800 but only 1,660 in 2000. The 75 Rural Towns identified in the HRG analysis generally fall into this category.

The physical landscape of Connecticut was most dramatically altered after 1790 with the diffusion of the Industrial Revolution from England via Rhode Island.[219] The first industries were based on water-powered mills placed along the many fast-moving streams throughout the region. Numerous mill towns sprang up throughout Connecticut between 1800 and 1820, especially in the Quinebaug and Willimantic river valleys of eastern Connecticut. All of the Manufacturing Centers and Mill Towns identified in the cluster analysis were significantly influenced by early industrialization.

By 1830 the primary power source for industry was steam power and the need to locate factories along streams declined. This had several effects: First, the existing large population centers along the coast and the Connecticut River saw an influx of industry and population growth. Up to about 1910 most of the population growth in these industrial cities came from rural to urban migration within Connecticut or from European immigrants. After 1910, population growth in the industrial centers came largely from the influx of rural, southern blacks. Even later, Puerto Rican migrants, by way of New York City, also began to move to industrial job opportunities in Connecticut's larger cities. Second, only those original mill towns which had established large, nationally dominant industries were able to make the transition to the new energy source (e.g., Windham and New Britain). These towns also experienced the in-migration of blacks after 1910 and Hispanics in the mid-1900s. While these cities became more demographically diverse, economic health was later hindered by their lack of a diverse economic base. Third, the remaining older, smaller mill towns that were less successful suffered a severe economic decline from which they have yet to emerge (e.g., Killingly and Brooklyn). Also, without a growing demand for workers in the 20th century, these original mill towns never experienced the large scale in-migration of black and Hispanic workers.

By 1900 the populations of the larger cities both within and bordering Connecticut began to suburbanize.[220] The suburbanization trend intensified after World War II because of transportation technology improvements, federal government policies, increasing incomes, and demographic changes. Suburbanization was especially prevalent in Fairfield County and around Hartford and New Haven. Suburban sprawl continues to transform Connecticut's demographic landscape.

The final process that dramatically changed the Connecticut landscape since the 1950s is deindustrialization.[221] The industrial decline hit the three Urban Centers hard, the less diversified Manufacturing Centers harder and the Mill Towns hardest. The Urban Centers were not affected as much because they had a more diverse economic base. The more specialized and smaller Manufacturing Centers and Mill Towns have been unable to recover from the loss of their basic industries.

SUMMARY OF HEALTH REFERENCE GROUP HISTORICAL GEOGRAPHY

The three Urban Centers are traditionally large population centers that benefited after 1830 from the movement of industry from small mill towns to larger population centers. These towns were initially large enough, however, that the growth of industry merely added to the economic mix. Their populations became more diverse throughout the 20th century with the in-migration of blacks first and then Hispanics later. Post-World War II suburbanization and deindustrialization, however, have helped create large concentrations of poor "persons of color" within these Urban Centers.

The 10 Manufacturing Centers are the most successful of the early-1800s mill towns. Early industries in these towns became highly specialized, dominated national markets and flourished in the 1800s and even into the 1900s.

For example, Danbury was synonymous with hats, Waterbury with precision manufacturing, Windham with thread, and New Britain with hardware. As the white population became better educated, demand for manufacturing labor in the 20th century was met through the in-migration of blacks and Hispanics. With suburbanization and deindustrialization these cities and their populations have suffered. Their poverty and economic development problems are much more significant than those of the three Urban Centers because they have a less diverse economic base.

The 15 Diverse Suburbs are not as readily defined and may be thought of as a set of relatively dense, medium-sized towns with diverse populations. Some of these towns, such as Manchester and Vernon, were medium-sized mill towns. Their stories would be similar to those of other such towns except that these towns are located close enough to large population clusters that they have benefited by becoming suburban communities. Another subset of the Diverse Suburbs is more properly labeled as inner-ring suburbs. Hamden and West Hartford, for example, experienced the first wave of suburbanization after 1900. They have an older housing stock and an increasingly diverse population, but their stability is ensured through demand for their housing and good educational opportunities. In any event, the Diverse Suburbs are quite similar in the age of their housing stock, density, population size, and population diversity.

The 27 Wealthy Suburbs were largely untouched by industrialization and retained their rural character well into the 1900s. Improvements in transportation, increasing incomes, demographic change, and federal government policies all contributed to their suburbanization after World War II. These towns are generally located in Fairfield County adjacent to New York City, around the two traditional population clusters of Hartford and New Haven or along the Long Island Sound. These are generally the wealthiest suburban communities in the state.

The 39 Mill Towns are generally the smaller and earlier mill towns that never succeeded on a national scale. Their industrial base was retained until recently, but their slow growth in the 1900s meant they never experienced large black or Hispanic immigration. Thus, these cities face many of the same problems of entrenched poverty as the larger Manufacturing Centers, but these towns are not as large and their populations are predominately white.

Finally the 75 Rural Towns were largely untouched by industrialization, suburbanization, or deindustrialization. Their populations consist of people whose families have lived in town for generations (if not centuries). For various reasons (e.g., distance and lack of transportation infrastructure), the Rural Towns have escaped large-scale suburbanization. This is not to say that suburbanization has not influenced their character. Many of these towns have seen the development of low density, high-end housing by wealthy in-migrants. Thus the Rural Towns are facing some degree of conflict over the loss of their rural character and over the provision of town services. However, these towns remain relatively rural, low-density, residential communities with a traditional New England landscape.

APPENDIX C

AN ANALYSIS OF SEGREGATION AND "HYPERSEGREGATION" IN CONNECTICUT

INTRODUCTION

There is an extensive literature on segregation and health, mainly focused on black residential segregation and health. This research literature indicates that black residents typically have larger health risks and poorer health outcomes than any other large race or ethnicity group. Reviewing a substantial number of studies, Acavedo-Garcia et al have concluded that "black mortality is positively associated with residential segregation … and with residence in predominately black areas."[222] The causal linkages are complex. Black-headed households are more likely to be below the federal poverty criteria and more "single female headed" than white-headed households, and poverty, family structure and health risk and outcome are all associated.

Health risk and outcome appear to be predicted by race beyond what would be expected on the basis of poverty differences alone.[223, 224] This raises significant questions about the effects of neighborhood context — specifically, whether the observed health rate disparities are due to some consequence of black residents' living in neighborhoods that are overwhelmingly black. Conversely, do black residents who live in more racially diverse neighborhoods have better health? Or do black residents of a neighborhood that is largely black but adjacent to nonblack neighborhoods do better or worse than if they lived in a largely black neighborhood surrounded by other largely black neighborhoods?

In response to such questions, researchers have defined many different indicators of racial segregation, and they have focused especially on black segregation because black-white differences in health have been the starkest (although black-Asian differences are even larger, as reported in the *Data Scan*). It also appears that black-white patterns of segregation are the most resistant to change.

Connecticut has neighborhoods with large percentages of black and Hispanic residents. This appendix provides a map of black and Hispanic neighborhoods — it is also available at www.cthealth.org — to examine whether there is evidence of differing degrees of race and ethnicity segregation.

INDICATORS OF SEGREGATION

The word "segregation" requires further definition. The literature defines several distinct aspects of segregation: dissimilarity, isolation, clustering, centralization, and concentration.[225, 226, 227, 228, 229, 230, 231, 232]

Dissimilarity: The percentage of a group's population that would have to change residence for each neighborhood in a metropolitan area to have the same percentage of that group as in the metropolitan area as a whole. In a simple illustration: If the total population in census tract 1 in the Hartford metropolitan area were 5,000 and the black population were 4,000, then they provide 80 percent of this population. If the overall population in the Hartford Standard Metropolitan Statistical Area (SMSA) were 10 percent black,

then all but 500 of the black residents in census tract 1 would have to move to other areas to "even out" the population, so that census tract 1 would contain a 10 percent black population as well.

There have been objections about a subtle bias in this definition in that it focuses all of the moving on black residents.[233, 234] Yet health deficits are typically found in highly segregated black neighborhoods, not in highly segregated white or Asian neighborhoods. In addition the pattern of segregation does not represent only individual choice, but rather entrenched patterns of "steering" (or, less often according to the literature, self-steering) black residents primarily to majority black neighborhoods. Therefore the concern should be with white-black patterns of segregation and on policies that either reduce segregated housing and/or ameliorate the effects of these housing patterns.

Isolation: Where the average member of a "minority group" in question lives. This value would be one if all members of a particular minority group within a metropolitan area lived only in census tracts with other members of the same group. The assumption underlying this criterion is that there would be little opportunity for cross-racial interaction, and minority group persons would be isolated from majority, e.g., white, interaction.

Concentration: The amount of physical space taken up by members of a minority group, relative to other groups. For example, if 1,000 black residents take up one square mile of space in a metropolitan area, while 100,000 white residents take up 500 square miles, then the density of blacks is 1,000 per square mile and the density of whites in 100,000/500 = 200 per square mile. The relative concentration is, therefore, 1,000/200 = 5:1.

Centralization: The extent to which black residents live in the "central city" as opposed to outlying (suburban) areas. For example, if all black residents of the Hartford SMSA resided in the central area of Hartford, the black population would be highly centralized. To the extent that some live outside of central Hartford (e.g., West Hartford) but within the Hartford SMSA, the black population in the SMSA is less centralized.

Clustering: The extent to which the census tracts (or other small enumeration areas) with a large proportion of black residents are adjacent to or close to other census tracts also with a high proportion of black residents.

Each of these indicators has subindicators of slightly different definition.

Hypersegregation: The extent to which dissimilarity, isolation, concentration, centralization, and clustering occur simultaneously in a given environment.

The five indicators are theoretically independent. That is, it would be possible for an area to be high on one indicator and low on another. Blacks might be isolated, in the sense that they were totally segregated into one census tract. Yet their density within this tract might be much lower than that of whites in surrounding all-white tracts. So in this example, black residents would be high on the isolation scale but low on the concentration scale and low on the clustering scale. However, the analysis of real data shows that, over the entire country, black residents are more likely than any other group to be segregated on any one index, and are virtually alone in being simultaneously segregated on all five indicators. This phenomenon of multiple indicator segregation has become known as "hypersegregation."

Hypersegregation refers to the intersection and cumulative effect of different aspects of segregation that may influence the lives of black and Hispanic residents in the Urban Centers. For example, hypersegregated areas appear to have higher crime rates than would be expected based on race and other demographic factors alone.[235]

There is only one standard metropolitan statistical area — Hartford SMSA — in Connecticut for which a segregation analysis has been reported in the published literature. Hartford SMSA covers more than 40 towns with almost 1.2 million in population. The most recent analysis shows that for black segregation as measured by the dissimilarity or "D" index, Hartford SMSA is ranked 56th of 331 SMSAs nationwide. The Hartford SMSA is ranked 25th among 61 SMSAs with at least one million total population. For Hispanic segregation, Hartford SMSA is seventh of all 331 metropolitan areas and fourth of 61 metropolitan areas over one million total population.[236] It appears that Hispanic segregation in the Hartford SMSA is more intense, at least according to the D index, than black segregation. Of course the ranking is relative to that experienced by blacks and Hispanics in other cities.

Nationwide, black segregation is more intense than Hispanic segregation. Asian segregation is least prevalent. But there are complexities when considering race and ethnicity sub-categories in Connecticut. In particular there appear to be differences within the Hispanic population, e.g., for Puerto Rican versus non-Puerto Rican Hispanics. In addition, not all Connecticut cities and towns may follow the pattern of the Hartford SMSA. An alternative method for assessing segregation has been constructed, one that takes into account all areas of Connecticut.

ALTERNATIVE MEASURES OF SEGREGATION

Dissimilarity

An alternative and simple test of the relative degree of segregation for black, Hispanic and Asian residents is the number of census tracts that must be cumulated to arrive at 50 percent or, alternatively, 75 percent or 90 percent of all residents of a particular race/ethnicity. This index functions somewhat like the D or dissimilarity index reported in the published literature. It will be referred to as the D_X index.

The range of population sizes in Connecticut census tracts is from less than 100 to more than 11,000. Ninety percent of Connecticut's 815 census tracts have between 1,723 and 7,173 total population. The expected numbers of census tracts to account for a specified percentage of each race/ethnicity/ancestry group are based on the cumulative population in all race and ethnicity groups. That is, 50 percent of the total Connecticut population reside in the top 284 census tracts, 75 percent reside in the top 489, and 90 percent reside in the top 647 census tracts for population size. If all race/ethnicity/ancestry groups were evenly distributed throughout the state, the number of census tracts required to account for their populations would be the same.[P]

Results in Table 125 indicate the observed distributions of D_X for each selected race/ethnicity/ancestry group. Under these tests, black residents statewide are most segregated, followed by Hispanic residents and, lastly, by Asian residents. This stands in some contrast to the results reported by Wilkes (see endnotes 225 and 236 for reference) for the Hartford SMSA, where Hispanic residents appeared more segregated — but Wilke's results are based on five indicators of segregation, not one, and apply only to the Hartford SMSA, not the entire state.

White-alone, non-Hispanic residents are least segregated on D_X, since 246 census tracts must be cumulated to account for 50 percent of the white population, whereas the expected number is 284 census tracts, if all groups were evenly distributed. These results are portrayed in Table 124. Polish and English ancestry persons have been added for comparison.

TABLE 125: POPULATION SEGREGATION ON D_X BY RACE AND ETHNICITY, BY CENSUS TRACT

RACE/ETHNICITY/ANCESTRY	Number of Tracts Aggregated to Account for 50 percent of Resident Population (Expected # is 284)	Number of Tracts Aggregated to Account for 75 percent of Resident Population (Expected # is 489)	Number of Tracts Aggregated to Account for 90 percent of Resident Population (Expected # is 647)
Black-alone, Not Hispanic	77	179	316
Hispanic Ethnicity	98	218	414
Puerto Rican	76	168	326
All Non-Puerto Rican	101	268	476
South American	75	223	423
Asian-alone, Not Hispanic	151	330	516
Chinese	120	274	446
Indian	117	276	449
Vietnamese	67	180	317
Polish First Ancestry	183	351	502
English First Ancestry	203	374	526
White-alone, Not Hispanic	246	430	579

Source: U.S. Census 2000, SF1: Tables P1,P4,DP-1; SF3: PCT 16.

Puerto Rican residents are more segregated on D_X than are non-Puerto Rican Hispanic residents as a whole, and they are segregated about equally with black residents. Vietnamese residents are more segregated than other Asian residents. Further analysis of U.S. Census Bureau ancestry tables (from census "long form" sample estimates in U.S. Census file SF3), indicate that Polish "first ancestry" segregation is higher than English "first ancestry" segregation on D_X.

Concentration

The "concentration index" used by Wilkes and others suggests an additional test of segregation. This is the density per square mile of a particular "minority" group relative to white residents. The *Data Scan* version — C_X — of this index shows the average density per square mile for various percentages of each population group. Table 126 shows the population concentration (C_X) for major race and ethnicity groups in Connecticut. The results are clear: Hispanic residents are more concentrated, on average, than black residents, and black residents live in far more crowded conditions than Asian or white residents.

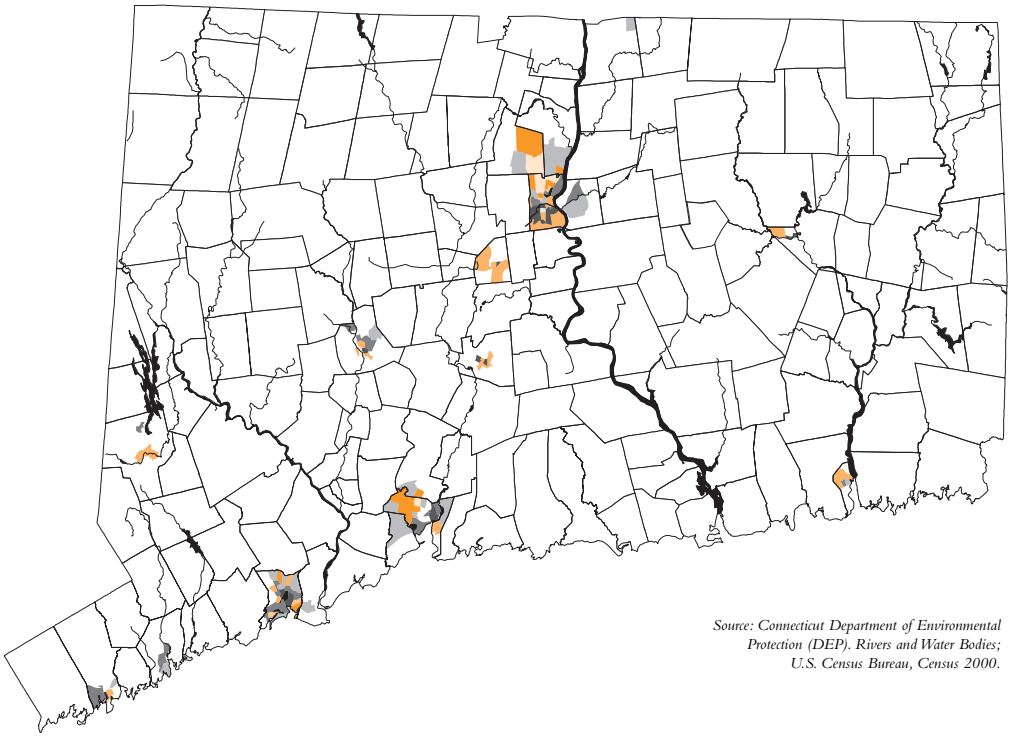
TABLE 126: POPULATION CONCENTRATION, Cx BY RACE AND ETHNICITY, BY CENSUS TRACT

RACE/ETHNICITY GROUP	Average Density per Square Mile of Total Population in Census Tracts Accounting for First 50 percent of Group Population	Average Density per Square Mile of Total Population in Census Tracts Accounting for Last 5 percent of Group Population
Black-alone, Not Hispanic	9,217	1,286
Hispanic Ethnicity	11,460	958
Puerto Rican	12,304	1,245
Asian-alone, Not Hispanic	4,587	3,890
White-alone Not Hispanic	1,576	8,434

Source: U.S. Census 2000, SF1: Tables DP-1, GCT-PH1.

Fifty percent of white residents live in census tracts that have, on average, only 1,576 total population density per square mile. The last 5 percent of census tracts accounting for the white, non-Hispanic population have on average 8,434 persons per square mile. Thus, most white, non-Hispanic persons have relatively spacious living, and only a small percentage (5 percent) occupy census tracts that come close to the crowded conditions of half of the black and Hispanic residents of Connecticut. The concentration of black and Hispanic residents is mapped in Figure 30.

FIGURE 30: CONCENTRATION OF BLACK RACE ALONE, NOT HISPANIC, AND HISPANIC RESIDENTS



Source: Connecticut Department of Environmental Protection (DEP). Rivers and Water Bodies; U.S. Census Bureau, Census 2000.

For a full color map go to www.cthealth.org.

APPENDIX D

FIRST ANCESTRY DISTRIBUTION FOR CONNECTICUT

TABLE 127: FIRST ANCESTRY REPORTED, NUMBER AND PERCENTAGE, U.S. CENSUS 2000

ANCESTRY GROUP	Number Reporting	Percent
Other groups	589,521	19.9
Italian	536,498	18.1
Unclassified or not reported	448,800	15.2
Irish	367,892	12.4
English	215,482	7.3
Polish	199,883	6.8
German	188,047	6.4
French (except Basque)	130,655	4.4
United States or American	110,615	3.7
French Canadian	86,986	2.9
West Indian: (excluding Hispanic groups)	49,435	1.7
Russian	46,058	1.6
Scottish	39,424	1.3
Swedish	38,555	1.3
Portuguese	36,255	1.2
Scotch-Irish	27,844	0.9
Hungarian	25,208	0.9
Greek	21,968	0.7
Lithuanian	19,762	0.7
Sub-Saharan African: all subgroups	17,462	0.6
Ukrainian	16,162	0.5
European	14,456	0.5
Norwegian	14,008	0.5
Slovak	13,907	0.5
Dutch	13,721	0.5
British	12,818	0.4
Arab: (all subgroups)	11,448	0.4
Canadian	10,952	0.4
Brazilian	9,366	0.3
Austrian	8,519	0.3
Danish	7,935	0.3
Welsh	7,029	0.2
Albanian	6,583	0.2
Eastern European	6,407	0.2
Czech	5,849	0.2
Lebanese	5,830	0.2
Czechoslovakian	5,657	0.2
Swiss	5,606	0.2
Finnish	4,236	0.1
Romanian	4,124	0.1
Armenian	3,862	0.1
Yugoslavian	2,970	0.1

Source: U.S. Census 2000, SF3: Table PCT16.

APPENDIX E

SAFETY NET DATA

TABLE 128: DEMOGRAPHIC INDICATORS OF CHILD WELL-BEING, CONNECTICUT, 2000

KEY INDICATOR OF CHILD WELL-BEING	Connecticut		United States	
	Number	Percentage	Number	Percentage
Population under age 18 below poverty	85,908	10.4	11,746,858	16.6
Own children in single-parent households	192,938	22.9	16,812,254	23.3
Population ages 16-19 who are high school dropouts	12,580	7.4	1,566,039	9.8
Children ages 5 to 17 who have difficulty speaking English	31,705	5.1	3,493,118	6.6
Children ages 5-15 with one or more disabilities	28,990	5.5	2,614,919	5.8
Children living in high-poverty neighborhoods (where 20% or more of the population is below poverty)	101,951	12.1	14,746,918	20.4

Source: "KIDS COUNT Census Data." Population Reference Bureau analysis of data from the U.S. Census Bureau, for The Annie E. Casey Foundation. 2000. Available at: http://www.aecf.org/cgibin/aeccensus.cgi?action=profileresults&area=09S.

TABLE 129: CHILD AND INFANT MORTALITY DATA FOR CONNECTICUT, 2000

Connecticut Population, Ages 0-19	Total Deaths, Ages 0-19	Child Mortality Rate (Deaths/100,000 population)
884,330	462	52.2
Number of Live Births	**Number of Infant Deaths, Ages 0-1**	**Infant Mortality Rate (Deaths/1,000 Live Births)**
43,026	282	6.6

Source: U.S. Department of Health and Human Services (HHS) – National Maternal and Child Health Bureau. "National MCH Center for Child Death Review – Connecticut Child Mortality Data, 2000 from National Center for Health Statistics." Available at: http://www.childdeathreview.org/statisticsCT.htm.

CONNECTICUT DEPARTMENT OF SOCIAL SERVICES: DESCRIPTION OF MAJOR ASSISTANCE PROGRAMS

Food Stamps

The Food Stamp Program, designed to help households buy and eat nutritious foods, is paid for primarily via federal funding. Eligibility varies by household size and income, with maximum monthly benefits limited according to household size.

Temporary Family Assistance (TFA)

Temporary Family Assistance is an employment-focused assistance program for needy families consisting of at least one dependent child under age 18 and an adult relative caretaker. The program offers time-limited assistance (on a 21-month scale with possible extensions) for adults with the requirement that they actively seek/retain employment or education/training to obtain employment. Recipients must participate in the Employment Services portion of the program to receive full assistance. Families are eligible if their earned income does not exceed the federal poverty level, and they become ineligible if their earned income exceeds the federal poverty level (FLP).

State Supplement (For Aged, Blind and Disabled)

For individuals 65 and older (with other source of income, such as Social Security, Supplemental Security or Veteran's Benefit), who meet the Social Security Disability program, or the State Board of Education and Services for the Blind definition of being blind or are disabled according to the federal definition are entitled to state financial assistance. Eligible recipients' liquid assets cannot exceed $1,600 per person or $2,400 per couple. Recipients eligible for the state supplement are automatically eligible for Medicaid benefits.

Medicaid

The Medicaid program provides for remedial, preventive and long-term medical care for income-eligible aged, blind or disabled individuals, and families with children. The Connecticut Department of Social Services (DSS) makes direct payment to health care providers for services delivered to eligible individuals. The program complies with federal Medicaid law (Title XIX of the Social Security Act) and regulations so as to receive 50 percent reimbursement from the federal government.

State Administered General Assistance (SAGA)

This program provides cash or medical assistance for unemployable because of medical or other reasons, on shorter term individuals or families who do not meet "blood relative" requirements for TFA. "Employable" people are ineligible, unless they qualify for substance use assistance through the Connecticut Department of Mental Health and Addiction Services (DMHAS).[237]

CONNECTICUT AGE AND DISABILITY DEMOGRAPHICS BY HEALTH REFERENCE GROUP

TABLE 130: TOTAL CONNECTICUT POPULATION AGE 65 AND OLDER, BY HEALTH REFERENCE GROUP

AREA	Total Population 65+
HRG 1 (3)-UC	40,271
Bridgeport	16,012
Hartford	11,588
New Haven	12,671
HRG 2 (10)-MC	91,166
HRG 3 (15)-DS	91,891
HRG 4 (27)-WS	67,333
HRG 5 (39)-MT	103,284
HRG 6 (75)-RT	76,238
Connecticut	470,183

Used to determine eligible population for DSS State Supplement for Aged. Source: U.S. Census, 2000. Dataset: Census 2000 Summary File 1 (SF 1) 100-Percent Data, Table P12. Sex by age, Universe: Total population. Available online: www.census.gov.

TABLE 131: TOTAL CONNECTICUT NONINSTITUTIONALIZED POPULATION, AGE 16-64, CLAIMING EMPLOYMENT-RELATED DISABILITY BY HEALTH REFERENCE GROUP

AREA	Disabled Population
HRG 1 (3)-UC	39,404
Bridgeport	12,287
Hartford	13,564
New Haven	13,553
HRG 2 (10)-MC	47,302
HRG 3 (15)-DS	38,342
HRG 4 (27)-WS	26,959
HRG 5 (39)-MT	41,501
HRG 6 (75)-RT	33,669
Connecticut	227,177

Used to determine eligible population for DSS State Supplement for Disabled, Source: U.S. Census 2000, SF3: Table P125. Imputation of Employment Disability for the Civilian Noninstitutionalized Population 16 to 64 Years. Available at: www.census.gov.

TABLE 132: FAMILIES WITH RELATED CHILDREN UNDER 18 YEARS AND WITH INCOME BELOW POVERTY LEVEL

AREA	Families Below Poverty Level, 1999
HRG 1 (3)-UC	15,492
Bridgeport	4,411
Hartford	6,522
New Haven	4,559
HRG 2 (10)-MC	11,089
HRG 3 (15)-DS	5,176
HRG 4 (27)-WS	1,516
HRG 5 (39)-MT	3,779
HRG 6 (75)-RT	1,963
Connecticut	39,015

Source: U.S. Census 2000 Summary File 3 (SF3): Table P90.

TABLE 133: TOTAL POPULATION WITH INCOME BELOW POVERTY LEVEL

AREA	Total Below Poverty Level, 1999
HRG 1 (3)-UC	88,274
Bridgeport	24,920
Hartford	35,741
New Haven	27,613
HRG 2 (10)-MC	160,257
HRG 3 (15)-DS	37,133
HRG 4 (27)-WS	12,437
HRG 5 (39)-MT	31,271
HRG 6 (75)-RT	18,416
Connecticut	259,514

Used to determine eligible population for DSS Temporary Family Assistance "Recipients." Source: U.S. Census, 2000, SF3: Table P89. Poverty Status in 1999 By Age By Household – All Household Types.

APPENDIX F

EMERGENCY DEPARTMENT VISITS FOR CHILD AND ADULT ABUSE

TABLE 134: CHILD AND ADULT ABUSE (E CODE=E967). ANNUAL RATES OF EMERGENCY DEPARTMENT VISITS PER 1,000 RESIDENTS BY AGE AND GENDER. CONNECTICUT FISCAL YEAR 2002-2003

AGE GROUP	Gender	2000 Population	FY2002-2003 Emergency Department Visits	Annualized ED Visit Rate per 1,000 Residents
TOTAL		3,405,565	2,216	0.33
	Female Total	1,756,246	1,848	0.53
	Male Total	1,649,319	368	0.11
0-4	F	109,215	92	0.42
0-4	M	114,129	65	0.28
5-9	F	119,141	74	0.31
5-9	M	125,003	72	0.29
10-14	F	117,881	107	0.45
10-14	M	123,706	69	0.28
15-19	F	105,336	209	0.99
15-19	M	111,291	34	0.15
20-24	F	92,468	284	1.54
20-24	M	95,103	23	0.12
25-29	F	101,487	223	1.10
25-29	M	99,980	11	0.06
30-34	F	127,440	226	0.89
30-34	M	122,733	18	0.07
35-39	F	148,386	229	0.77
35-39	M	142,480	18	0.06
40-44	F	147,434	185	0.63
40-44	M	142,749	24	0.08
45-49	F	128,882	108	0.42
45-49	M	123,872	8	0.03
50-54	F	117,812	43	0.18
50-54	M	110,241	7	0.03
55-59	F	91,340	25	0.14
55-59	M	85,621	5	0.03
60-64	F	69,243	11	0.08
60-64	M	62,409	4	0.03
65-69	F	63,506	10	0.08
65-69	M	54,050	3	0.03
70-74	F	64,057	3	0.02
70-74	M	49,952	3	0.03
75-79	F	59,882	4	0.03
75-79	M	41,214	1	0.01
80-84	F	46,395	7	0.08
80-84	M	26,854	1	0.02
85+	F	46,341	8	0.09
85+	M	17,932	2	0.06

Source: CHIME Database, CHA.

TABLE 135: CHILD AND ADULT ABUSE (E CODE=E967). ANNUAL RATES OF EMERGENCY DEPARTMENT VISITS PER 1,000 RESIDENTS BY HRG. CONNECTICUT FISCAL YEAR 2002-2003. ADJUSTED FOR AGE AND GENDER.

AREA	2000 Population	Total ED Visits	Annual Crude ED Visit Rate	Annual Adjusted ED Visit Rate
TOTAL	3,405,565	2,216	0.33	0.34
HRG 1 (3)-UC	384,733	716	0.93	0.85
HRG 2 (10)-MC	662,398	555	0.42	0.42
HRG 3 (15)-DS	587,504	440	0.37	0.39
HRG 4 (27)-WS	487,620	74	0.08	0.09
HRG 5 (39)-MT	698,517	289	0.21	0.22
HRG 6 (75)-RT	584,793	142	0.12	0.13

Source: CHIME Database, CHA.

TABLE 136: CHILD ABUSE (E CODE=E967). ANNUAL RATES OF EMERGENCY DEPARTMENT VISITS PER 1,000 RESIDENTS BY HRG, AGE AND GENDER. CONNECTICUT FISCAL YEAR 2002-2003.

AGE GROUP	Gender	HRG	2000 Population	FY2002-2003 Emergency Department Visits	Annualized ED Visit Rate per 1,000 Residents
0-4	F	UC	14,753	39	1.32
0-4	F	DS	17,804	20	0.56
0-4	F	MC	22,258	18	0.40
0-4	F	MT	19,242	8	0.21
0-4	F	RT	17,899	4	0.11
0-4	F	WS	17,259	3	0.09
0-4	M	UC	15,509	29	0.93
0-4	M	DS	18,528	14	0.38
0-4	M	MC	23,188	12	0.26
0-4	M	MT	20,394	7	0.17
0-4	M	RT	18,467	2	0.05
0-4	M	WS	18,043	1	0.03
5-9	F	UC	15,356	36	1.17
5-9	F	MC	22,047	15	0.34
5-9	F	DS	18,901	10	0.26
5-9	F	MT	22,053	8	0.18
5-9	F	RT	20,958	4	0.10
5-9	F	WS	19,826	1	0.03
5-9	M	UC	15,930	33	1.04
5-9	M	MC	23,194	23	0.50
5-9	M	MT	23,027	11	0.24
5-9	M	DS	19,443	2	0.05
5-9	M	WS	21,076	2	0.05
5-9	M	RT	22,333	1	0.02
10-14	F	UC	14,306	50	1.75
10-14	F	MC	20,849	27	0.65
10-14	F	DS	18,917	13	0.34
10-14	F	MT	23,357	11	0.24
10-14	F	WS	18,457	4	0.11
10-14	F	RT	21,995	2	0.05
10-14	M	UC	15,141	35	1.16
10-14	M	DS	19,608	14	0.36
10-14	M	MC	21,465	11	0.26
10-14	M	MT	24,657	4	0.08
10-14	M	RT	23,167	3	0.06
10-14	M	WS	19,668	2	0.05

Source: CHIME Database, CHA.

Note: Sorted in descending order by HRG rate within age and gender category.

APPENDIX G

YOUTH SHELTERS OVERVIEW OF CONNECTICUT STATE YEARS (YOUTH EMERGENCY ASSESSMENT AND RESPITE SERVICES) AND OTHER YOUTH SHELTERS BY HEALTH REFERENCE GROUP

TABLE 137: YOUTH SHELTERS

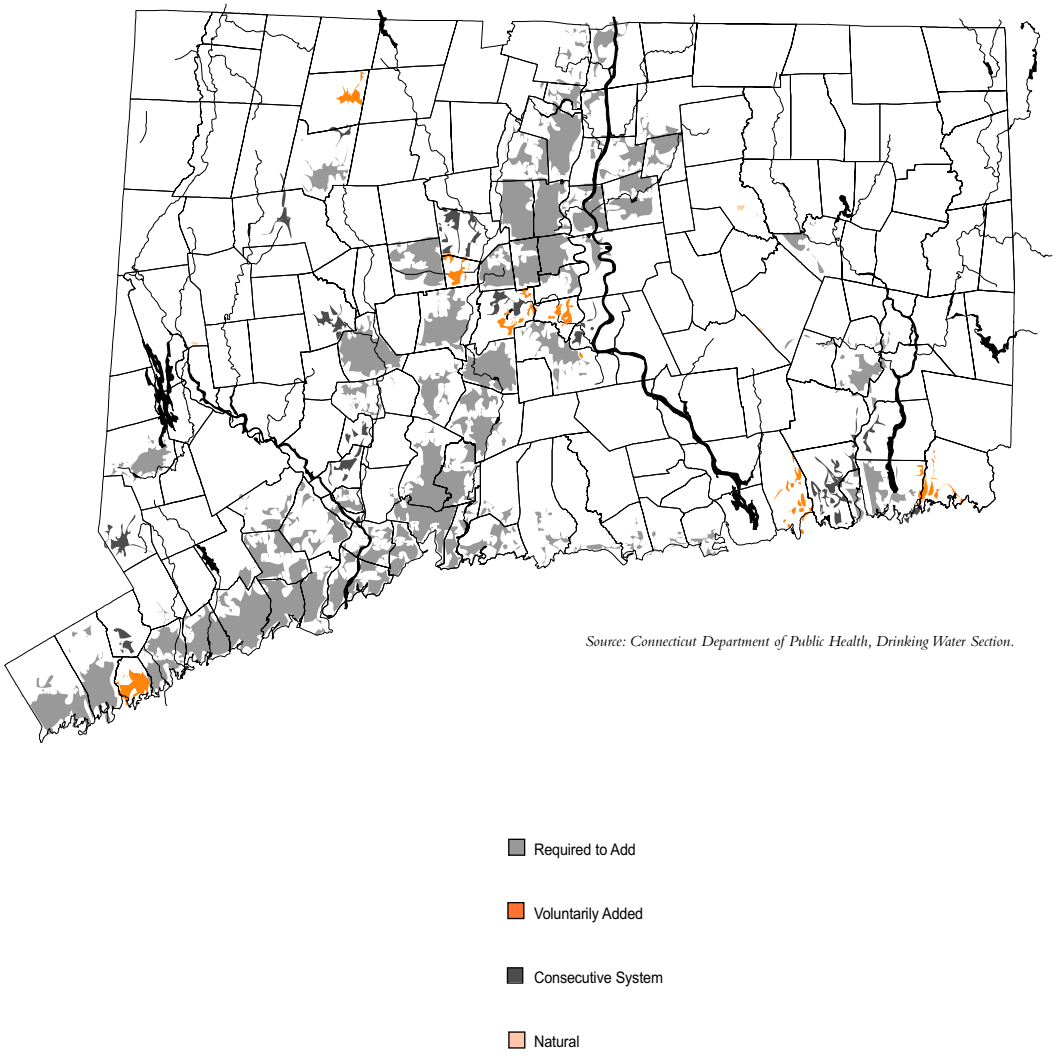
HRG	City/Town	Shelter	Total Licensed Beds	Age Range
UC	Hartford	The Salvation Army Marshall House	14	11-17
UC	Hartford	The YMCA – Jewell House	12	11-17
UC	Bridgeport	Council of Churches of Greater Bridgeport	(Not licensed YEARS shelter)	N/A
UC	Bridgeport	Janus House	12 (Not licensed YEARS shelter)	N/A
UC	New Haven	Douglas House	(Not licensed YEARS shelter)	N/A
UC	New Haven	Youth Continuum, Inc. www.kidscounsel.org/placement/index.6.html	(Not licensed YEARS shelter)	N/A
MC	Norwalk	Community Solutions, Inc. – The Norwalk Shelter	12	11-17
MC	Waterbury	The Salvation Army Youth Emergency Shelter	15	11-17
MC	Waterbury	Salvation Army Youth Shelter www.kidscounsel.org/placement/index.6.html	(Not licensed YEARS shelter)	N/A
DS	West Hartford	The Bridge Family Center	9	11-17
DS	Rockville	Community Solutions, Inc. – Kellogg House	8	11-17
WS	Cos Cob	Kids In Crisis, Inc. – Nursery and Adolescent Programs	16	0-17
MT	Quaker Hill	Waterford Country School – Thomas Bent and Rita Shelters	20	11-17
MT	Wauregan	Quinebaug Valley Youth & Family Services, Inc. www.kidscounsel.org/placement/index.6.html	(Not licensed YEARS shelter)	N/A
RT	Deep River	Mount Saint John, Inc. www.kidscounsel.org/placement/index.6.html	(Not licensed YEARS shelter)	N/A

Source: DCF YEARS: Youth Emergency Assessment and Respite Services (Emergency Youth Shelters) Statistical Report, Performance Based Contracting state fiscal year 2005 (July 1, 2004, to Sept. 30, 2004).

APPENDIX H

CONNECTICUT FLUORIDATED POPULATIONS

FIGURE 31: CONNECTICUT FLUORIDATED POPULATIONS, 2005



Source: Connecticut Department of Public Health, Drinking Water Section.

Appendix I

HEALTH CARE QUALITY INDICATORS

HEALTH CARE QUALITY

Health care quality can be categorized in two ways: functionally, such as preventive care, curative care and rehabilitative care; and by provider, such as physicians, primary care, hospitals, managed care, home health, and nursing homes. Functionally, a physician may deliver preventive care and also curative care. A physical therapist may provide preventive care and also rehabilitative care.

HOSPITAL-BASED PERFORMANCE INDICATORS

Connecticut Hospital Association (CHA) has a hospital performance reporting system comparing acute care providers on the following indicators:

- **Heart attack Acute Myocardial Infarction (AMI) care:** percentage of patients who receive aspirin at arrival; percentage of patients prescribed aspirin at discharge; Angiotensin-Converting Enzyme (ACE) inhibitor, Beta blocker at arrival and discharge.
- **Heart failure care:** percentage of patients who have a left ventricular function — LVF — assessment; percentage who receive an ACE inhibitor at discharge.
- **Pneumonia care:** percentage of patients who receive an oxygen assessment; percentage who are screened for and receive pneumonia vaccination as appropriate; percentage who receive an antibiotic within four hours of arrival.

These measures are available in six-month intervals for all Connecticut hospitals (except Sharon Hospital). They are available on CHA's web site at www.chime.org/Quality/HPR.html. No other quality data are available from CHA. In addition, these data are not available in any other format, e.g., by town or race/ethnicity of patient, although theoretically the data could be aggregated in this manner.

Many conditions do not — at least should not — lead to hospitalization. Certain conditions, e.g., hospitalization for diabetes complications and asthma, have been used as markers for the quality of primary care and disparities in primary care, since these problems should be treated and controlled in the primary care setting and not allowed to develop to the point that they require hospitalization. This is an important issue since avoidance of hospitalization is positive for both patients and payors. Treated preventively in the primary care setting, the patient remains in better health, and the cost is lower.

PRIMARY/AMBULATORY CARE

The state Office of Health Care Access (OHCA) issued a databook on preventable hospitalizations (ambulatory care sensitive conditions — ACSC) in Connecticut, including an extensive analysis of 16 target conditions, covering 2000-2004.[238] Table 137 shows results for fiscal year 2004.

TABLE 138: HOSPITALIZATION FOR SELECTED AMBULATORY CARE SENSITIVE CONDITIONS

ACSC AND AGE RANGE	Discharges, FY 2004
Bacterial Pneumonia – All	12,236
Congestive Heart Failure – 18+	11,048
Chronic Obstructive Pulmonary Disease – 18+	4,563
Urinary Tract Infection – All	4,278
Adult Asthma – 18+	3,002
Dehydration – All	4,176
Low Birth Weight – All Births	2,754
Diabetes Long-Term Complication – 18+	2,803
Diabetes Short-Term Complication – 18+	1,126
Diabetes Uncontrolled – 18+	196
Pediatric Asthma – <18	1,406
Lower Extremity Amputation – 18+	1,008
Perforated Appendix – Persons with Appendicitis	970
Angina – 18+	853
Pediatric Gastroenteritis – <18	486
Hypertension – 18+	654
Total	50,948

Source: Preventable Hospitalizations in Connecticut: Assessing Access to Community Health Services, FY 2000-2004, Databook. OHCA, 2005.

The table illustrates that a sizeable, expensive and health-threatening portion of all hospital discharges are potentially preventable, given accessible and timely ambulatory care. OHCA reports that the total volume of ACSC conditions rose 7.4 percent between fiscal years 2000 and 2004, and that the 50,948 discharges in 2004 were associated with total charges of almost $900 million.[239] Furthermore, "nearly two-thirds were hospitalized previously, most were admitted through the ED (80 percent) and nearly half required additional care after discharge (25 percent transferred to other facilities and 20 percent to home health services)." Blacks and Hispanics were more likely to be hospitalized for ACSCs, and accounted for more than half of the recent increase in ACSC hospitalizations.[240]

NURSING HOME QUALITY

Measures of nursing home quality are available from the Centers for Medicare & Medicaid Services (CMS) web site at www.medicare.gov.

There are two sources of nursing home quality data:

- CMS' Online Survey, Certification, and Reporting (OSCAR) database. Includes nursing home characteristics and health deficiencies issued during the three most recent state inspections and recent complaint investigations.
- The Minimum DataSet (MDS) Repository. The MDS is collected on regular intervals for every resident in a Medicare- or Medicaid-certified nursing home. Information is collected on the resident's health, physical functioning, mental status and general well-being.

MDS Quality Measures Based on Observation (Days in Parentheses)

Long-Term Measures

- Percentage of residents whose need for help with daily activities has increased (over past 7 days).
- Percentage of residents who have moderate to severe pain (7).
- Percentage of high-risk residents who have pressure sores (7).
- Percentage of low-risk residents who have pressure sores (7).
- Percentage of residents who were physically restrained (7).
- Percentage of residents who are more depressed or anxious (30).
- Percentage of low-risk residents who lose control of bowels or bladder (14).
- Percentage of residents who have/had a catheter inserted and left in their bladder (14).
- Percentage of residents who spent most of their time in bed or in a chair (7).
- Percentage of residents whose ability to move about in and around their room got worse (7).
- Percentage of residents with a urinary tract infection (30).
- Percentage of residents who lose too much weight (30).

Short-Stay Measures

- Percentage of short-stay residents with delirium (7).
- Percentage of short-stay residents who had moderate to severe pain (7).
- Percentage of short-stay residents with pressure sores (7).

HOME HEALTH QUALITY MEASURES

The home health quality measures come from information collected by Medicare and Medicaid-certified home health agencies available from the CMS web site at www.medicare.gov/HHCompare. They include:

Improvement in getting around

- Percentage of patients who get better at walking or moving around.
- Percentage of patients who get better at getting in and out of bed.
- Percentage of patients who get better at getting to and from the toilet.
- Percentage of patients who have less pain when moving around.

Patient's activities of daily living

- Percentage of patients who get better at bathing.
- Percentage of patients who get better at taking their medicines correctly (by mouth).
- Percentage of patients who get better at getting dressed.
- Percentage of patients who stay the same or don't get worse at bathing.

Patient medical emergencies

- Percentage of patients who had to be admitted to the hospital.
- Percentage of patients who need urgent, unplanned medical care.

Improvement in mental health

- Percentage of patients who are confused less often.

APPENDIX J

MAXIMUM CONTAMINANT LEVEL (MCL) VIOLATIONS

TABLE 139: MCL VIOLATIONS, 2004

CONTAMINANT	Number of MCL Violations[241]	Health Risks from prolonged exposure to high levels	Source
Total Coliform	334	No known health risks; used to indicate whether other harmful bacteria are present.[242]	Occurs naturally.
Total Coliform Acute (fecal coliform and E. coli)	23	E. coli can cause severe illness; abdominal cramps and bloody diarrhea; 2-7 percent of infections can cause kidney failure in elderly and children.[243]	Runoff from human and animal waste.
Nitrate	10	Can cause illness or death in infants under the age of six months; a syndrome known as "blue baby" with symptoms of shortness of breath.[244]	Runoff from fertilizers; septic tank leakage; sewage; or can occur naturally.
Gross Alpha	1	Indicates high levels of radioactive materials and requires further testing to identify the species.[245]	Occurs naturally in Connecticut bedrock.
Radium 226 & 228	12	Known human carcinogen.[246]	Occurs naturally in Connecticut bedrock and results from decay of uranium.
Uranium	16	Known human carcinogen.[247] Can affect the kidneys.[248]	Occurs naturally in Connecticut bedrock.
Dibromochloropropane (DBCP)	1	Probable human carcinogen/with sufficient evidence in animals but inadequate evidence in humans[249] and reproductive difficulties.[250]	Runoff from soil fumigant used on orchards.
Di (2-ethylhexylphthalat e)	1	Probable human carcinogen/with sufficient evidence in animals but inadequate evidence in humans[251] and reproductive difficulties and liver problems.[252]	Released from rubber and chemical manufacturing.
Antimony	1	Not a carcinogen.[253] Causes increase in blood cholesterol and decrease in blood sugar.[254]	Released from petroleum refineries, electronics, fire retardants, solder, and ceramics.
Dichloromethane	1	Suggestive evidence that it is a carcinogen but inadequate evidence in humans[255] and liver problems.[256]	Released from drug and chemical manufacturing.
Trichloroethylene	4	Probable human carcinogen/with sufficient evidence in animals but inadequate evidence in humans[257] and liver problems.[258]	Released from factories and metal degreasing sites.
Flouride	1	Could cause pain and tenderness in bones and mottled teeth in children.[259]	An additive to water; can also occur naturally or come from fertilizer and aluminum manufacturing.

Source: in table endnotes.

APPENDIX K

MORTALITY COUNT DETAILS

TABLE 140: AVERAGE MORTALITY COUNTS, FOR SPECIFIC DISEASES AND CONDITIONS WITH AT LEAST 200 AVERAGE DEATHS PER YEAR, 2000-2004

ICD 10 CODE AND CONDITION	Average Annual Deaths
Total, All Causes	29,733
C00-C97 Malignant neoplasms	7,087
C18-C21 Colorectal cancer	730
C25 Pancreatic cancer	420
C33-C34 Trachea, bronchus and lung	1,867
C50 Breast cancer	553
C61 Prostate cancer	398
C80 Cancer without specification	395
C82-C85 Non-Hodgkin's lymphoma	287
C91-C95 Leukemia	274
I00-I78 Major cardiovascular	11,090
I00-I09,I11,I13,I20-I51 Heart Disease	8,487
I10,I12 Essential hypertension	269
I11 Hypertensive heart disease	212
I20-I25 Ischemic heart disease	5,789
I50.0 Congestive heart failure	632
I60-I69 Cerebrovascular disease	1,864
I64 Stroke, not infarction	992
I71 Aortic aneurysm and dissection	205
E10-E14 Diabetes mellitus	708
V01-X59,Y85-Y86 Accidents (unintentional injuries)	1,139
X40-X49 Accidental poisoning & exposure to noxious substances	271
X60-X84,Y87.0,X85-Y09,Y87.1,Y35,Y89.0 Intentional Injuries	382
X60-X84,Y87.0 Suicide	279
Drug-induced deaths	342
F03 Unspecified dementia	590
G20-G21 Parkinsons's disease	214
G30 Alzheimer's disease	593
A40-A41 Septicemia	551
J10-J18 Pneumonia and Influenza	869
J12-J18 Pneumonia	855
J40-J47 Chronic lower respiratory diseases (COPD)	1,468
J69 Pneumonitis due to solids	359
K55 Vascular disorder of intestine	291
K70,K73-K74 Chronic liver disease and cirrhosis	309
N00-N07,N17-N19,N25-N27 Nephritis, nephrotic syndrome, nephrosis	304
N19 Unspecified renal failure	261

Source: Connecticut Department of Public Health (DPH) Supplemental Table 9 for 2000-2004, Accessed Oct. 12, 2006.

APPENDIX L

PRIORITY SETTING METHODS

POSSIBLE CRITERIA FOR PRIORITY-SETTING

A *Data Scan* should focus on several goals: (1) provide useful data for further reflection; (2) aid grant-seeking agencies; (3) help the funding agent and actors on the political scene to set priorities; and (4) help active citizens to better understand health, health risk and health care issues.

The purpose of a *Data Scan* is to provide a systematic and quantitative approach to health-related issues. But how can data be translated into priorities? There are several approaches:

(1) Focus on mortality

A common approach to the question of priority is to focus on mortality: For which conditions do the highest mortality rates exist? With this approach, one answer will always emerge: heart failure, since many elderly persons die of heart failure. This rate overwhelms all others. Clearly, very little guidance about prevention is provided by this fact.

(2) Focus on deaths before age 65 and years of potential life lost

A different approach is to ask two different questions: How many deaths occur before age 65? 75? Years of life lost before age 65 or 75 are called "years of potential life lost" (YPLL).[q] Somewhat different answers may emerge, depending upon whether the focus is on death, or YPLL. For example, for Connecticut in 2002, there were 6,413 deaths before age 65. Of these 1,866 (29.1 percent) were from malignant neoplasms; 1,226 (19.1 percent) were from heart disease; and 733 (11.4 percent) were from unintentional injuries. If we calculate YPLL (before age 65), malignant neoplasms account for 18.7 percent of all YPLL, heart disease for 13.0 percent, and unintentional injury for 18.4 percent.[260] Therefore, unintentional injury is a larger cause of YPLL than it is of death. Of course this occurs because unintentional injury is a relatively frequent cause of death for the young, and therefore accounts for many years of potential life lost.[261]

YPLL analysis is available for the United States and for Connecticut, and for certain gender and race/ethnicity specific groups through the federal government's WISQARS web site: webappa.cdc.gov/sasweb/ncipc/ypll.html. Since leading causes of death for the population under 65 are highly variable for different gender and race/ethnicity groups, this could be an important feature of the priority-setting analysis, particularly for one that is focused on understanding disparities.

(3) Focus on relative risk — excess or deficit in events

Another approach is to calculate an estimate of excess of events for persons of color versus whites. This approach has the advantage of putting the issue of disparities in numerical terms, without the complexity of the YPLL calculation, and it can apply to morbidity as well as mortality.

This approach will tend to give a lower estimate of health disparities than will the YPLL calculation, when applied to mortality. This occurs because the excess events method does not consider the number of years of life lost by those who die, only the death numbers in the selected populations — and black and Hispanic persons tend to die at an earlier age than whites. Therefore the excess years of life lost by black and Hispanic persons, who tend to die at an earlier age, may not be considered.

(4) Focus on morbidity

Focusing on morbidity (disease rather than death) is another possible approach, although weighing different kinds of morbidity is difficult. For example, how does one weight the impact of diagnosis and ongoing treatment for HIV/AIDS against diagnosis and treatment for diabetes, or against nonfatal injuries from intentional knife or gunshot wounds? What about inherited conditions, such as Huntington's Chorea, which are serious and always lead to early death and significant decline in quality of life before death, but which have no known cures? Should such diseases "count" in setting priorities for health care policy?

(5) Focus on preventable disease conditions

A still different approach is to focus on conditions that have known causes and preventive methods. This approach has the advantage of putting resources where they might make a large difference, e.g., smoking relative to preventing lung cancer; oral screening and dental sealant application relative to preventing dental caries; diet and exercise relative to type 2 diabetes.

(6) Use the "common ground" approach

The preceding approaches take a disease-specific or categorical perspective. An alternative is to find a "common ground" where a single intervention or behavior change might result in multiple positive health outcomes. Three examples include: (a) ridding schools of "junk food" vending machines to attack root causes of obesity and poor oral health by removing highly refined high-sugar foods and drinks; (b) providing more adult-sponsored out-of-school programs that may have an impact in many areas of youth behavior, reducing youth violence and teen pregnancy and reducing youth obesity and early onset of diabetes by increasing physical activity; and (c) focusing on medical errors, creating across-the-board medical system improvements that reduce hospital-related infection and death.

(7) Focus in areas where success can be measured and attributed to intervention

This is a difficult criterion to meet because it involves two logical steps, both of which much be satisfied: (a) did the health condition improve, and (b) can that improvement be attributed to specific policies or interventions. Even the first part of this — whether the health condition improved — may be difficult to demonstrate in anything but a long-term sense. Each of these measures in the causal sequence may have a long cycle time between developing a baseline measure, making a change, collecting data about the change, and analyzing and reporting data about the change.

APPENDIX M

MENTAL HEALTH

INTRODUCTION

The U.S. Center for Mental Health Services (CMHS) Uniform Reporting System (URS) contains data relevant to several problems, including that of repeat psychiatric hospitalization and residential treatment. "The URS data tables are available beginning with the year 2002. Repeat admissions refers to repeat admissions to Riverview Hospital located in Middletown. The definition of children's Residential Treatment Facility is as follows: Children and Youth Residential Treatment Facilities (RTF's) provide fully integrated mental health treatment services to seriously emotionally disturbed children and youth. An organization, not licensed as a psychiatric hospital, whose primary purpose is the provision of individually planned programs of mental health treatment services in conjunction with residential care for children and youth. The services are provided in facilities that are certified by state or federal agencies or through a national accrediting agency. Children are placed in a specific facility based on presenting issues and expertise of provider as well as availability."[262]

Child mental health data are produced by the Connecticut Department of Children and Families. These data are transmitted to the Connecticut Department of Mental Health and Addiction Services and then submitted by them to CMHS for use in the URS tables.

Based on previous critical analyses of child mental health care in Connecticut, the state instituted KidCare with the aim of improving the coordination of care through the development of "Community Collaboratives."[263] See www.cthealth.org for additional data. There is keen interest in documenting whether this has led to changes in (1) the rate of out-of-state placements, (2) repeated hospitalizations of children and (3) hospitalizations with long stays.

OUT-OF-STATE PLACEMENTS

There are not, to this point, publicly available and reliable data on out-of-state placement rates.

REPEATED PSYCHIATRIC HOSPITALIZATION

The number of repeat hospitalizations is shown in Table 141.

TABLE 141: PERCENTAGE OF PATIENTS WITH REPEAT STATE PSYCHIATRIC HOSPITAL ADMISSIONS, WITHIN 180 DAYS

AGE	2002	2003	2004	2005
0-12	NA	-	4.7%	8.3% (60)
13-17	NA	-	9.5%	5.4% (167)
18-20	NA	22.1	3.3%	22.1% (104)

Source: http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2002.asp. Accessed Jan. 23, 2007;
http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2003.asp. Accessed Jan. 23, 2007;
http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2004.asp. Accessed Jan. 23, 2007;
http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2005.asp. Accessed Jan. 23, 2007.
Data note: Base denominator number of discharges provided for 2005.

The percentages are based on very small numbers, lack data documentation, are subject to changes in definition, and are, therefore, of limited reliability. They should be examined from the perspective that the system should be capable of producing reliable statistics, rather than that these reflect any reliable trends in themselves.

TREATMENT LENGTH OF STAY

Data exist for average length of stay and are presented in Table 142.

TABLE 142: AVERAGE LENGTH OF STAY IN DAYS FOR CHILDREN IN CONNECTICUT PSYCHIATRIC FACILITIES

		2002	2003	2004	2005
Average LOS, State Hospital	Discharged Clients	205	166	172	157 (123)
	Resident Clients	151	302	171	136 (93)
Average LOS, Residential Treatment Centers for Children	Discharged Clients	NA	342	256	206 (132)
	Resident Clients	NA	357	250	227 (178)

Source: http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2002.asp. Accessed Jan. 23, 2007; http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2003.asp. Accessed Jan. 23, 2007; http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2004.asp. Accessed Jan. 23, 2007; http://mentalhealth.samhsa.gov/cmhs/MentalHealthStatistics/URS2005.asp. Accessed Jan. 23, 2007. Data note: median length of stay provided for 2005. This is a better measure than average length of stay.

These data suggest that the average length of stay in residential treatment settings has declined in the past three years. It is not clear what has contributed to this decline. One problem is that the data submitted and available online does not contain the documentation (meta-data) that would allow a user to understand the changes in reporting specifications so as to properly interpret the data. This problem is discussed further in the Data Recommendations section of Chapter 11, Summary and Recommendations.

The mental health data system remains problematic despite efforts to improve it and to implement the CMHS Uniform Reporting System (URS) dataset and standards. There is a fragmentation of data reporting, lack of online data capability to access more detailed state data, and a lack of readily accessible information about data definitions in use in the agencies.

Outside analysts cannot generate carefully defined data requests to the appropriate state agencies without the backup documentation that would make such specific requests possible or meaningful. For example, while data dictionaries and "pick lists" exist for some data, there does not exist any publicly available documentation relating the data to specific program delivery modes and changes in those modes. There is neither documentation on data quality nor on basic "numbers" that would permit planful requests.

Recommendation

Support an effort to develop better organization of data and meta-data about the mental health data in Connecticut. Make data and meta-data available online to promote an educated citizenry in this important area.

ACRONYMS, ENDNOTES AND REFERENCE NOTES

ACRONYMS

ACSC	ambulatory care sensitive conditions
AHRQ	Agency for Healthcare Research and Quality (federal agency)
AIDS	acquired immune deficiency syndrome
AJPH	American Journal of Public Health
AQI	Air Quality Index
BMI	Body Mass Index
BRFSS	Behavioral Risk Factor Surveillance System
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CAPT	Connecticut Academic Performance Test
CDC	Centers for Disease Control and Prevention (federal agency)
DPH	Department of Public Health (Connecticut state agency)
CHA	Connecticut Hospital Association
CHF	Connecticut Health Foundation
CHIERS	Connecticut Health Information and Electronic Reporting System
CHIME	Connecticut Health Information Management and Exchange
CMHS	Center for Mental Health Services (federal agency)
CMIC	Connecticut Medical Insurance Company
CMS	Centers for Medicare and Medicaid Services (federal agency)
ConnPACE	Connecticut Department of Social Services Pharmaceutical Assistance Contract to the Elderly and Disabled
CVD	cardiovascular disease
DCF	Department of Children and Families (Connecticut state agency)
DEP	Department of Environmental Protection (Connecticut state agency)
DHHS	Department of Health and Human Services (federal agency)
DMHAS	Department of Mental Health and Addiction Services (Connecticut state agency)
DOA	Department of Agriculture (Connecticut state agency)
DOL	Department of Labor (Connecticut state agency)
DOT	Department of Transportation (Connecticut state agency)
DS	diverse suburb(s)
DSS	Department of Social Services (Connecticut state agency)
DWS	Drinking Water Section (of the Connecticut Department of Public Health)
ED	emergency department
EMSR	emergency medical services region
EPA	Environmental Protection Agency (federal agency)
EPSDT	Early and Periodic Screening, Diagnosis, and Treatment
ERG	Education Reference Group
ETS	environmental tobacco smoke
FPL	federal poverty level
HEDIS®	Health Plan Employer Data and Information Set
HIV	human immunodeficiency virus
HMO	health maintenance organization
HRG	Health Reference Group
HUSKY	Healthcare for UninSured Kids and Youth
IDU	intravenous drug use
IOM	Institute of Medicine (of the National Academies)
JAMA	Journal of the American Medical Association

LBW	low birth weight
Mass-CHIP	Massachusetts Community Health Information Profile
MCHB	Maternal and Child Health Bureau (federal agency)
MC	manufacturing center(s)
MCL	maximum contaminant level
MDS	minimum dataset (for CMS)
MSM	men who have sex with men
MT	mill town(s)
NAAQS	National Ambient Air Quality Standards
NCES	National Center for Education Statistics
NCQA	National Committee for Quality Assurance
NEJM	New England Journal of Medicine
NHANES	National Health and Nutrition Examination Survey
NQF	National Quality Forum
NRI	National Association of State Mental Health Program Directors Research Institute, Inc.
OASIS	Outcome and Assessment Information Set
OHCA	Office of Healthcare Access (Connecticut state agency)
OMB	Office of Management and Budget (federal agency)
OSCAR	Online Survey, Certification, and Reporting (for CMS)
PDF	portable document format
PWS	public water supply
QALYs	quality-adjusted life-years
QuIC	Quality Interagency Coordination Task Force (federal agency)
RT	rural town(s)
RTF	residential treatment facilities
SAGA	State-Administered General Assistance
SDE	Connecticut State Department of Education (Connecticut state agency)
SFY	state fiscal year
SIDS	Sudden Infant Death Syndrome
SMSA	standard metropolitan statistical area
STD	sexually transmitted disease
TFA	Temporary Family Assistance
UC	urban center(s)
URS	Uniform Reporting System
USR	uniform service region
VCHB	Virtual Children's Health Bureau (Connecticut state agency)
VLBW	very low birth weight
WISQARS	Web-based Injury Statistics Query and Reporting System (via the CDC web site)
WS	wealthy suburb(s)
YEARS	Youth Emergency Assessment and Respite Services
YPLL	years of potential life lost
YRBS	Youth Risk Behavior Survey

ENDNOTES

a A similar strategy has been suggested in the work of Nancy Krieger in the Public Health Disparities Geocoding Project. It encourages the use of socioeconomic strata as a way to identify potential health risks — referred to as "context effects" — that may useful in monitoring patterns of health disparities. Krieger recommends using a census tract level of analysis and the "percent of persons below poverty" as a key indicator. A description of the project can be found at: http://www.hsph.harvard.edu/thegeocodingproject/.

b Discussion of the historical geography of Health Reference Groups (HRGs) was developed by Thomas J. Cooke, Ph.D., Associate Professor, Department of Geography; and Coordinator, Urban and Community Studies Program, University of Connecticut, Storrs. Additional detail is available in Appendix B.

c Note that this "healthy immigrant effect"may dissipate with time. Immigrants, particularly black and Hispanic residents, tend to have higher mortality rates as they acculturate to U.S. patterns. In the case of Hispanics, this pattern is known as the "Latino Paradox" and is discussed in Chapter 9, Health Outcomes: Health Status, Disease Incidence, Hospitalization, and Mortality.

d See for example: Ellis Y. Clustering of Twenty-Eight Sample Areas in the Ethnographic Evaluation of the Behavioral Causes of Census Undercount for the 1990 Decennial Census (1995). Available at: http://www.census.gov/srd/www/byyear.html. Accessed June 1, 2006. Updated Feb. 6, 2007.

e There are some serious low-incidence infectious diseases, such as tuberculosis (TB), that are more prevalent in certain immigrant populations. Recent state and Centers for Disease Control and Prevention (CDC) reports show that a majority of new TB cases are found in foreign-born individuals. These reports suggest greater case-finding efforts in immigrant communities. Available at: http://www.cdc.gov/nchstp/tb/notes/TBN_2_06/changingepidemiology.htm.

f Because of limitations in U.S. Census 2000 reporting, some detailed tables, such as the median age tables, give white alone values that include persons who identify as of Hispanic ethnicity and white alone race, and similarly, Hispanic ethnicity and black-alone race or Hispanic ethnicity and Asian-alone race. Tables are provided by the U.S. Census Bureau for white alone race, non-Hispanic, but not for black-alone race, non-Hispanic ethnicity or for Asian-alone race, non-Hispanic ethnicity.

g A caution in analyzing both Hispanic and Asian subgroup rates is that the U.S. Census 2000 population values used as denominators may be deficient in three important respects: (1) Since these groups appear to be increasing in numbers, using their 1999-2003 birth-count numbers as numerators but dividing by year 2000 population denominators may slightly bias them to a high rate. (2) New, possibly undocumented, immigrants may avoid the census process yet claim their race/ethnicity status on the birth certificate, resulting in denominators too small relative to numerators, leading to inflated birth rates. (3) The numerator data may be deficient to the extent that some of the reporting of births may be to major groups only (e.g., Hispanic or Asian) and not to subgroups (e.g., Puerto Rican or Chinese). These problems could explain differences in group-specific birth rates, but not the differences in age-patterning of birth rates.

h Recent controversies over Boy Scouts because of policies regarding gay Scouts may have had an effect on recruitment and retention of Scouts and leaders. To the extent that other clubs have not made up this shortfall, it means a net decrease in youth participation in adult-sponsored activity.

i The nationwide median percentage is the median of all state prevalence estimates for a particular category, which are not age-adjusted, but which are weighted to the state's population. Avaliable at: http://www.cdc.gov/brfss/technical_infodata/weighting.htm for more weighting information. Source: Michele Sussman Walsh, Certified Health Education Specialist (CHES) Technical Writer/Communication Specialist, Northrop Grumman Contractor, Behavioral Surveillance Branch, Division of Adult and Community Health, Centers for Disease Control and Prevention (CDC). E-mail communication, Jan. 13, 2006.

j In at least one other state (Massachusetts) the "check-up" item has been dropped from the Behavioral Risk Fact Surveillance Survey (BRFSS) survey due to the possibly ambiguous wording or interpretation of the item (Karen Clements, Massachusetts Department of Public Health, personal communication, September 2005).

k One recent analyst has stated that "after adjustment, Hispanic [mortality] advantage is minor." See Arias E (Mortality Statistics Branch, Division of Vital Statistics, National Center for Health Statistics, CDC). Race and Hispanic origin, reporting on death certificates: Evaluation and applications. Presentation to NCHS Data Users Conference, July 10-12, 2006, Washington, DC.

l Massachusetts (MassCHIP): http://masschip.state.ma.us Illinois (IPLAN); http://app.idph.state.il.us/Resources/IPLANProcess.asp?menu=3 Utah (IBS-PH); http://ibis.health.utah.gov/home/welcome.html South Carolina (SCANDHEC); http://scangis.dhec.sc.gov/scan Tennessee (HIT); http://hit.state.tn.us Washington State (VISTA); http://www.doh.wa.gov/EHSPHL/CHS/Vista/default.htm New York State; http://www.health.state.ny.us/statistics/chip/index.htm Texas (TALHO); http://www.dshs.state.tx.us/chs/talho/talho.shtm. Missouri (MICA): http://www.dhss.mo.gov/MICA/.

m "The Connecticut Department of Public Health (DPH) began a pilot project to adapt the Missouri MICA system for Connecticut health data late in 2005. The Connecticut MICA-derived system is being called 'CHIERS,' the Connecticut Health Information and Electronic Reporting System. The collaborative participation of staff from several program areas, coordinated though the DPH Virtual Child Health Branch (VCHB), has allowed DPH to pilot test a few database modules." (Mueller L, DPH. E-mail communication. June 12, 2006.)

n "DPH is working with staff at UConn to develop detailed town-level annual population estimates for 2001 forward. DPH expects to begin releasing this information by the Fall of 2007. The future annual production of these detailed estimates will be contingent upon the availability of federal grant funds." (Mueller L, DPH. E-mail communication, Feb. 13, 2007).

o See *American Journal of Public Health*, 2000;90(11), for several articles on health differences discovered through use of more detailed race and ethnicity classification, including health risks of biracial individuals.

p This simplification assumes that there is no systematic difference in the population size of census tracts by race/ethnicity. Differences are small: A median split of census tracts relative to the white non-Hispanic percentage of the population indicates that those tracts that have 89.1 percent and below white non-Hispanic percentage have an average population size of 3,932. census tracts with more than 89.1 percent white non-Hispanic population have an average population size of 4,435. Therefore, white residents live in slightly more populated census tracts than all others do. This does not imply that they live in more densely populated areas; they do not.

q Years of potential life lost (YPLL) may also be defined as years of life lost before age 75 or 85. The point is to base decision making not on counts of lives lost, but on years of life lost. This approach assumes that equity demands a focus on years of life lost not simply on persons. More complex analyses focus on "Quality-adjusted life-years" (QALYs) that typically assume that the years immediately preceding death may be of lower quality, compromised by disease states. These are complex value judgments. Standard federal web site reports do not use the concept of QALYs.

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ABOUT THE CONNECTICUT HEALTH FOUNDATION (CHF)

The Connecticut Health Foundation (CHF), which was established in July of 1999, is the state's largest independent, non-profit grantmaking foundation dedicated to improving the health of the people of Connecticut through systemic change and program innovation.

After meeting with state agencies, community leaders and health care professionals, the foundation selected three program areas to focus its resources:

- Improving Access to Children's Mental Health Services
- Reducing Racial and Ethnic Health Disparities
- Expanding Access to and Utilization of Oral Health Services

Aside from directly supporting community-based and institutional grant proposals, CHF fosters discussions surrounding public health issues by convening meetings, conferences, educational briefings, grantee technical assistance workshops, etc.

The foundation also invests resources into conducting objective, nonpartisan policy research on issues important to the public health care debate, such as the state budget spending cap, the state's Medicaid system, and expanding oral health care for publicly-insured children throughout the state.

The foundation was created when health maintenance organization, ConnectiCare, Inc., converted to a for-profit entity. Under an agreement approved by the Connecticut Attorney General, CHF received 100 percent of the equity in ConnectiCare, thereby, creating the Connecticut Health Foundation. The foundation became officially endowed in June 2001, upon approval of the sale of its shares to private investors, which resulted in an initial endowment of $132 million.

The foundation's 15-member board of directors made a commitment to examine the underlying causes of barriers to health care among the unserved and underserved by directing 5 percent of its endowment toward grant making operations each year.

For more information about CHF, please click onto www.cthealth.org, or contact Maryland Grier, Public Affairs Officer, at 860.224.2200 or Maryland@cthealth.org.

Additional detailed data illustrated in a series of charts, maps, tables and notes is available on the Connecticut Health Foundation's website, www.cthealth.org. Data on a new web page, which will also feature electronic copies of the *Community Health Data Scan for Connecticut* and a four-page executive summary, will be updated periodically. To be notified of data updates via email, please send your contact information to databriefing@cthealth.org.

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