WORKING TOGETHER TO ASSURE A HEALTHY PUBLIC

The State of New Hampshire's Health
- A Report to New Hampshire Residents -

New Hampshire Department of Health and Human Services
Division of Public Health Services

John H. Lynch, Governor

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STATE OF NEW HAMPSHIRE

DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Dear Resident:

The stated purpose of the New Hampshire Department of Health and Human Services (DHHS) is to improve society by keeping New Hampshire healthy and helping those in need reach their full potential. Within DHHS, the Division of Public Health Services is tasked with assuring the health of the citizens of New Hampshire through core public health activities. One core public health activity is to monitor health status to identify and solve community health problems. To that end, I am pleased to introduce the *New Hampshire State Health Report*.

The *New Hampshire State Health Report* is a comprehensive document that provides information on the health status of the citizens of New Hampshire. The data and analysis are provided with the intent to demonstrate and celebrate the health status of our residents, with an ever-vigilant eye to any gaps that may exist. Moreover, the purpose of this report is to increase awareness of a variety of health topics in New Hampshire and serve as a tool to guide decision making for policymakers, health care providers, public health workers, practitioners, educators, and social service agencies.

As the first comprehensive look at the status of the public's health in New Hampshire since the Healthy New Hampshire 2010 report published in March 2001, the *New Hampshire State Health Report* provides valuable insights into the health of New Hampshire's citizens. This report looks at health from an over arching perspective of what influences individual and community health. This approach redirects the reader from looking solely at the result of disease, to focus on the potential for improving health.

For more information, please contact the Department of Health and Human Services, Division of Public Health Services, Bureau of Disease Control and Health Statistics, Health Statistics and Data Management Section at (603) 271-4988.

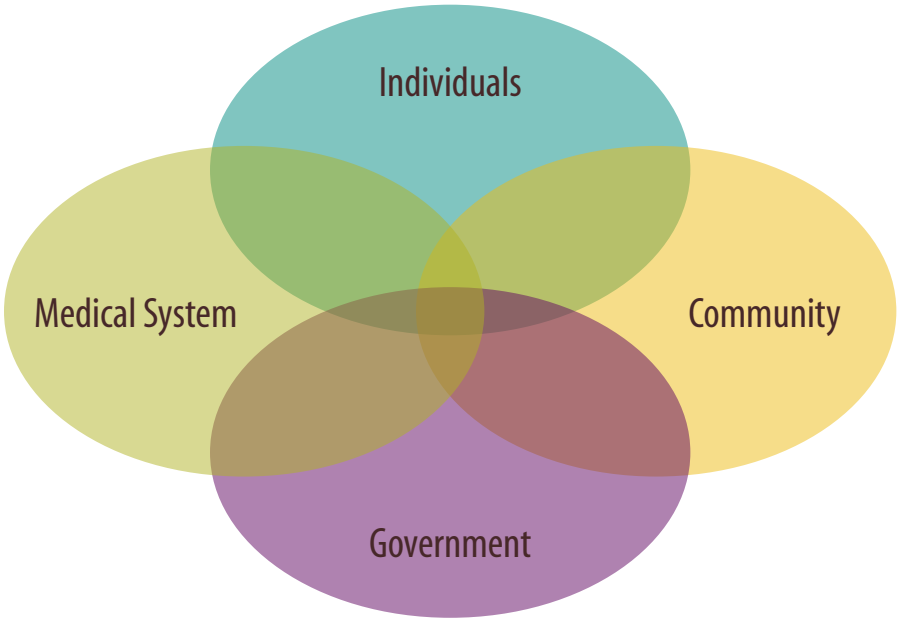
Sincerely,

John A. Stephen
Commissioner

Mary Ann Cooney, RN, MS
Director
Division of Public Health Services

INTRODUCTION

Individuals, local medical systems, communities and government must work together to create a healthy New Hampshire public.



The Intersectoral Public Health System

(Institute of Medicine, 2001 [1])

Working Together to Assure a Healthy Public is the first effort by the New Hampshire Department of Health and Human Services (DHHS) to provide New Hampshire residents a comprehensive summary of the health of the state's population. The specific aim of this report is to

- describe the current health of New Hampshire's population;
- summarize potential risks to the population's future health; and
- provide information to support collaboration among individuals, communities, the medical system and public health to assure the future health of the state's population.

We are living in a time of abundant health in which serious illness and premature death are relatively rare events for the majority of Americans under the age of 75 years [2]. On measures of health, prosperity and quality of life, New Hampshire has many reasons to be proud.

New Hampshire is a healthy state. This year, according to one national poll, New Hampshire was ranked the second most healthy state in the nation for the second year in a row [3]. Most New Hampshire residents, when asked, report that their health is good, very good or excellent. The average life expectancy of New Hampshire residents was 78.5 years in 2002 [4] compared to the national average life expectancy of 77.3 years [5].

New Hampshire is a prosperous state. Economic factors most likely associated with the health of the state's public include New Hampshire's: (a) high per capita income (third highest in New England and sixth highest in the nation, 2006) [6], (b) low unemployment rate (3.7% N.H. versus 4.6% U.S., 2006) [7], and (c) low poverty rate (5.7% N.H. versus 12.4% U.S., 2004) [8].

Quality of life in New Hampshire is good. In 2006, New Hampshire was ranked the most "livable" state in the nation for the third year in a row [9]. New Hampshire is a state that people move to for several reasons including its pristine natural environment, solid economy, and low crime rate.

However, for some New Hampshire residents, the state has not yet met its potential for population health. Although most New Hampshire residents are healthy and live relatively comfortable lives, the current health and well-being of some New Hampshire residents is not as good as it could be. Some residents are disabled by chronic disease, some lack health insurance, some live in poverty, and some die prematurely from preventable conditions. Additionally, many residents engage in unhealthy life-style behaviors—behaviors that may be linked to chronic diseases, injury and premature death.

Additionally, as New Hampshire plans for the future, the state must consider the new challenges that will confront public health—challenges associated with the changing times. For example, an increase in chronic diseases globally will challenge our public health and medical systems to treat and care for more people who live longer but who may be compromised by these conditions. There will also continue to be a need for public health to identify, treat and protect us from infectious diseases, and multi-drug resistance pathogens will complicate treatment of these diseases. Sadly, future challenges to public health also include the increased national concern over acts of terrorism and the state's need to prepare its public health system to address both natural, as well as, terrorist-related crises.

Assuring the health of New Hampshire's public now and in the future will require the investment of human and financial capital. As the state works to build a stronger public health infrastructure, it will need to take into account the assets and expertise that individuals, local medical systems, communities and government bring to the table. In its recent report, the Institute of Medicine (IOM) makes a clear statement that collaboration between government and public private entities is critical for assuring the future health of the public [1]. Thus, the work of public health is everyone's work as defined by "what we as a society do collectively to assure the conditions in which people can be healthy" [10].

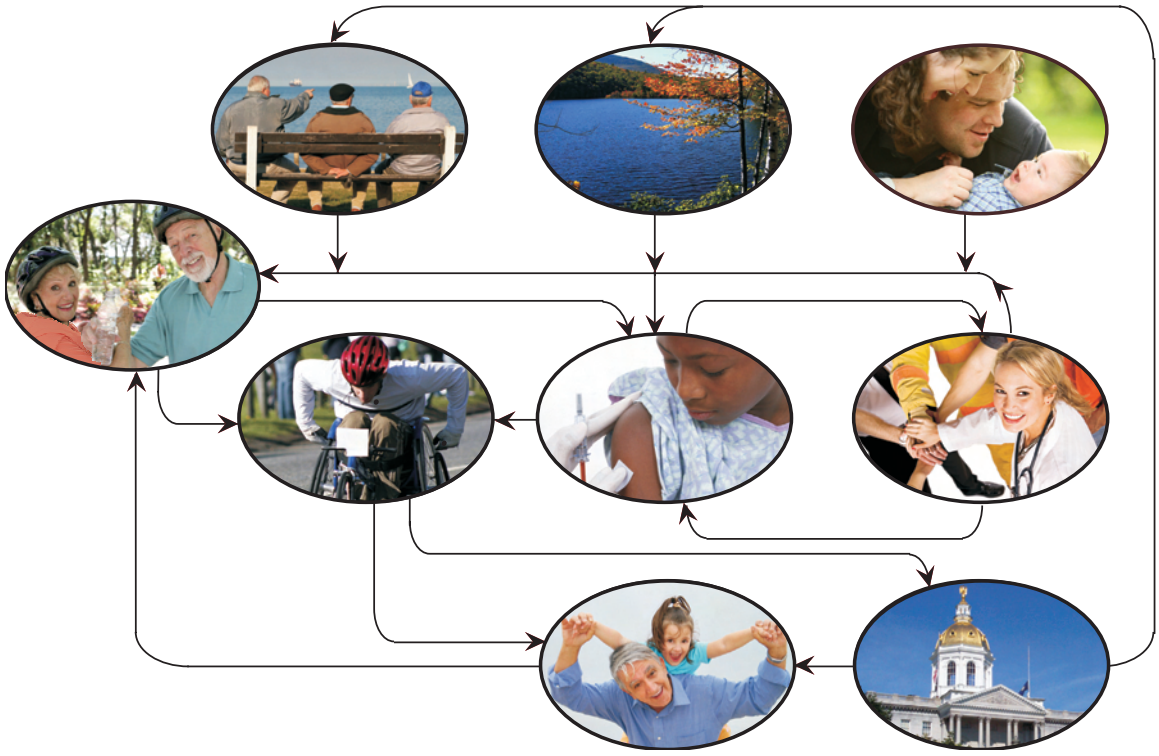
This report provides data that suggests that public health is everyone's business. Improving the current health of the public, decreasing risks to future health and protecting the public from any future health crises is a big job, one that we all must invest in.

This report was produced under contract for the New Hampshire Department of Health and Human Services (DHHS). It is meant to be an overview of the important health issues facing our New Hampshire residents. In order to simplify the presentation, information about data uncertainty (in the form of confidence intervals) is not included. We believe this report provides an excellent starting point for discussion about the public health needs of New Hampshire residents. DHHS recommends that public health officials and concerned New Hampshire residents having questions, obtain more information by consultation with specific program directors at DHHS or with the Health Statistics and Data Management Section at (603) 271-4988.

FRAMEWORK

Health is the outcome of a mix of several factors that interact at the individual, community, and societal level.

Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

HOW TO READ THIS REPORT

To develop this report we used available public health and state data from numerous sources. We defined health broadly based on a conventional model of factors that are known to determine or influence the health of individuals and populations.

Broad Definition of Health

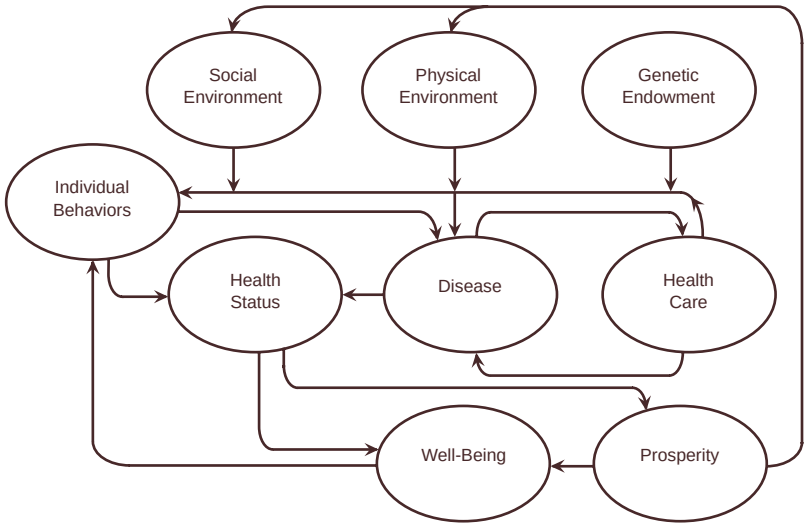
The definition of health used to frame this report was proposed by the Institute of Medicine [10]. In this definition, health is defined as "a state of well-being and the capacity to function in the face of changing circumstances".

This definition of health implies that "health" is the outcome of a mix of several factors that interact at the individual, community, and societal level. Also, "health" encompasses both the concept of "well-being" (health defined by the individual) as well as the concept of "absence of illness and disease" (health defined by the medical system).

A Model of Health Determinants

We used the Evans & Stoddard Field Model of Health and Well-Being [2] to describe New Hampshire's data. Using this model, we summarized key data indicators by the following domains of health: Health Status, Disease, Individual Behaviors, Social and Physical Environments, Prosperity, Health Care and Well-Being*.

Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

*Data summarizing Genetic Endowment is not presented in this report.

A simple way to understand the field model is to first think about the major health outcomes that we want to maintain or improve in the long-term; our "measures of success". These outcomes are summarized by the domains of Health Status, Disease, and Well-Being. Currently, individuals, communities, public health and the medical system are working together to

- prevent disease and injury,
- improve health as perceived by the individual, and
- enhance the sense of life satisfaction and well-being of the public.

Next, think about the domains that influence these outcomes: our Behaviors, the Social and Physical Environment in which we live and work, Prosperity and the Health Care System. It is in the realm of these domains and their interaction with our outcomes of interest where public health, communities, individuals and the medical system effect change in order to improve the health of the public.

Major Sources of Data

Numerous data sources and reports were utilized to develop this report. The Bureau of Disease Control and Health Statistics of the New Hampshire Department of Health and Human Services (DHHS) summarized several key data sets that provided the foundation of this health summary:

- Behavioral Risk Factor Surveillance System (BRFSS): a population-based, random, digit-dialed telephone survey of civilian, non-institutionalized adults, aged 18 years and older, conducted by the health departments of all 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam with assistance from the Centers for Disease Control and Prevention.
- Inpatient Hospital Discharge Data: data on all New Hampshire hospitalizations are abstracted from medical records upon patient discharge and reported to the DHHS.
- Outpatient Hospital Discharge Data: the outpatient data set contains discharge records for hospital emergency department visits, observation stays in the emergency department after illness or injury, and hospital visits for scheduled ambulatory surgeries.
- Mortality: New Hampshire law requires that reports of all deaths be filed with the Office of the State Registrar at the New Hampshire Department of State, Division of Vital Records Administration. Mortality data in this report refers to the underlying cause of death, which is the specific disease, condition, or injury that initiated the chain of events leading to death.
- U.S. Census: national population counts and estimates.
- Youth Risk Behavior Survey (YRBS): a national school-based survey conducted by the Centers for Disease Control and Prevention and by state and local education and health agencies.

Healthy New Hampshire 2010 Indicators

Healthy New Hampshire 2010 [11] is a document that outlines objectives for health care providers and consumers to use when establishing a framework for healthy living in New Hampshire. Several of these indicators have been updated in this report to reflect the most recent data available to the state.

We have used the Healthy New Hampshire 2010 icon throughout this document to draw your attention to these important benchmarks and have used a color coding system to help you "see" how New Hampshire is fairing in these health topic areas.

In all the tables in which the 2010 icon is depicted

- Red indicates that New Hampshire is not meeting its health goals for this indicator.
- Yellow indicates that the population's health is getting better in this area, but there is still room for improvement.
- Green is used to highlight indicators in which the state has met its planning goals or has exceeded the benchmark used for comparison.

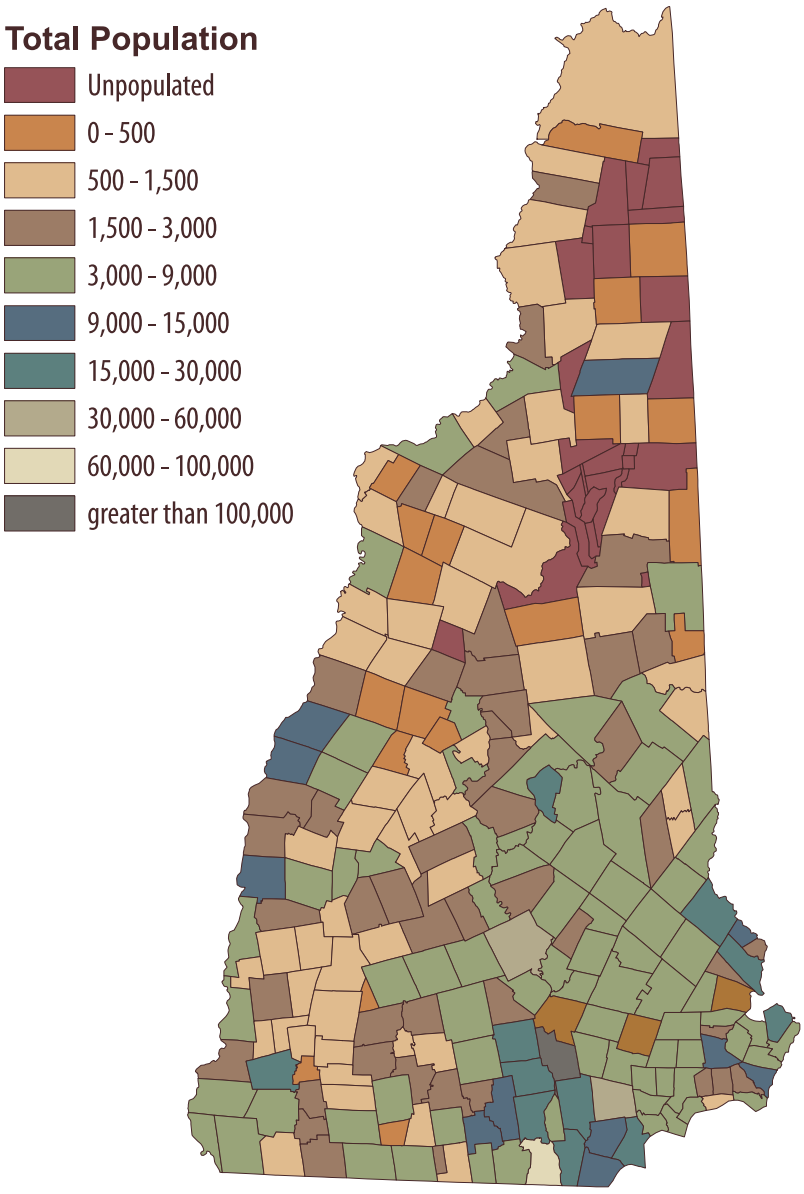
Chapter Headings

To simplify this report, we collapsed our summary of health determinants into five chapters that describe key concepts used for health planning:

Chapter One: Population Demographics
Chapter Two: Current Health
Chapter Three: Risks to Future Health
Chapter Four: Health Care
Chapter Five: Future Challenges

POPULATION DEMOGRAPHICS

New Hampshire's population is growing, aging and becoming more diverse.



Source: U.S. Census, 2000 [12]

NEW HAMPSHIRE'S POPULATION IS CHANGING

New Hampshire's population is growing, becoming older and becoming more diverse. These demographic changes have important implications for the future health of the New Hampshire public, for the development of our medical and public health systems and for our natural environments.

Current Population

New Hampshire's population of 1,299,169 people live in 234 towns on 8,968 square miles of land [13]. The age and sex distribution of New Hampshire's population is similar to that of the U.S. [14].

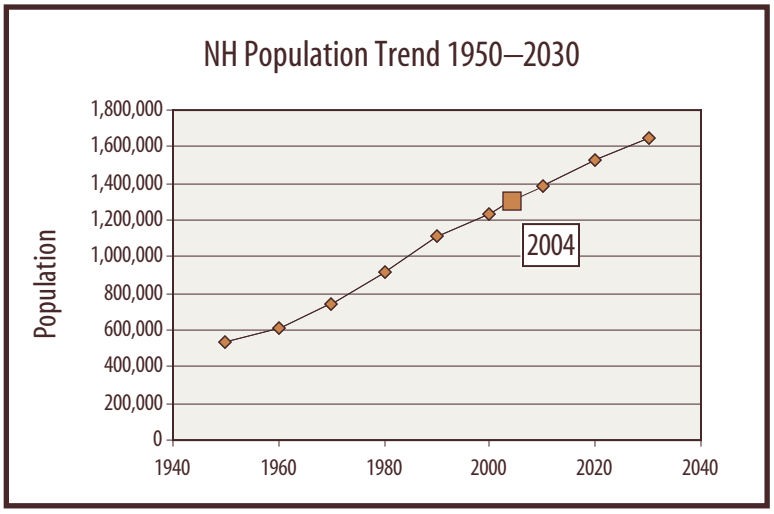
New Hampshire has a slightly older population compared to the U.S. The median age of a New Hampshire resident in 2005 was 39.5 years compared to a median age of 36.4 years for a U.S. resident [15].

2004 NH Population Overview		
Age Category	Count	% of Population
<1	14,072	1.1%
1 to 44	776,674	59.8%
1 to 14	232,881	17.9%
15 to 24	179,723	13.8%
25 to 34	148,600	11.4%
35 to 44	215,470	16.6%
45 to 74	430,176	33.1%
45 to 54	208,859	16.1%
55 to 74	221,317	17.0%
75 Plus	78,247	6.0%
TOTAL	1,299,169	100.00%

Source: U.S. Census, 2004 [13].

New Hampshire's Growing Population

New Hampshire has grown faster than any other New England state during the last four decades [16]. The state's population has increased at an average annual rate of 2.6%, from 533,242 in 1950 to 1,308,679 in 2004. From 2005 to 2030 New Hampshire's population is projected to grow at a rate of 1% per year. It is estimated that from 2004 to 2030 the state's population will increase by a total of 337,792 persons.



Source: U.S. Census, International Data Base, 2005 [17].

Who is Moving into New Hampshire and Where are They Moving to?

Most of New Hampshire's population growth stems from people moving into New Hampshire from other states and from immigrants and refugees [6]. Rates of population growth vary across different areas of the state. Between 1960 and 2000 more than sixty percent of the state's population growth occurred in the counties of Hillsborough (in the Manchester-Nashua metro area) and Rockingham (in the Southeast region of the state). In 1960 these two counties together accounted for 46% of the state's population share and in 2000 for about 53%. It is projected (up to 2025) that these counties will continue to account for more than 50% of the state's population.

However, while much of New Hampshire was growing from 1960 to 2000, Cheshire, Sullivan, Grafton and Coos counties lost some state share of the population, with Coos losing the largest share (6.1% of the state's population lived in Coos County in 1960 while only 2.27% of the state's population lived in Coos County in 2000) [18]. Cheshire and Grafton counties are projected to continue to lose population through 2025 [18].

Percentage of NH Population by Selected Counties

	1960	2000	2025
Hillsborough	29.4%	30.8%	30.2%
Rockingham	16.3%	22.4%	22.5%
Total	45.7%	53.2%	52.7%

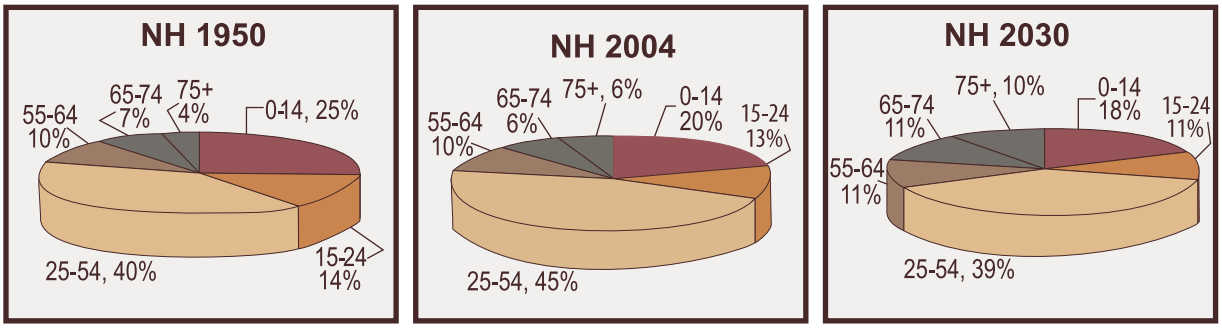
Source: NH Office of Energy and Planning, 2004 [18].

Implications of a Growing Population

New Hampshire is growing rapidly. Each year New Hampshire loses 17,500 acres of forestland, as well as its farmland, to development and urban sprawl. (Urban sprawl is irresponsible, poorly planned development that destroys green space, increases traffic and air pollution, crowds schools, drives up taxes and stresses or overcomes municipal services [19].) Additionally, only 10% of the land around public water supplies is protected [16].

Population growth and subsequent urban sprawl in the U.S. and in New Hampshire have implications for the protection of our natural environments. For example, the increased demands for living space and roads must be weighed against the need for protection of our green space and of air and water quality in the state.

New Hampshire's Aging Population



Sources: U.S. Census, 2000 [14].
NH Office of Energy and Planning, 2004 [18].

Between 1950 and 2004, the percent of the population under age 25 years decreased from 39% to 33%. It is projected that this decline in the state's younger population will continue and that by 2030 only twenty-nine percent of the population will be below the age of 25. It is also projected that New Hampshire's elder population, as a percent of the overall population, will increase from 12% to 21% by the year 2030 [14, 18]. This faster growth rate of New Hampshire's older population and concurrent slower growth rate of New Hampshire's younger population will result in the aging of the state's population overall.

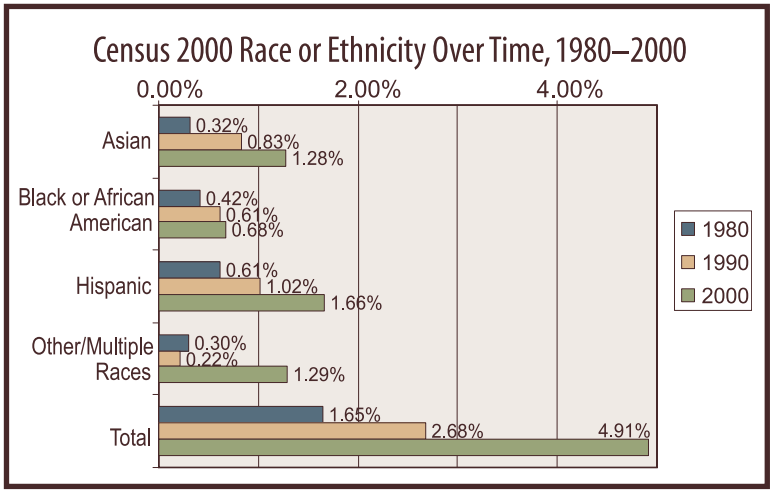
Implications of an Aging Population

The aging of the population in New Hampshire will have important consequences for the medical care system of the state as well as for its community and state public health systems.

As the older fraction of the population increases, more services will be required for the treatment and management of chronic and acute health conditions. The need for a "full continuum of care for the frail elderly will become fully apparent in the next several decades. This will greatly expand the demand for nursing home capacity, congregate care facilities, adult day care programs and respite, as well as for other care giver support programs" [10] including enhanced community support systems. Additionally, enhanced services outside of the realm of the typical "medical model" of care will be essential for maintaining the function and well-being of our elders. For example, as persons age, the need for enhanced and accessible transportation, housing, nutrition, and social service supports from the local community and from friends and families increases.

A More Diverse Population

New Hampshire's population has slowly become more diverse in the past twenty years. In 1980, 1.65% of the population identified themselves as having a racial background or ethnicity other than white. By 2000, this had increased to 4.91% [14].



Source: U.S. Census, 2000 [14].

The rate of population change by race and ethnicity has not been the same across all New Hampshire communities. In both the cities of Manchester and Nashua rates of growth of minority and ethnic populations exceeded those of New Hampshire overall. In Manchester between 1990 and 2000, the Black or African American population grew by about 157% compared to about 25% growth for the state. The Hispanic population grew by 126% compared to 72% growth for the state. In the same time period, the Asian population of Nashua grew by about 130% compared to a 75% growth rate for the state [20]. Increases in enrollment in the *Limited English Proficient Programs* have more than doubled in the past ten years from 1,126 students in 1993–1994 to 2,755 students in 2003–2004. This is yet another indicator of the state's increasing diversity [6].

Implications of a More Diverse Population

Based on national level data, many measures of mortality, disease incidence, and disability differ significantly by race and/or ethnicity. For example, in 2003 the age-adjusted death rates for Black or African Americans were 43% higher for stroke, 31% higher for heart disease, 23% higher for cancer and almost 750% higher for HIV disease compared to non-Blacks; and in addition, a higher percent of Black or African Americans (15.4%) reported having some limitation of activity caused by chronic conditions compared to 10.2% of non-Blacks [21].

The reasons for these differences in health status are due to "complex and poorly understood interactions among socioeconomic, psychosocial, behavioral, and health care related factors" [1]. These factors need to be taken into account when developing public health interventions for diverse populations.

New Hampshire's Growing Refugee Population

From 1998 to 2005, 3,585 refugees resettled in New Hampshire, mostly in Hillsborough County within the city of Manchester [18]. Other New Hampshire cities with significant refugee resettlement are Concord, Laconia and Franklin. Refugees are persons sponsored by the federal government to come to the United States because they have been forced out of their own countries due to fear of persecution.

NH Refugees Resettled Between 1998–2005		
	Number	Percent of Refugee Population
Manchester	2,658	74%
Concord	366	10%
Laconia	256	7%
Franklin	165	5%
Total	3,585	96%

Concord: Somali Bantu, Liberians, Afghanis
Laconia: Bosnians, Sudanese
Manchester: Bosnians, Somali Bantu, Sudanese, Liberians

Source: NH Office of Energy and Planning, 2004 [18].

Implications of Refugee Resettlement

In the past, the resettlement program has been comprised of large groups of refugees such as the Vietnamese and Bosnians who were resettled in the U.S. over nearly a decade. This ethnic concentration gave both the ethnic communities themselves and the service providers the ability to address common language and cross-cultural needs fairly efficiently.

However, the current trend to resettle fewer refugees from multiple and diverse countries makes resettlement more challenging. For example, over 90 different languages are now spoken in the Manchester schools.

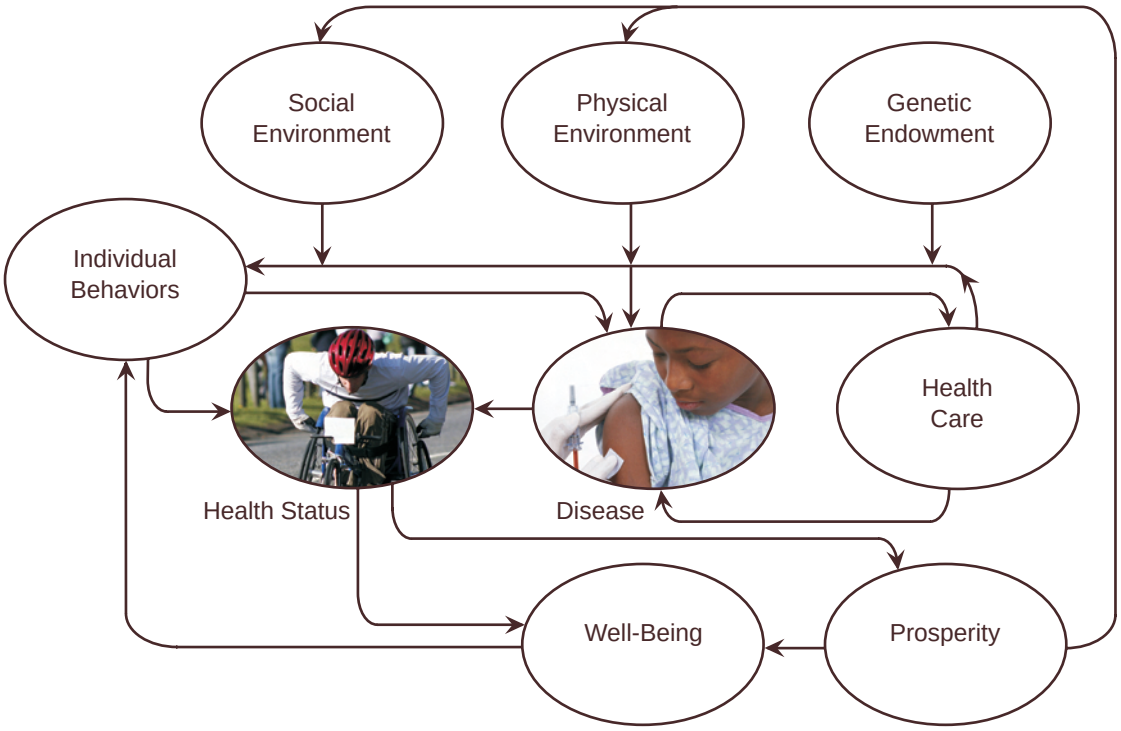
Resettlement efforts are more challenging now than they were in the past because the recent refugee populations—such as the Liberian and Somali Bantu populations—are from developing nations with vastly different cultural values. Additionally, they have experienced extreme, prolonged periods of deprivation in which basic education, health care, and adequate nutrition were nonexistent. Thus—even though the absolute numbers of refugees resettled in New Hampshire appears small—the ensuing cultural, linguistic and health needs that these groups bring to the state and to their new communities are initially challenging to the mainstream service provider community.

CURRENT HEALTH

Health is "a state of well-being and the capacity of individuals to function in the face of changing circumstances"

(Institute of Medicine, 1997 [10])

Evans & Stoddard Field Model of Health and Well-Being

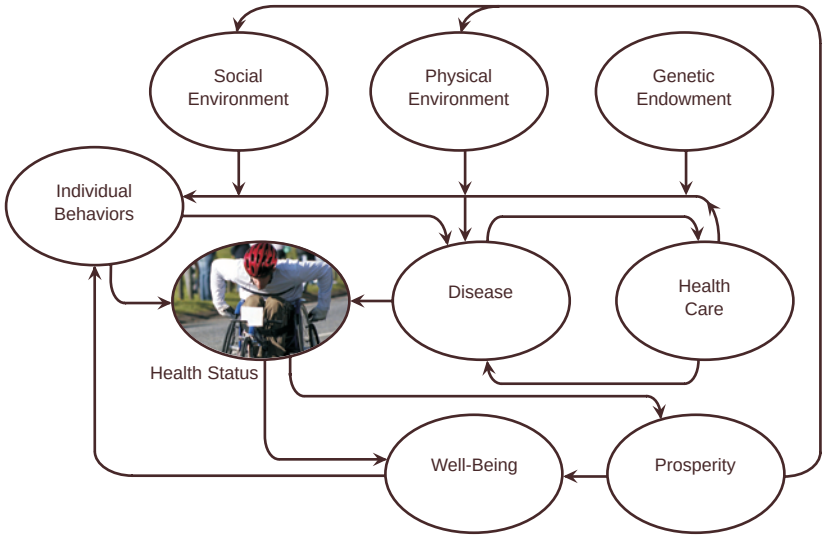


Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

HEALTH STATUS

Producing, improving and protecting the current health and well-being of the New Hampshire public are the main goals of the New Hampshire Department of Health and Human Services (DHHS), Division of Public Health Services.

Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

"The mission of the DHHS, Division of Public Health Services, is to assure the health and well-being of communities and populations in New Hampshire—by promoting and protecting the physical, mental and environmental health of its residents—and by preventing disease, injury, disability and death."

The Institute of Medicine (IOM) has proposed that states develop key indicators that are collected and summarized on a regular basis to reflect the health status of a population. Indicators proposed by the IOM are summarized in the table on the page below [10]. These indicators are similar to those used on national polls that rank states on how healthy they are. From these indicators, we observe that New Hampshire has lower infant mortality rates and lower rates of deaths from motor vehicle crashes, suicides, homicides, and heart disease compared to the U.S. population. In addition, there have been fewer new cases of AIDS, Measles, Tuberculosis and Syphilis. Finally, teen birth rates and rates of confirmed abuse and neglect cases among children are lower in New Hampshire compared to the national rates. Thus, on these specific key indicators, New Hampshire is doing very well when the benchmarks for comparison are national rates or averages.

However, comparisons such as these can be misleading in that they do not reflect the fact that New Hampshire is a state with population demographics that are very different from those of the nation. Because New Hampshire's population is more affluent and less diverse, we should expect to have better health indicators when we compare ourselves to the rest of the nation.

IOM Indicator	Year	NH	US
Infant mortality rate /1,000 live births*	2003	4	7
Age-adj death rate from Motor Vehicle Crashes/100,000 pop **	2003	10	15
Age-adj death rate from Work Related Injuries/100,000 pop **	2002	3	4
Age-adj death rate by suicide/100,000 pop *	2002	10	11
Age-adj death rate from Murder/100,000 pop!	2005	1	6
Age-adj death rate from Lung Cancer/100,000 pop !!	2003	41	41
Age-adj death rate from Breast Cancer/100,000 pop !!	2003	25	25
Age- adj death rate from Heart Disease death rate/100,000 pop **	2003	211	232
Age adjusted death rate all causes/100,000 pop **	2004	761	801
AIDS cases reported/100,000 pop **	2004	3	15
New cases of Measles/100,000 pop ^^	2005	0.08	0.02
New cases of Tuberculosis/100,000 pop ^^	2005	0.46	3.90
Cases of Syphilis/100,000 pop ^^	2005	1.15	2.71
Teenage birth rate (ages 15-19) *	2004	18	42
Number/rate confirmed abuse and neglect cases among children/1,000 children under age 18 years +	2003 NH 2001 US	5	12.4

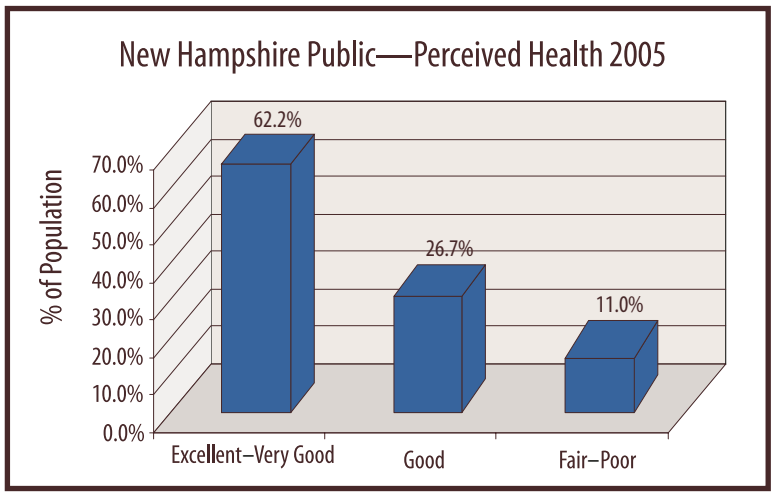
Sources: * Morgan Quito Press, 2006 [3].
** Kaiser Family Health Facts.org. [22–27].
! FBI, Uniform Crime Reports, 2005 [28].
! ! National Cancer Institute [29, 30].
^^ CDC Wonder, Centers for Disease Control, U.S. Census [31].
+ Child Health USA, 2000 and Kids Count New Hampshire, 2003 [32, 33].

Perceived Health

Also important—when thinking about health status—is how an individual feels about his/her own health and ability to function in daily life [2]. How an individual perceives his/her health is particularly influenced by disease status and by health behaviors.

The one measure that New Hampshire collects on a routine basis that reflects perceived health (regardless of any medical diagnosis) is the "general health" question that is asked on the New Hampshire Behavioral Risk Factor Surveillance Survey (BRFSS).

For example, in 2005 when New Hampshire residents were asked how they viewed their overall health, most residents reported that their health was excellent or very good (62.2%), 26.7% reported that their health was good and 11% of the public reported that their health was only fair or poor [34].



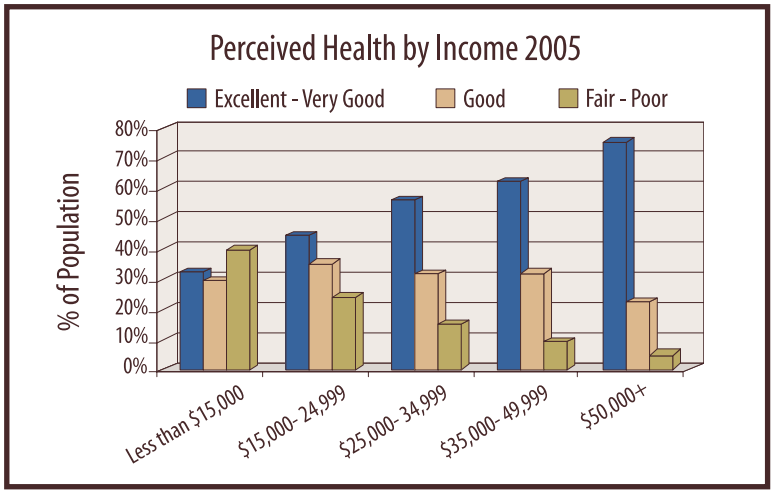
Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [34].

Implications of Health Status

Research indicates that individual and population health is determined by many interacting factors [2]. Thus, efforts to improve and maintain the health of populations and individuals must take into account medical interventions as well as the broad range of conditions in the social and physical environments which affect and shape health behaviors and are associated with health outcomes.

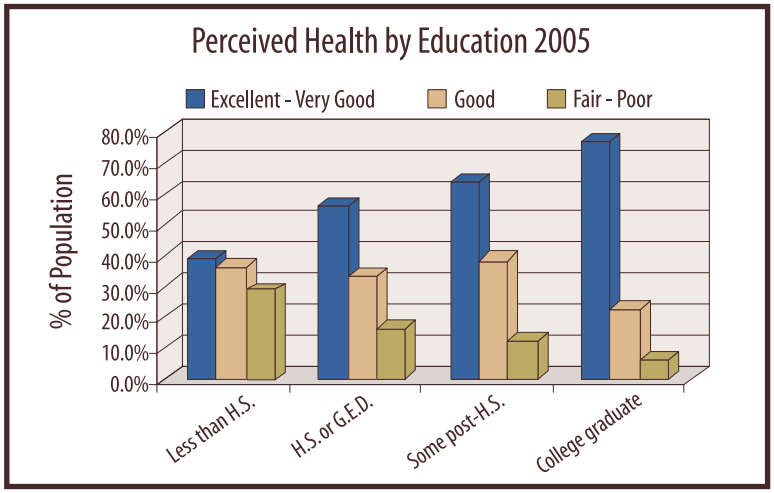
For example, health and well-being are associated with income, education, and race. Therefore—although the majority of New Hampshire residents perceive their health to be excellent to good—residents with lower incomes, lower education status, and minorities are more likely to report being in fair or poor health. Thus, the state must continue to focus on the development of its public health and health care system in order to accommodate and adapt to changes in population demographics, in disease status and in health behaviors.

In 2005, a greater percent of New Hampshire residents with lower incomes rated their health as fair to poor compared to those with higher incomes.



Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [34].

Additionally, New Hampshire residents with less education were more apt to report that their health was fair or poor compared to residents with higher levels of education.

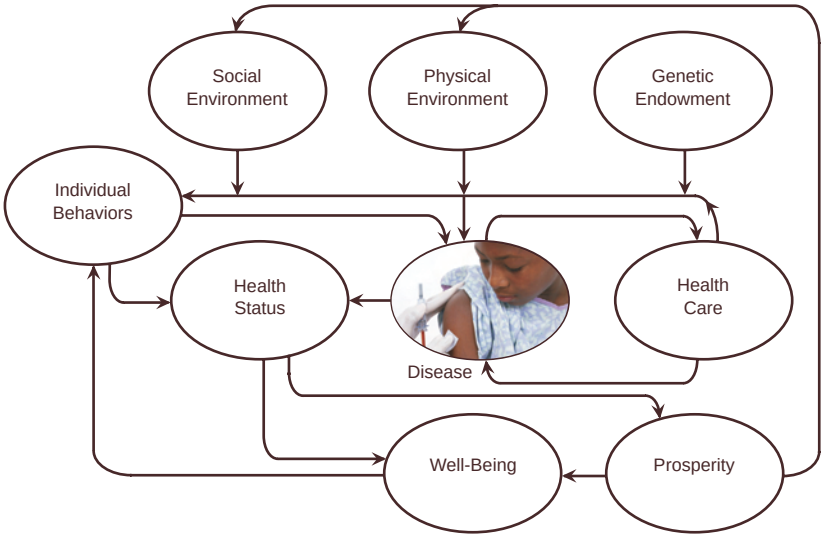


Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [34].

DISEASE & ILLNESS

Measures of mortality, morbidity, and injury help to describe the burden of illness and disease of a population. On the following page, we describe first the "leading causes of death in New Hampshire" and then selected health issues and chronic diseases for which New Hampshire has good data. Together these indicators provide a summary of the current burden of illness and disease that New Hampshire must consider as it works to improve the health of its current and future populations.

Evans & Stoddard Field Model of Health and Well-Being



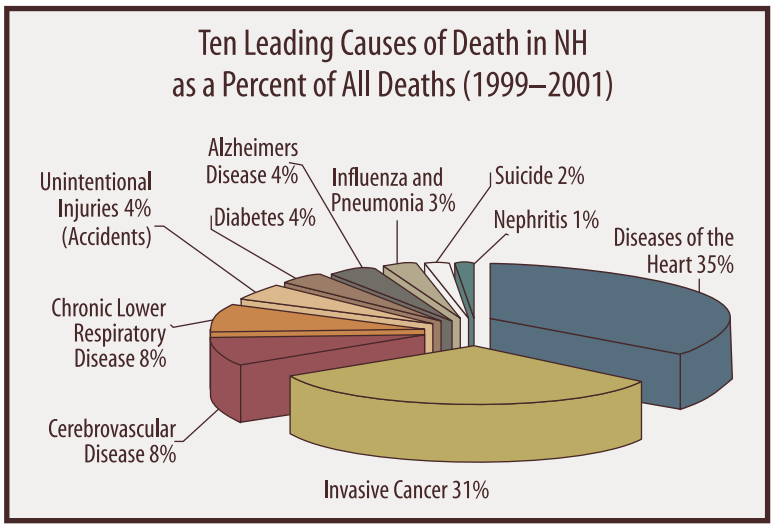
Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

Measures of disease reflect individual and population health as viewed from the perspective of the medical system. Disease status is associated with an individual's social and physical environments, individual behaviors and access to health care, as well as genetic endowment.

Leading Causes of Death in New Hampshire

Deaths are easy to assign to individuals and to count using state data; therefore, "leading causes of death" are often used to describe the current burden of disease of a population.

Between the years 1999–2001, the top ten leading causes of death for all New Hampshire residents, ranked by greatest number of deaths, were: diseases of the heart, invasive cancer, cerebrovascular disease, chronic lower respiratory disease, unintentional injuries, diabetes, Alzheimer's disease, flu and pneumonia, suicide, and nephritis (inflammation of the kidneys). Two-thirds of all deaths (66%) were attributed to heart disease and cancer.



Source: Bureau of Disease Control and Health Statistics, Leading Causes of Death of NH Residents (1999–2001), 2005 [35].

It is interesting to note that eight of the top ten leading causes of death in 1950 are still in the top ten leading causes of death in the year 2000.

Top Ten Leading Causes of Death in New Hampshire

New Hampshire 1950				New Hampshire 1999–2000			
Rank	Cause of Death	Count of Deaths	% of All Deaths	Rank	Cause of Death	Count of Deaths	% of All Deaths
1	Heart Disease	2,119	35%	1	Heart Disease	8,408	29%
2	Cancer	971	16%	2	Invasive Cancer	7,287	25%
3	Cerebral Hemorrhage	480	8%	3	Cerebrovascular Disease	1,968	7%
4	Accidents	303	5%	4	Chronic Lower Respiratory	1,791	6%
5	Influenza and Pneumonia	154	3%	5	Accidents	1,038	4%
6	Aterio Sclerosis	153	3%	6	Diabetes	885	3%
7	Diabetes	120	2%	7	Alzheimer's Disease	846	3%
8	Suicide	87	1%	8	Influenza and Pneumonia	591	2%
9	Nephritis	74	1%	9	Suicide	455	2%
10	Congenital Malformations	73	1%	10	Nephritis	335	1%

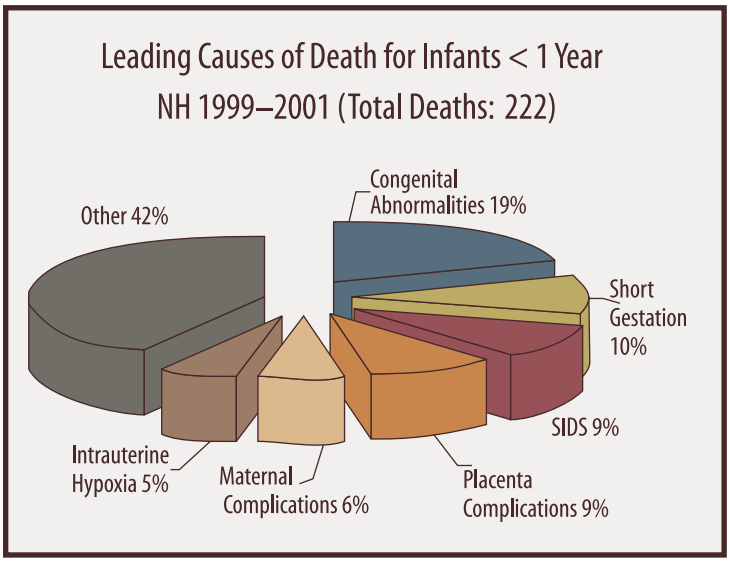
Sources: Public Health Statistics, New Hampshire State Department of Public Health, 1950 [36].
Bureau of Disease Control and Health Statistics, Leading Causes of Death of NH Residents (1999–2001), 2005 [35].

Leading Causes of Death by Life Cycle Stages

Leading causes of death differ based on where an individual is in his/her life cycle. For example, most deaths that occur around the time of birth and before one year of age are due to congenital anomalies or short gestation. Among children and adults up to the age of 44, the leading cause of death is unintentional injury. Adults over the age of 44 and seniors most frequently die from chronic diseases.

Below, we describe the leading causes of death of the New Hampshire population based on four different age groups determined by the life cycle stage for the years 1999–2001 [2].

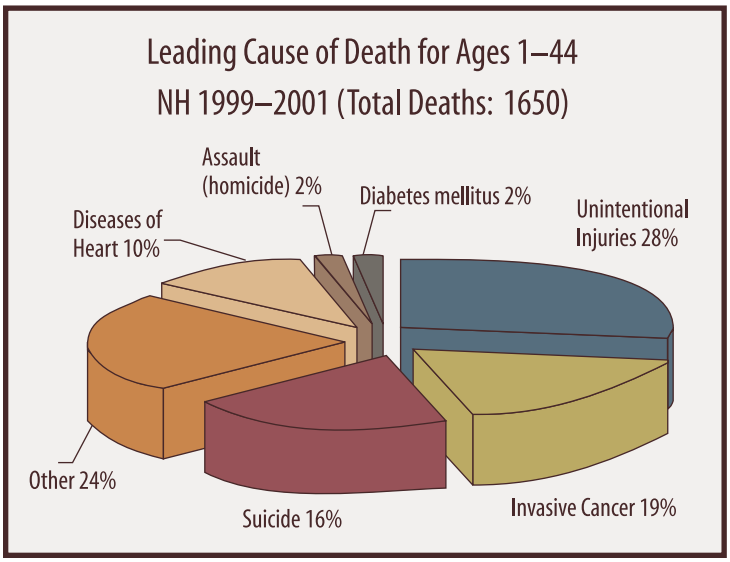
Birth Stage (below 1 Year of age)



Source: Bureau of Disease Control and Health Statistics, Leading Causes of Death of NH Residents (1999–2001), 2005 [35].

The death rate for New Hampshire infants below the age of one year (513 deaths/100,000 infants) was lower than the U.S. death rate (694 deaths/100,000 infants U.S.) for the same time period 1999–2001. The total number of New Hampshire infants who died during 1999–2001 (222 deaths) exceeded the total number of deaths for children between the ages of 1–14 (121 deaths) [35, 37]. The pie chart on the left describes the leading causes of death for infants below the age of one year.

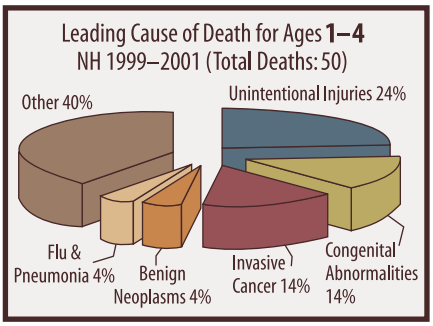
Injury Stage (ages 1–44 years)

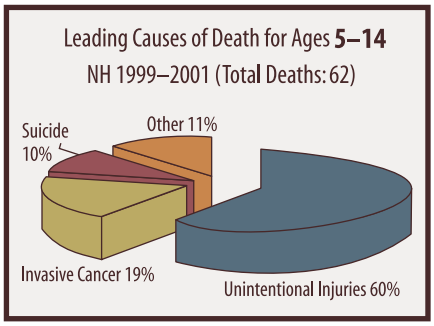


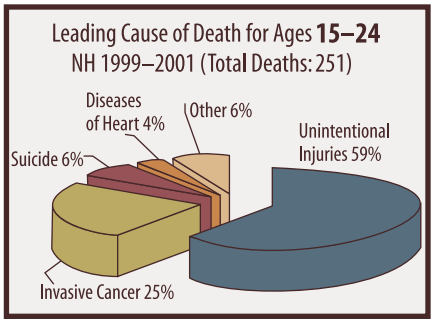
Source: Bureau of Disease Control and Health Statistics, Leading Causes of Death of NH Residents (1999–2001), 2005 [35].

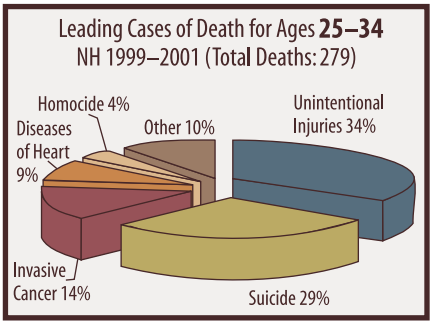
From 1999–2001, unintentional injuries were the leading cause of death for New Hampshire residents between the ages of one year to 44 years (457 deaths), followed by deaths from invasive cancer (311 deaths), and suicide (266 deaths). These three leading causes of death accounted for 62.6% of all deaths for this age group of residents.

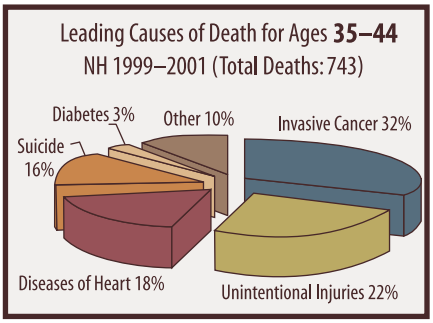
The following pie charts describe the cause of death by smaller age groups within the "Injury" life-cycle stage (ages 1–44 years). For each of these age categories the leading cause of death continues to be unintentional injury, except for those who are between 35–44 years of age, when unintentional injury is the second leading cause of death after cancer.





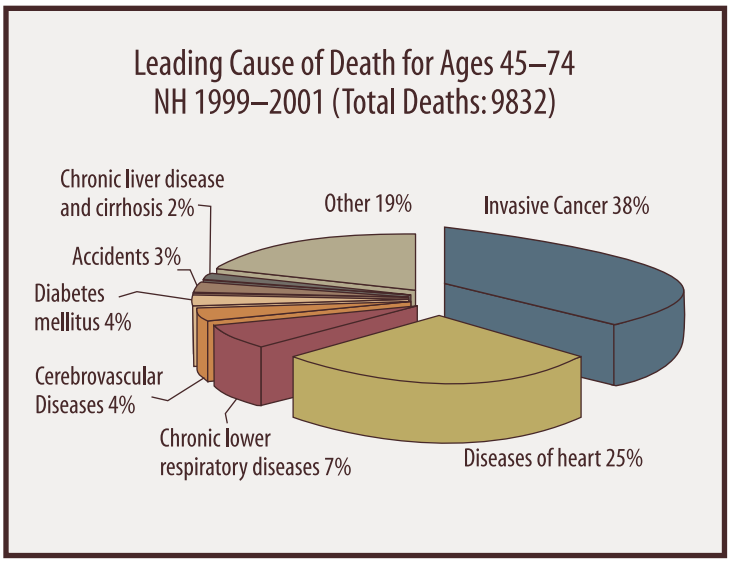






Source [36] Bureau of Disease Control and Health Statistics, Leading Causes of Death of NH Residents (1999–2001), 2005 [35].

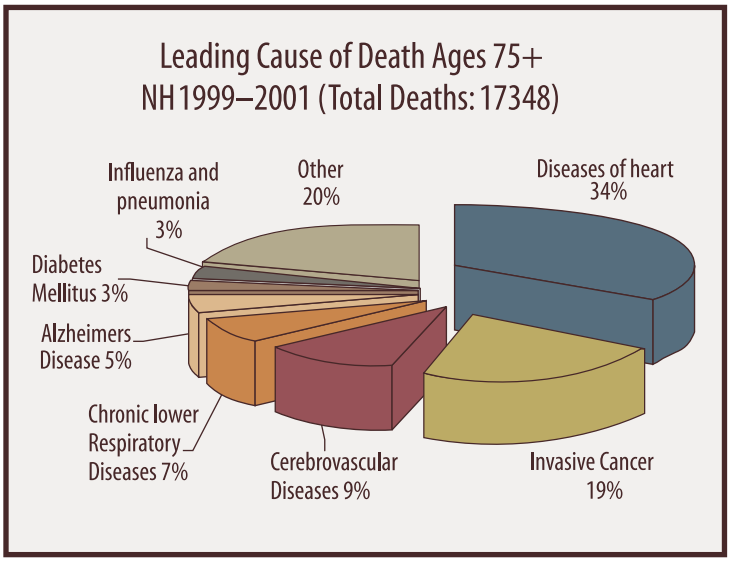
Chronic Disease Stage (ages 45–74 years)



Source: Bureau of Disease Control and Health Statistics, Leading Causes of Death of NH Residents (1999–2001), 2005 [35].

The leading cause of death for New Hampshire adults ages 45–74 is chronic disease. Between the years 1999–2001, invasive cancer accounted for 38% of all deaths (3,721 deaths) in this age group and diseases of the heart accounted for 25% of all deaths (2,446 deaths).

Aging Stage (ages 75+ years)



Source: Bureau of Disease Control and Health Statistics, Leading Causes of Death of NH Residents (1999–2001), 2005 [35].

Most frail elders die with a diagnosis of at least one chronic disease condition. Diseases of the heart, invasive cancer and cerebral vascular disease were the leading causes of death for New Hampshire's elders during 1999–2001.

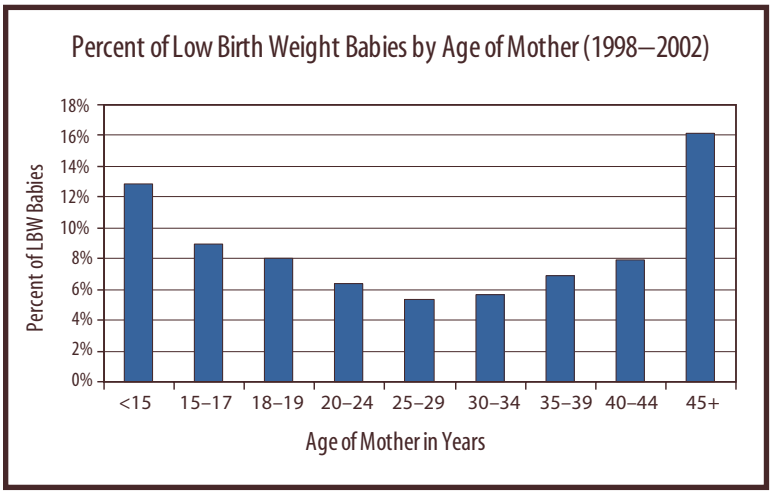
THE BURDEN OF SELECTED HEALTH ISSUES

Strong and well-supported public health systems that involve community leaders, local government, and the medical system can prevent or decrease the prevalence of health issues such as births to low birth weight babies, unintentional injuries, suicides, falls, flu and pneumonia among elders.

Low Birth Weight (LBW)

Between the years 1998–2002, 7.3% of all live births in New Hampshire were associated with LBW or very LBW. Key public health strategies for reducing infant mortality are focused on decreasing LBW births [38] and on improving the health of pregnant women. Many of the risk factors for LBW can be prevented with good prenatal counseling and early prenatal care. Prenatal visits offer an opportunity to provide information about the adverse effects of substance use, including alcohol and tobacco during pregnancy [39]. Research has demonstrated that preconception care plays an important role in improving birth outcomes as well, since there are some factors for which prenatal care is too late to address. For example, since at least half of all pregnancies are unexpected, it is recommended that all women of childbearing age take a daily dose of a vitamin supplement containing folic acid. Folic acid can reduce the occurrence of neural tube defects by two thirds. Education during primary care visits is necessary to promote evidence-based preconception care guidelines [40].

Maternal socioeconomic risks for LBW include mother's age (being very young or being older), having less education, having a relatively low income and being unmarried. The chart below illustrates how maternal age is associated with the risk of LBW births for New Hampshire mothers.



Source: NH Division of Vital Records [41].

Smoking is also associated with LBW. Nationally, about 12% of live births to mothers who smoked were associated with LBW births compared to about 8% for non-smoking mothers. In New Hampshire during 1998–2002, about 160 out of every 1,000 births were to mothers who reported smoking during pregnancy. In 1998, New Hampshire communities established the following Healthy New Hampshire 2010 goals to improve birth outcomes [11].

NH not meeting health goals NH is getting better NH has met or exceeded goal

NH 2010 Indicator	1998 Baseline*	2003 Data**	2010 Target*
Increase the percent of women who receive early and adequate prenatal care	86.5%	86.3%	90.0%
Reduce the percent of pregnant women who report smoking cigarettes	17.0%	14.2%	10.0%
Reduce low birth weight (<2,500 grams) births	5.7%	6.2% (1998–2002)	5.0%
Reduce very low birth weight (<1,500 grams) births,	1.1%	1.1%	0.8%

Source: * Healthy New Hampshire 2010, 2001 [11].
** NH Department of Health and Human Services Birth Data Query Tool, accessed 2006 [42].

Implications of Low Birth Weight (LBW)

Short gestation and LBW are among the leading causes of neonatal deaths, accounting for 20% of neonatal deaths nationally as well as for long-term disabilities such as cerebral palsy, autism, mental retardation, and vision and hearing impairments [39].

Although New Hampshire has made some progress on smoking during pregnancy, much work remains for all four of the NH 2010 Indicators in the table above. The state must continue to focus its public health efforts to improve health behaviors; for example, decreasing smoking rates and alcohol use among pregnant women.

Unintentional Injury

All injuries are preventable. Thus, all deaths from injuries are preventable deaths. The term unintentional injury does not include injury or death from suicide or homicides.

For all age groups, unintentional injury in New Hampshire is the fifth leading cause of death and the third leading cause of years of potential life lost. We use the measure "years of potential life lost" throughout this document to describe the relative impact of various diseases. The measure is developed simply by calculating the years between the age of death and seventy-five years for individuals dying before the age of 75. In this case, we assume that the average life expectancy is about 75 years. Thus, if one dies at age 65 years he has died prematurely and has "lost" potentially ten years of a healthy life. The relative impact of unintentional injuries for the New Hampshire public is great when described in terms of years of potential life lost, due to the many deaths from injuries for younger individuals.

In New Hampshire, unintentional injury is the leading cause of death for all age groups between one and 34 years of age and is the only leading cause of death to be listed in the first ten leading causes of death for every age group except for infants. Men accounted for two thirds of all deaths from injury. The elderly have the highest rate of injury death compared to all other age groups. Additionally, people who live in rural areas have higher rates of deaths from unintentional injury compared to those in urban areas [35].

During 1999–2001, there were 1,038 deaths in New Hampshire due to unintentional injury. Motor vehicle accidents accounted for about 40% of these deaths (385 deaths) followed by deaths from falls (186 deaths) and deaths from poisoning (128 deaths: "a poison is any substance that causes adverse reactions in the body if ingested, spilled on the skin, splashed in the eyes, inhaled, or injected" [43]). As would be expected, most motor vehicle deaths involve young adults, while most deaths from falls involve the elderly [35].

Motor vehicle traffic crashes account for a large share of the burden from death and disability on New Hampshire's public. Not only were motor vehicle crashes the leading cause of death due to injuries between 1999–2001, but they were also "the second leading cause of injury-related inpatient hospitalizations and the fifth leading cause of injury-related emergency department visits [43]. In 2004, thirty-five percent of highway fatalities were related to alcohol use [44].

Unintentional Injury Deaths (All Ages), 1999–2001

Mechanism	Deaths	Percent of Deaths
Motor Vehicle	385	38%
Fall	186	18%
Poisoning	128	12%
Suffocation	66	6%
Fire/hot object	40	4%
Drowning	29	3%
Other land transport	23	2%
Natural/environment	22	2%
Other	77	7%
Unspecified	82	8%
TOTAL	1,038	100%

Source: Health Statistics and Data Management Section of the Bureau of Disease Control and Health Statistics, NH Department of Health and Human Services, 2006 [31].

Implications of Unintentional Injuries

The human suffering that can result from unintentional injuries is staggering. Millions of persons annually are incapacitated by injuries and may suffer lifelong disabilities. Between 1999 and 2001, 530,226 people were cared for in New Hampshire emergency rooms for unintentional injuries. Additionally, 29,416 persons were admitted for a hospital stay with a diagnosis of unintentional injury. Accidents accounted for 26,560 years of potential life lost in New Hampshire during these three years (death before the age of 75 years) [31].

The financial cost of unintentional injury to New Hampshire is substantial. During 1999–2001, total charges for ER visits for unintentional injury were $239,904,427. Additionally, total billed charges for inpatient discharges due to injury were $469,121,578 [31].

"As with other health problems, no single force working alone can accomplish everything needed to reduce the number of injuries. Improved outcomes require the combined efforts of many fields, including health, education, transportation, law, engineering, and safety sciences. Additionally, it costs far less to prevent injuries than to treat them [45]."

For example, as reported by the Centers for Disease Control

- Every child safety seat saves $85 in direct medical costs and an additional $1,275 in other costs.
- Every bicycle helmet saves $395 in direct medical costs and other costs.
- Every smoke detector saves $35 in direct medical costs and an additional $865 in other costs.
- Every dollar spent on poison control centers saves $6.50 in medical costs.

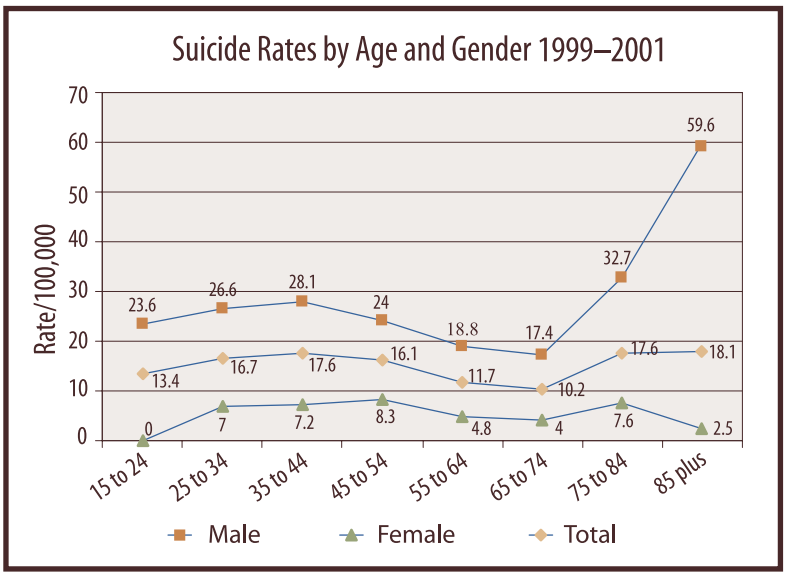
Suicide

For all age groups, suicidal behaviors—including attempts as well as completed suicides—are a significant cause of death, hospitalization and emergency treatment in New Hampshire [46].

In 2001 in New Hampshire, as reported by the *New Hampshire Plan for Suicide Prevention* [46]:

- Suicides outnumbered homicides nearly six to one.
- Suicide was the second leading cause of death for those under the age of twenty-five.
- 170 people died, over 733 were hospitalized and over 1,500 persons were treated in emergency departments for self-inflicted injuries.
- The cost of treating suicide attempts and suicides in acute care settings was about $6.2 million dollars.

Rates of suicide differ by gender and age. Between 1999 and 2001, males at every age were more apt to be victims of suicide than females. Rates of suicides for both genders were higher between the ages of 25–44, decreasing after age 44 and then increasing again after the age of 74. For males over the age of 85 years, suicide rates were about 26% higher than for females of the same age. Suicide was the second leading cause of death for young people ages 15–34 years [35].



Source: Bureau of Disease Control and Health Statistics, Leading Causes of Death of NH Residents (1999–2001), 2005 [35].

Implications of Suicide

Suicide is a significant public health problem in New Hampshire [46] and accounted for 14,633 years of potential life lost between 1999–2001 (death before age 75 years). Beyond the impact on the people whose lives are lost to it, suicide has an economic impact and an enormous effect on communities. For each suicide death, there are an estimated six survivors of suicide—the family and close friends. In addition, many others are affected, including those providing emergency care to the victims and those who feel they failed to prevent the death.

Most worrisome for New Hampshire are the recent responses from New Hampshire students in grades nine through twelve to the 2005 New Hampshire Youth Risk Behavior Survey (YRBS) [47] in regard to suicide and suicide ideation.

Reporting on the time frame of the past twelve months, and for those students who completed the 2005 YRBS [47]

- 24.9% reported feeling so sad or hopeless for almost every day for two weeks or more in a row that they stopped doing some of their usual activities,
- 14% reported that they had seriously considered attempting suicide,
- 11.8% reported having made a plan about how to attempt suicide,
- 7.1% reported having attempted suicide, and
- 1.6% of suicide attempts resulted in an injury, poisoning or overdose treated by a professional.

Suicide is generally preventable. New Hampshire has in place a *State Plan for Suicide Prevention* [46] which lays the groundwork for suicide prevention. This is an important document which should be considered as the state develops its public health plans for the future.

PREVENTABLE DEATHS FOR FRAIL ELDERS

While death is an inevitable last phase of life, some deaths, for example deaths from falls, pneumonia and influenza might be avoided even for the frail elderly through the implementation of community-based programs that better protect our elders.

Falls

Decreasing the numbers of deaths from falls among New Hampshire's frail elders is a Healthy New Hampshire 2010 goal. Between 1999 and 2001 there were 194 deaths associated with injuries from any cause among elders 75–84 years of age. Thirty-one percent of these deaths (62 deaths) were due to fall injuries. Among those elders 85 years of age and older, 37% of the injury deaths (60 deaths) were due to fall injuries [31].

Flu and Pneumonia

Elderly persons with chronic conditions such as heart disease, cancer, and diabetes are much more susceptible to get and die from complications of influenza and pneumonia. During 1999–2001, 591 New Hampshire residents died from influenza and pneumonia. Ninety-two percent (547) of these deaths occurred in residents over the age of 64 years. The table below illustrates how the rate of death from these two diseases increases with age. For example, for those ages 55–64 there were 5.1 deaths per every 100,000 persons in that age category. For those 85 years of age and better, there were 551.7 deaths per every 100,000 persons in that age category.

New Hampshire Resident Deaths from Influenza and Pneumonia 1999–2001

Age Group	Number of Deaths	Number of Persons	Rate/100,000 Persons
55 to 64	17	332,473	5.1
65 to 74	67	234,460	28.6
75 to 84	176	153,628	114.6
85 plus	304	55,099	551.7
All Ages (0-85+)	591	3,713,414	16.7 (Adjusted Rate)

Source: Health Statistics and Data Management Section of the Bureau of Disease Control and Health Statistics, New Hampshire Department of Health and Human Services [31].

Implications of Flu and Pneumonia

Death from flu and pneumonia accounted for 1,604 years of potential life lost between the years 1999-2001 (death before the age of 75 years). Since vaccines for both of these diseases are available free of charge to elders through the senior health plans provided through Medicare, there is no barrier to obtaining these vaccines through insurance.

The percent of residents over 64 years of age who report obtaining these vaccines has increased since 1999 but should be higher according to best medical practice standards.

■ NH not meeting health goals ■ NH is getting better ■ NH has met or exceeded goal

NH 2010 Indicator	1999 Baseline*	2005 Data**	2010 Target*
Increase the percent of independently living adults age 65 or over who report ever having been vaccinated against pneumococcal disease	60%	70%	90%

Source: *Healthy NH 2010 [11]; **Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [48].

THE BURDEN OF CHRONIC DISEASE

Disease patterns have changed in the United States over the past century. While most deaths and illness in the early 1900s resulted from infectious diseases, today we find that most deaths and illness result from chronic disease conditions. "Collectively, deaths in the United States due to infectious diseases declined from approximately 650 deaths per 100,000 population in 1900 to approximately 20 deaths per 100,000 in 1970, a decline of 96% [49]."

Changes in Top Ten Leading Causes of Death in New Hampshire		
1891 NH*	1950 NH**	1991–2000 NH***
Consumption	Heart Disease	Heart Disease
Pneumonia	Cancer	Cancer
Heart Disease	Cerebral Hemorrhage	Cerebrovascular Disease
Apoplexy and paralysis	Accidents	Respiratory Disease
Cholera infantum	Influenza and Pneumonia	Unintentional Injuries
Old age	Aterio Sclerosis	Diabetes
Accident and negligence	Diabetes Mellitus	Alzheimers
Cancer	Suicide	Influenza and Pneumonia
Atrophy and debility	Nephritis	Suicide
Bronchitis	Congenital Malformations	Nephritis

Sources: *Evens I.C, Eleventh Annual Report of the State Board of Health of the State of New Hampshire, 1893 [50].
** U.S. Department of Health, Education and Welfare, Vital Statistics of the United States 1950, 1954 [51].
*** Health Statistics and Data Management Section of the Bureau of Disease Control and Health Statistics, NH Department of Health and Human Services [31]

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In 2004, almost half of all people in the United States had a chronic condition, a condition defined as one that is not cured once acquired (such as heart disease or diabetes) [21]. The chronic conditions of heart disease, cancer and stroke (cerebrovascular disease) continue to be the leading causes of death nationally as well as in New Hampshire [35]. In New Hampshire between 1999 and 2001, 60% of all deaths were due to heart disease, cancer and stroke. These conditions accounted for 93,029 years of potential life lost (deaths before the age of 75 years).

It costs more to manage chronic diseases than it does to provide routine medical care. Nationally, in any given year, close to half of all health care spending pays for the care received by only five percent of the population—those experiencing serious health care conditions. Some of these conditions last only a short period of time, while others are chronic or ongoing [52].

"Although chronic diseases are among the most common and costly health problems, they are also among the most preventable [53]." Though there is no perfect cross walk between leading causes and actual causes of death, medical evidence suggests that tobacco use, poor diet and lack of exercise are common risk factors that are closely associated with the major chronic diseases of the New Hampshire public. New Hampshire residents can decrease their risks and even prevent many chronic diseases by improving their individual health behaviors.

Heart Disease

Heart disease is the leading cause of death in New Hampshire. It accounts for 29% of all deaths for all ages. Forty-eight percent (48%) of heart disease deaths occur in women.

Deaths from heart disease as defined by the National Center for Health Statistics (NCHS), include deaths from coronary artery disease, congestive heart failure, disease of the heart valves, disease of the pericardium and myocardium, endocarditis and congenital heart disease.

The Centers for Disease Control (CDC) has projected that in 2006 heart disease will cost the nation $250 billion. This figure includes cost of health care services, medications and lost productivity [54].

Reducing the Risk of Heart Disease

"Studies among coronary heart disease patients have shown that 90% have prior exposure to at least one of these heart disease risk factors: high blood cholesterol, high blood pressure, current cigarette use or clinical report of diabetes [53]."

"Lifestyle changes, coupled with dietary and drug therapy, can reduce heart disease [11]." By modifying risk factors such as high blood pressure, high cholesterol, smoking, obesity, and inactivity, New Hampshire adults can reduce their risk of heart disease.

Factors that Increase the Risk of Heart Disease 2005*	
High Blood Pressure	23% of NH Adults were told that they had high blood pressure
High Cholesterol	81% of NH Adults had their blood cholesterol checked in the past five years
	35% of NH Adults who had their cholesterol checked were told that it was high
Smoking	20% of NH Adults are current smokers
Obesity	60% of NH Adults are overweight or obese
Physical Inactivity	44% of NH Adults do not get enough exercise
Diabetes	7% of NH Adults were told that they had diabetes

Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [48].
*Figures are rounded.

Implications of Heart Disease

Heart disease is a disabling disease that can kill both men and women in the prime of their lives. Death from heart disease accounted for 33,171 years of potential life lost in New Hampshire between the years 1999–2001 (death before age 75 years).

In 1998, CDC initiated a heart disease and stroke prevention program that encourages public and private sector partners to work together to develop state plans for addressing these key public health issues.

Invasive Cancer

Invasive cancers are defined as those cancers that have spread to surrounding tissues. These have the potential to also involve other sites. Invasive cancer is the second leading cause of death for New Hampshire residents of all ages and the leading cause of death for those between the ages of 35–75 years [35].

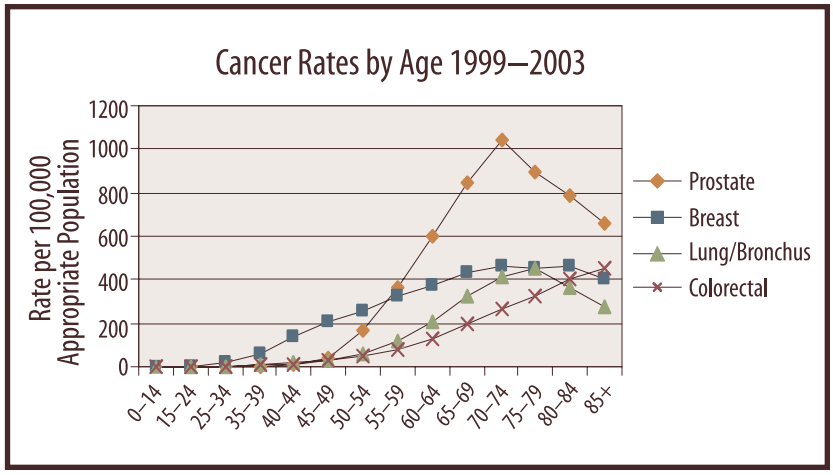
The top ten invasive cancers by incidence for 1999–2003 were prostate, breast, lung and bronchus, colorectal, bladder, melanoma of the skin, non-Hodgkin's lymphoma, uterine, leukemia, and kidney and renal pelvis [55].

Top Ten Cancers—Counts and Rates (1999–2003)

Invasive Prime Site	Counts	Age Adjusted Rate/100,000
Prostate	4,674	165
Breast (female)	4,670	135
Lung & Bronchus	4,263	69
Colorectal	3,401	55
Bladder	1,674	27
Melanoma of the Skin	1,592	25
Non-Hodgkins Lymphoma	1,152	18
Uterine	942	28
Leukemia	782	13
Kidney and Renal Pelvis	741	12
All Primary Cancer SITES	31,369	497

Source: Health Statistics and Data Management Section of the Bureau of Disease Control and Health Statistics, NH Department of Health and Human Services and NH State Cancer Registry [31, 55].

Invasive cancers accounted for 55,354 years of potential life lost in New Hampshire between the years 1999–2001 (death before the age of 75 years). As illustrated by the chart below, the rates of colorectal, lung, breast and most notably prostate cancers increase substantially as we grow older.



Source: Health Statistics and Data Management Section of the Bureau of Disease Control and Health Statistics, NH Department of Health and Human Services and NH State Cancer Registry [31, 55].

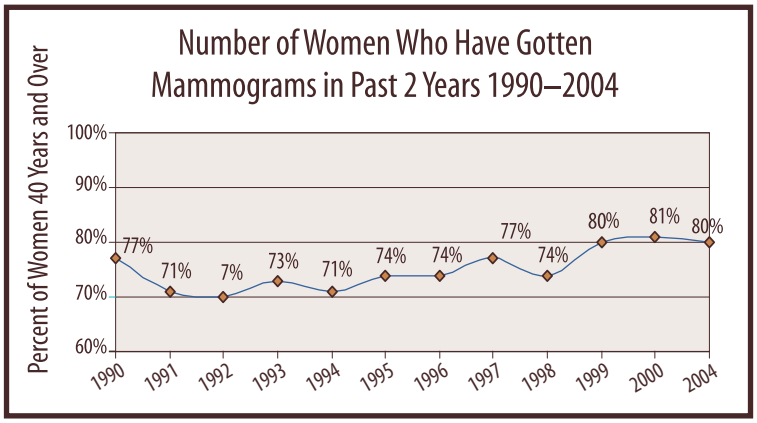
Prevention of Invasive Cancers

Behaviors that help to prevent cancers from occurring include avoiding excessive alcohol consumption and use of tobacco products, eating more fruits and vegetables, and increasing exercise as a way to avoid obesity. Smoking is a leading risk factor for cancer.

Implications of Screening and Early Diagnosis of Invasive Cancers

Many cancers may be cured if diagnosed early by regular screening tests. These include breast, colon, cervix and prostate cancers. The American Cancer Society (ACS) has developed standard screening guidelines for the early detection of some cancers [56]. Nationally, overall use of screening tests is increasing.

For early detection of breast cancer, ACS recommends that women age 40 and older have a mammogram every year. Although in 2004, 80% of New Hampshire women over 40 were getting regular mammograms, 20% of women who should have been getting mammograms were not getting them. This statistic has not changed significantly since 1995.



Source: Behavioral Risk Factor Surveillance Survey (BRFSS) 1990–2004 [57,58].

In regard to colon cancer, stage at diagnosis is the most powerful predictor of survival – the earlier the stage at diagnosis, the greater the length of survival. For this reason the ACS recommends that beginning at the age of 50, men and women participate in one of the following five screening options [59]

1. a fecal occult blood test (FOB) or fecal immunochemical test (FIT) every year,
2. flexible sigmoidoscopy every five years, or
3. an FOB or FIT every year plus flexible sigmoidoscopy every five years, or
4. double-contrast barium enema every five years, or
5. colonoscopy every ten years.

Although the New Hampshire public is doing better than the rest of the nation on getting their screening tests for colon cancer, almost 40% of New Hampshire residents over the age of 50 years reported that they had never had either a colonoscopy or sigmoidoscopy [60].

■ NH not meeting health goals ■ NH is getting better ■ NH has met or exceeded goal

Cancer Site	Evidence-Based Measure*	NH 2004**	U.S. 2004**
Colon	Percent of adults age 50+ who said they have had either a sigmoidoscopy or a colonsocopy	62%	54%
	Percent of adults age 50+ who reported having had a clinical blood stool test within the past two years	35%	27%
Breast	Percent of women age 40+ who reported having had a mammogram within the past two years	80%	75%
	Percent of women who reported having had a clinical breast exam within the past year	78%	89%

Source: * Healthy New Hampshire 2010 [11].
**Behavioral Risk Factor Surveillance Survey (BRFSS), 2004 [61].

Chronic Lower Respiratory Disease

Chronic lower respiratory disease includes chronic obstructive pulmonary disease, emphysema, asthma, and chronic bronchitis and is the fourth leading cause of death in New Hampshire.

The major cause of chronic lower respiratory disease is smoking. Thus, the fact that 15.4% [62] of New Hampshire adults reported smoking everyday (2005 data) is a major public health concern. Air pollution is also associated with respiratory disease. New Hampshire is now working in collaboration with other New England states to reduce air pollution transport from other states and to implement a number of emission reduction programs to attain *National Air Quality Standards* [63].

Implications of Chronic Lower Respiratory Disease

Chronic lower respiratory disease in New Hampshire (1999–2001) accounted for 5,995 years of potential lives lost (death before the age of 75 years) [35]. In the year 2000, New Hampshire had the 13th highest rate of chronic lower respiratory disease compared to all other states (age-adjusted to the 2000 U.S. standard million) [64].

Risk Factors and Prevention as summarized by the American Lung Association:

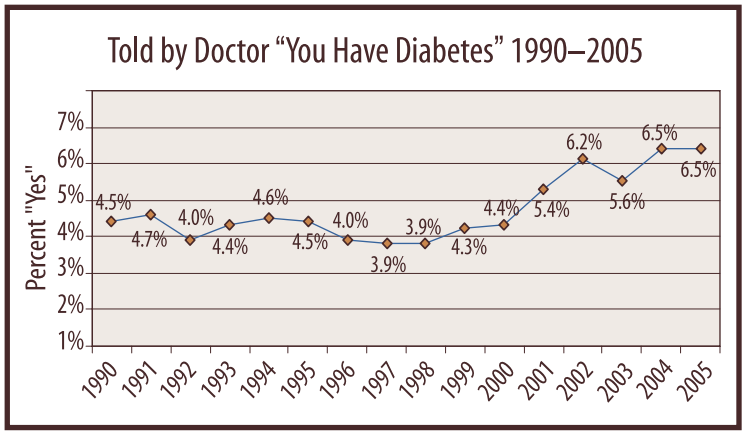
1. Quit smoking or never start. Smoking causes over 80% of chronic lower respiratory deaths. Most patients with these diseases have a long history of heavy cigarette smoking.
2. Avoid second-hand smoke.
3. Reduce exposure to indoor air pollutants such as smoke from cooking and heating.
4. Reduce the incidence of low-birth-weight births by improving maternal nutrition and health. (Low-birth-weight babies are more prone to respiratory diseases.)
5. Avoid occupational dusts and chemicals. Avoid outdoor air pollution such as motor vehicle exhaust fumes.
6. Reduce the incidence of severe childhood respiratory infections.

Diabetes

"...the debilitating effects of diabetes can be lessened by healthy nutrition and physical activity, and by early identification and conscientious management of the disease. Promoting these good health practices is our responsibility... Together, we can make a difference."

~ New Hampshire Governor John Lynch

Diabetes is a disorder in which the body either does not produce or use the hormone insulin correctly. This leads to high blood sugar levels. High blood sugar levels put individuals at risk for several serious health conditions and complications including heart disease, new onset blindness, kidney and nerve damage and limb amputations.



Source: Behavioral Risk Factor Surveillance Survey (BRFSS): Diabetes Awareness, 1990–2005 [65].

In New Hampshire, diabetes is a growing health concern. The percent of New Hampshire adults who reported having been told by their physician that they had diabetes was 6.5% in 2005. Nationally, the prevalence of diabetes is increasing significantly. Diabetes prevalence estimates in New Hampshire appear to mirror this national trend, however more data at the state level are needed before this can be confirmed.

There are several types of diabetes. Type 1 diabetes accounts for 5–10% of all diabetes diagnoses and Type 2 diabetes accounts for 90–95%. The onset of Type 2 diabetes can be prolonged and often prevented by: knowing the risk factors for diabetes and then, working with a medical provider to decrease these risks.

Individuals are more likely to develop Type 2 diabetes if they [65]

- are overweight;
- are 45 years old or older;
- have a parent, brother, or sister with diabetes;
- are African American, American Indian, Hispanic/Latino American, Asian American, or Pacific Islander;
- have had gestational diabetes or gave birth to at least one baby weighing more than 9 pounds;
- have a blood pressure of 140/90 or higher, or have been told that they have high blood pressure;
- have an HDL cholesterol of 35 or lower, or their triglyceride level is 250 or higher; or
- are physically active fewer than three times a week.

Individuals can reduce the risk of Type 2 diabetes by [65]

- eating a healthy, low-calorie, low-fat diet;
- increasing physical activity to moderate intensity; and/or
- losing weight if being overweight is a factor.

Good diabetes medical management, including routine eye and foot exams and close monitoring of blood sugar and blood hemoglobin A1C levels can help prevent complications from diabetes.

Among New Hampshire adults surveyed in 2005, 77% of those diagnosed with diabetes reported that they had obtained an eye exam within the past year. Although the state monitors the percentage of New Hampshire adults with diabetes who receive the A1C test, the survey question used for monitoring this was changed substantially in the year 2000. This makes a comparison to the New Hampshire 2010 baseline impossible. However, the new measure tells us that, in 2005, 91% of New Hampshire adults with diabetes had the A1C test at least once in the past year. This percentage has not changed significantly since the year 2000 when 95% of New Hampshire adults with diabetes had the A1C test at least once (calculations exclude responses of unknown, don't know and never heard of).

Implications of Diabetes

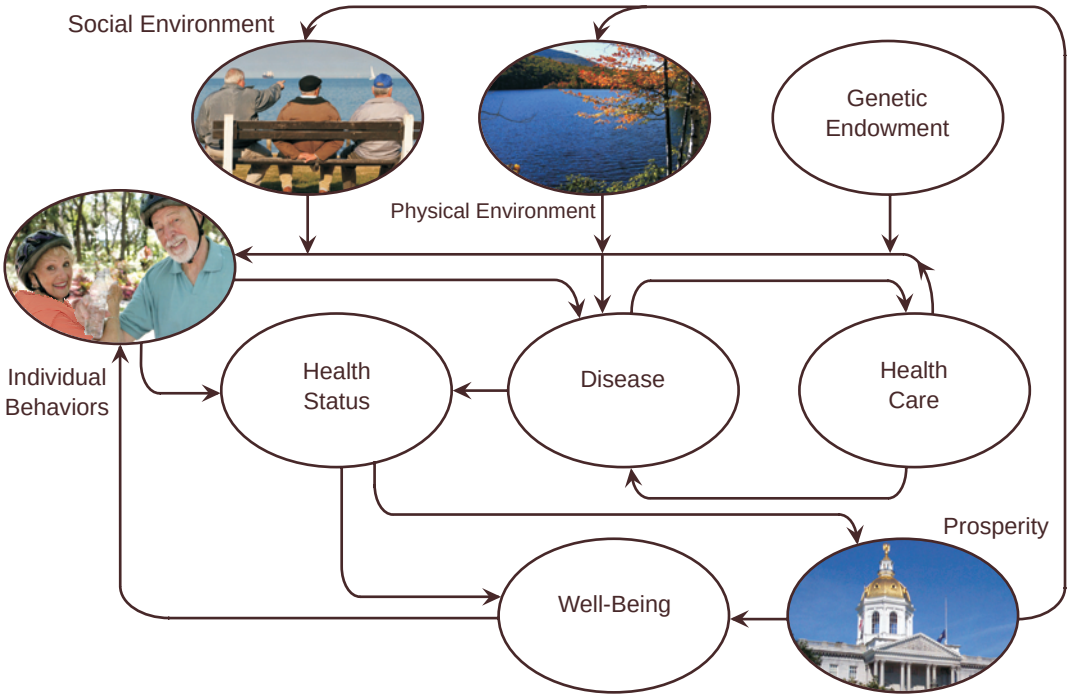
High blood sugar levels impair the circulatory system putting individuals at risk for many serious health conditions including: heart disease, blindness, nerve damage and kidney damage and amputations. The health care costs associated with diabetes are huge. In 2004, approximately $8,700,000 or about 5.5% of all health care expenditures for New Hampshire state government employees were related to diabetes care. [66]

During 1999–2001 diabetes accounted for 4,702 years of potential life lost in New Hampshire (death before the age of 75 years). Most worrisome is that the risk factors for diabetes continue to increase. For example, between 1990 and 2002 there was a statistically significant increase in adults who were overweight (33% in 1990, 38% in 2002) [67].

RISKS TO FUTURE HEALTH

The onset of chronic conditions can be prolonged and some conditions prevented through the adoption of healthy life-style behaviors.

Evans & Stoddard Field Model of Health and Well-Being



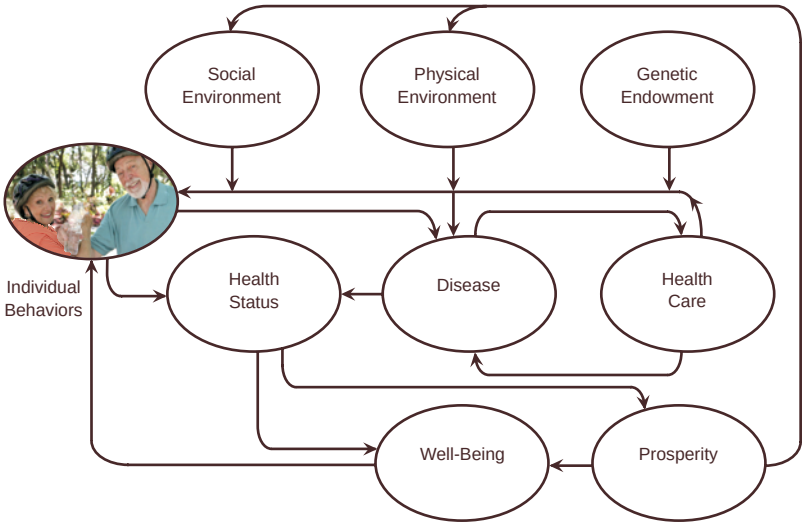
Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

BEHAVIORS

People care about their health and they try in a number of ways to maintain it, to improve it or to adapt to its decline. For example, most people attempt to avoid activities or circumstances that they see as potentially harmful while trying to increase behaviors to enhance their health [10].

Our behaviors are linked to what makes us sick and what kills us. Our behaviors, including behaviors such as smoking, which are associated with poor health outcomes, are strongly influenced by the social and physical environments in which we live [68] and are thus not easily changed by an individual alone. Efforts to change or modify behaviors associated with health outcomes should be supported by communities and by the public health and medical systems of our state.

Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

In regard to building or maintaining a healthy New Hampshire public, behavior change remains a primary goal. In other words, we hope to decrease behaviors associated with poor health and increase behaviors associated with good health. Simple life style habits such as decreasing excessive use of alcohol, not smoking, eating well and exercising regularly to avoid obesity, can have profound effects on our individual health.

Alcohol Use

Alcohol may have health benefits if consumed in moderation, but is also associated with serious health risks.

The U.S. Department of Agriculture and the Dietary Guidelines for Americans defines moderate drinking as no more than one to two drinks per day for men, and no more than one drink per day for women. In moderation, alcohol consumption may benefit the heart and circulatory system.

Conversely, "long-term heavy drinking increases an individual's risk for heart disease and stroke, several forms of cancer, cirrhosis, and other liver disorders and mental health problems. Alcohol use also contributes to a substantial proportion of injuries and deaths related to motor vehicle crashes, falls, fires, drowning and firearms. Alcohol use is often a factor in homicides, suicides, domestic violence and child abuse. Use of alcohol during pregnancy can result in growth and mental retardation and birth defects [11]."

Alcohol use is associated with mental health conditions. Between 1998–2002 alcohol abuse, intoxication, dependency, and withdrawal were among the top 15 mental health disorders related to emergency room hospitalizations [69]. Additionally, alcohol dependency was the most frequent mental health diagnosis at New Hampshire specialty hospitals between 1999–2003 [70].

In 2004, 6% of New Hampshire adults reported heavy drinking (adult men having more than two drinks per day and adult women having more than one drink per day). Two out of every three (66%) of New Hampshire adults reported having at least one drink within the past thirty days. Sixteen percent (16%) of New Hampshire adults had more than five drinks on at least one occasion (this is called binge drinking) [61].

Of the New Hampshire adults who reported episodes of binge drinking, 7% reported driving a motor vehicle within a couple of hours after having five drinks or more in one sitting [71]. In 2004, 35% of highway fatalities were related to alcohol use [44]. Underage alcohol consumption in 2005 cost the state of New Hampshire $180 million when considering the costs associated with alcohol use and youth violence; traffic crashes; high risk sex; property crime; injury; poisoning and psychoses; fetal alcohol syndrome (FAS) among mothers and youth alcohol treatment [72].

Alcohol Use by New Hampshire Teens

On the 2005 Youth Risk Behavior Survey, 44% of New Hampshire teens reported that they drank alcohol during the past month and 63% of those who drank reported episodes of binge drinking (having five or more drinks on one occasion) [47]. However, New Hampshire is close to meeting, or has met, its Healthy New Hampshire 2010 goals for teen alcohol use [47, 48].

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NH 2010 Indicator	1995 Baseline*	2005 Data**	2010 Target***
Increase the percent of youth who report never using alcohol	22%	27%	27%
Reduce the percent of youth who report having used alcohol in the past 30 days	53%	44%	43%

* Youth Risk Behavior Survey (YRBS), 1995 (1999 data were not weighted) [73]
** Youth Risk Behavior Survey (YRBS), 2005 [47]
***Healthy New Hampshire 2010 [11]

Teens in New Hampshire are older when they first try alcohol compared to the past. Teens surveyed in 2005 YRBS were less likely to have tried alcohol before the age of 13 compared to teens surveyed in 1995 YRBS (19% in 2005 vs. 28% in 1995). New Hampshire teenagers are also currently less likely to drink and drive or accept rides with a driver who has been drinking. For example, the percent of New Hampshire teens who reported that they rode in a car with someone who had been drinking decreased from 32% in 1995 to 22% in 2005 [47].

Implications of Alcohol Use

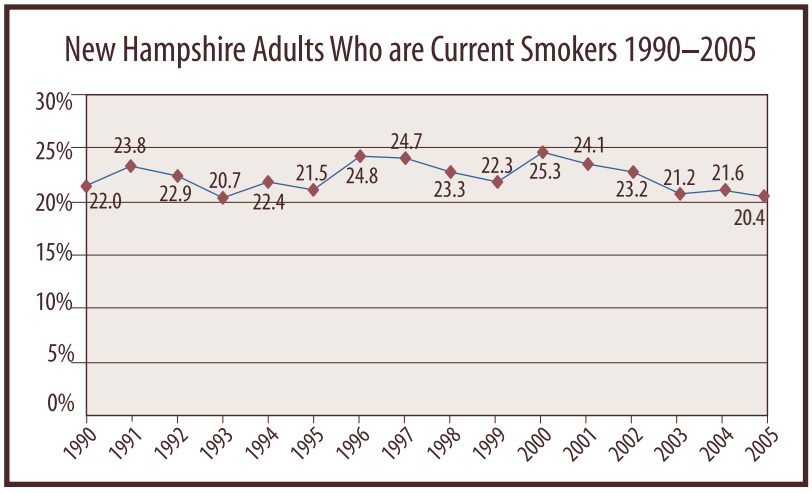
Alcohol abuse and dependence continues to be a major health problem in the United States for adults as well as for teens. About one in thirteen American adults are either alcoholics or abuse alcohol heavily. Major health problems associated with alcohol abuse include damage to the digestive system including the liver, "enlargement of the heart leading to coronary health disease, high blood pressure and psychiatric problems that include irritability, hyperactivity, paranoia and hallucinations" [74]. Drinking alcohol during pregnancy increases the risk of miscarriages, infant death and fetal alcohol syndrome.

Public health programs designed to decrease alcohol abuse are often targeted to teens in collaborative efforts between state and local governments, communities, and local businesses. Research has shown that "40% of children who begin drinking before the age of 15 will become alcoholics at some point in their lives" [75]. Youth who drink before they turn 15 are four times more likely to develop alcohol dependence than those who start drinking at 21 [75]. Additionally, the National Center on Addiction and Substance Abuse (CASA) found that "children who reach the age of 21 without smoking, using illegal drugs or abusing alcohol are virtually certain never to do so" [74].

Smoking

Smoking is a costly habit and is associated with poor health outcomes and early death. The annual average smoking attributable mortality rate for New Hampshire population is estimated to be 1,771 deaths (1,011 males and 760 females) [76]. For both males and females the leading causes of death associated with smoking are malignant neoplasms (cancers), cardiovascular diseases, and respiratory conditions [77].

In 2005, 15.4% of New Hampshire adults reported that they currently smoked everyday, 5% reported that they smoked some days, 29.5% were former smokers and 50.1% had never smoked [78].



Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 1990–2005 [48,79]

In New Hampshire, smoking is more prevalent in younger adults compared to older adults. In 2005, smoking prevalence ranged from 32% among adults aged 18–24 to 8% among adults aged 65 years or older [79].

Smoking Among New Hampshire Teens

In 2005, almost half (46%) of New Hampshire teens (ninth–twelfth graders) reported that they had tried smoking cigarettes and 21% had smoked cigarettes in the past month. About 9% of current teen smokers reported smoking more than 10 cigarettes per day on the days that they smoked.

Although teen smoking remains a public health concern for New Hampshire, teen smoking rates have gone down since 1995 [79]:

- In 1995, 31% of New Hampshire teens reported never having tried cigarette smoking compared to 54% in 2005.
- Additionally, the percent of teens who reported having smoked in the past thirty days decreased from 34% in 1995 to 21% in 2005.

NH not meeting health goals | NH is getting better | NH has met or exceeded goal

NH 2010 Indicator	1995 Baseline*	2005 Data**	2010 Target***
Tobacco			
Increase the percentage of youth who report never having tried cigarette smoking.	31%	54%	43%
Reduce the percentage of youth who report having smoked in the past 30 days.	36%	21%	24%

Source: *Youth Risk Behavior Survey (YRBS), 1995 (1999 data were not weighted) [73]
**Youth Risk Behavior Survey (YRBS), 2005 [47], ***Healthy New Hampshire 2010 [11]

Implications of Smoking

Tobacco use is associated with socioeconomic class. Addiction to tobacco often starts in childhood. Choosing to smoke is not a simple life style choice made by an individual but instead often represents "a powerful form of social conditioning" [2]. Thus, programs to deter smoking need to not only focus on changing individual behaviors, but also must address the political, business, social and physical environments in which individuals live and operate.

Smoking is a costly addiction for the State of New Hampshire and for New Hampshire smokers. Measures from SAMMEC (Smoking-Attributable Mortality, Morbidity, and Economic Costs Computer Software) reported by the CDC State Tracking System for the years 1997–2001 summarize just how costly cigarette smoking is [76]:

- Smoking was associated with substantial premature death, i.e., 23,685 years of potential life lost.
- Smoking was associated with 1,771 deaths on average each year.
- Smoking was associated with high costs to New Hampshire businesses due to productivity loss of $380,837,000.
- In 1998, smoking attributable expenditures (excess personal health care expenditures attributed to diseases where cigarette smoking is a primary risk factor, among adults aged 18 years and older) in New Hampshire included
    - $153,000,000 for ambulatory care,
    - $90,000,000 for hospital care, and
    - $119,000,000 for nursing home care.
- In 2004, the average New Hampshire smoker consumed about 148.4 packs of cigarettes at an average cost per pack of $3.52. Thus, the average cost of smoking to a smoker for that one year was $522.37.

Income, Alcohol Use and Smoking

As illustrated in the table below, New Hampshire residents with higher incomes were more apt to report that they drank alcohol and that they had participated in binge drinking. Conversely, those with lower incomes were more apt to smoke and be at risk for smoking-related illnesses.

Alcohol and Tobacco	Income Level 2005				
	<$15,000	$15,000–24,999	$25,000–34,999	$35,000–49,999	$50,000+
One or more drinks of alcohol in past 30 days	40.2%	49.3%	59.8%	61.6%	75.3%
Binge drinking	12.7%	11.9%	17.7%	13.5%	16.6%
Heavy drinking	4.7%	4.0%	4.5%	5.6%	6.9%
Current smokers	32.5%	33.5%	26.6%	23.9%	14.3%
Never Smoked	38.1%	37.4%	46.5%	45.9%	55.5%

Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [48]

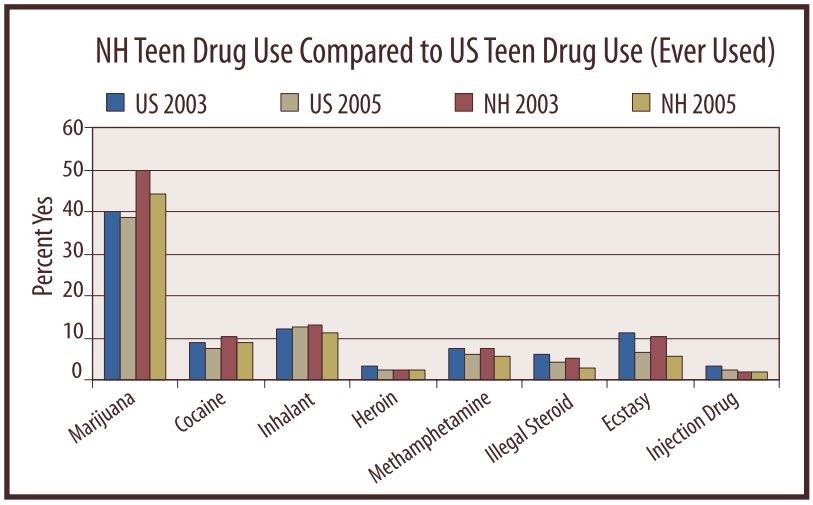
Teen Drug Use

New Hampshire has yet to reach its Healthy New Hampshire 2010 goals for teen drug use. State trends in teen drug use are equivocal at best, most alternating between increasing and/or decreasing from one time period to another. A few trends show no significant changes from one time period to another.

Significant trends of increasing cocaine use (both lifetime and 30-day use) were observed from 1993 to 2005. In contrast, lifetime inhalant, heroin, and methamphetamine use showed no significant changes from 2003 to 2005.

On a positive note, a significant drop in lifetime ecstasy use was observed from 2003 to 2005 (10.3% to 5.5%). Also, the age of initiation for alcohol and marijuana use among teens (used for the first time before thirteenth birthday) decreased from 2003 to 2005 (11.1% to 7.1% for marijuana; 25.8% to 19.3% for alcohol) [47, 73, 79-81].

Marijuana use varied considerably across time periods. In 1995, for example, 56.8% of New Hampshire teens reported that they had never used marijuana. By 2005, the percentage was 56%, essentially no different. However, the percent of teens that reported using marijuana in the past 30 days increased in the years between 1993 and 2005 (20.9% to 25.9%), but a significant reduction occurred between 2003 and 2005 (30.6% to 25.9%) [47, 73, 79-81].



Source: National Center for Chronic Disease Prevention and Health Promotion, Youth Online [82].

Implications of Teen Drug Use

Illicit drug use can be associated with injury, illness, disability, lost productivity, crime, and death [11]. New Hampshire court statistics show that the arrest rate of juveniles for drug crimes is the ninth highest in the country. Drug charges against New Hampshire juveniles rose by 60% between 1996 and 2002 [83]. These data suggest increasing drug problems or increased law enforcement.

Teen Reproductive Health and Sexual Activity

Early and unprotected sex puts teens at risk for sexually transmitted diseases such as Chlamydia or HIV infection and for unplanned pregnancies. While teen rates of sexual activity have not decreased since 1995, the percent of teens using condoms has significantly increased and the rate of births to teens has decreased to below the 2010 target.

NH not meeting health goals | NH is getting better | NH has met or exceeded goal

NH 2010 Indicator	1995 Baseline*	2003 Data**	2005 Data***	2010 Target^
Increase the percentage of 9th through 12th graders who report never having engaged in sexual intercourse.	54%	59%	57%	64%
Increase the percentage of sexually active 9th through 12th graders who report having used a condom during their last sexual intercourse.	52%	56%	65%	61%
Reduce teen births (per 1000 females 15–19 years of age)^^	24	18	No data available	21

Sources: *Youth Risk Behavior Survey (YRBS), 1995 (1999 data were not weighted) [73], **YRBS, 2003 [81], ***YRBS, 2005 [47], ^Healthy New Hampshire 2010 [11], ^^NH Division of Vital Records Administration, NH Department of State [41]

Forty-three percent (43%) of teens who responded to the 2005 New Hampshire YRBS stated that they had had sexual intercourse in their lifetime. Of the teens who reported having had sexual intercourse in their lives, 9% reported having had sex with four or more people and 33% reported having had sex with one or more people during the past three months [47].

Of the teens who had sexual intercourse in the past three months, 19% reported drinking alcohol or using drugs before their last sexual encounter. Less than a third (29%) used birth control pills to prevent pregnancy before their last sexual encounter [47].

Implications of Teen Sexual Activity

Unprotected sexual activity can result in pregnancy and is associated with an increased risk for sexually transmitted diseases, for example, Chlamydia and Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS).

"Teen pregnancy can carry serious consequences. Teen mothers are less likely to get or stay married, less likely to complete high school or college, and are more likely to live in poverty and be dependent on public programs. Infants born to teen mothers are also more likely to suffer from low birth weight [11]." During 1998–2002, there were 3,751 births to teens between the ages of 15–19 years [31].

Chlamydia infection often has no symptoms but might result in serious complications of infertility, ectopic pregnancy, chronic pelvic pain, and cancer. Rates of Chlamydia infection increased significantly among New Hampshire teens between 2003–2004 [84].

Chlamydia and Gonorrhea Cases 2000–2004										
	2000		2001		2002		2003		2004	
	Cases	Rate / 100,000	Cases	Rate / 100,000	Cases	Rate / 100,000	Cases	Rate / 100,000	Cases	Rate / 100,000
Chlamydia (15–24 yrs)	889	571.9	1,089	686.6	1,213	749.8	1,233	748.3	1,354	806.9
Gonorrhea	111	9.3	179	15.1	120	9.9	123	9.9	134	10.5

Source: Health Statistics and Data Management Section of the Bureau of Disease Control and Health Statistics, New Hampshire Department of Health and Human Services [31].

Obesity

What we eat and how much we exercise are associated with whether we are at a healthy weight for our height. Being overweight or obese is associated with poorer health outcomes. Nationally, the number of overweight children increased three fold between 1970 and 2000 [74]. In an effort to reverse this trend, the public health community has focused its improvement efforts on weight control by promoting healthier eating and physical activity. The CDC has also published comprehensive and important health promotion and disease prevention strategies aimed at obesity [74].

Overweight/Obesity

Individuals who are overweight or obese are at greater risk for health conditions and chronic diseases such as hypertension, high cholesterol, Type 2 diabetes, heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea and some cancers. Weight loss can often improve or prevent risk factors for these health issues [85].

The prevalence rates of New Hampshire adults who are obese have risen significantly over the past decade and continue to rise. For example, in 1990 11% [86] of New Hampshire adults were obese compared to 23% in 2005 [87]. For purposes of public health planning, the state defines being overweight or obese using Body Mass Index (BMI) scores, which can be measured with data from the BRFSS and YRBS. BMI scores are used to define ranges of weight that are greater than what is generally considered healthy for a given height, as well as ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems. The BMI is the only measure available to the state for estimating the population prevalence of this health issue and for comparing these rates to those of the rest of the nation.

BMI scores, indicating overweight and obesity, have continued to increase in New Hampshire. Using this measure, we have failed as a state in meeting our 2010 goals for healthy weight for both teens and adults.

■ NH not meeting health goals ■ NH is getting better ■ NH has met or exceeded goal

NH 2010 Indicator	1999 Baseline*	2003 Data	2005 Data	2010 Target*
OVERWEIGHT				
Reduce the prevalence of obesity and overweight in TEENS	Data not available	10%^	11%^^	5%
Reduce the prevalence of obesity and overweight in ADULTS	50%	57%+	60%++	40%

Source: *Healthy New Hampshire 2010 [11].
^ Youth Risk Behavior Survey, 2003 (YRBS) [81].
^^ Youth Risk Behavior Survey, 2005 (YRBS) [47].
+ Behavior Risk Surveillance Survey, 2003 (BRFSS) [88].
++ Behavior Risk Surveillance Survey, 2005 (BRFSS) [87].

Implications of Being Overweight or Obese

The prevalence of overweight and obesity in children in New Hampshire may likely be associated with an increased prevalence of obesity-related health issues in the future adult population [89].

Overweight and obesity are associated with poorer quality of life for individuals as well as with an adverse effect on longevity. For example, the National Health and Nutrition Examination Survey reported that the prevalence of diabetes was 2.9 times higher in overweight persons compared to those not overweight [89]. Additionally, obese males, regardless of smoking habits, have a higher mortality from cancer of the colon, rectum, and prostate; and obese females have a higher mortality from cancer of the gallbladder, biliary passages, breast (postmenopausal), uterus (including both cervix and endometrium) and ovaries.

The health problems associated with overweight and obesity have a significant economic impact on the nation and the state due to the need for enhanced prevention, diagnostic and treatment services, as well as the loss of income by individuals due to decreased productivity, restricted activity, absenteeism and bed days [85]. For example, in a recent research study it was reported that the estimated adult medical expenses attributable to obesity in New Hampshire between 1998–2000 was $302 million [90].

"How to prevent obesity is no secret—a combination of physical activity and wise choices in nutrition can have an immediate impact on weight and foster long-lasting healthy behavior. Reduced weight helps prevent diabetes and cardiovascular disease and other health threats caused by being overweight [74]."

Diet

Dietary factors are associated with increased health risks and play a prominent role in five out of the ten leading causes of death for Americans. Eating a healthy and balanced diet can also help individuals maintain their weight which helps prevent diabetes and cardiovascular disease as well as other health problems.

A dietary goal that has been actively supported by public health is to increase the public's consumption of fruits and vegetables. However, in New Hampshire there has been no improvement on this 2010 indicator over the past six years and the prevalence of obesity continues to increase.

NH not meeting health goals NH is getting better NH has met or exceeded goal

NH 2010 Indicator	1999 Baseline*	2003 Data**	2005 Data^	2010 Target*
DIET AND NUTRITION				
Increase the percent of ADULTS who consume five or more servings of fruits and vegetables daily	28%	29%	29%	50%

Source: * Healthy New Hampshire 2010 [11].
** Behavioral Risk Factor Surveillance Survey (BRFSS), 2003 [91].
^Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [92].

Physical Activity

Increasing physical activity can reduce the risk for type 2 diabetes, heart disease, stroke, and some cancers, and can improve bone, joint and muscle strength. Physical activity can also reduce feelings of depression, anxiety and stress and help achieve and maintain a healthy weight.

About 44% of New Hampshire adults and 57% of New Hampshire students did not meet the minimum standards for physical activity as measured by their responses on the 2005 Behavioral Risk Factor Surveillance Survey for adults [93] and the 2005 Youth Risk Behavior Survey for students [47].

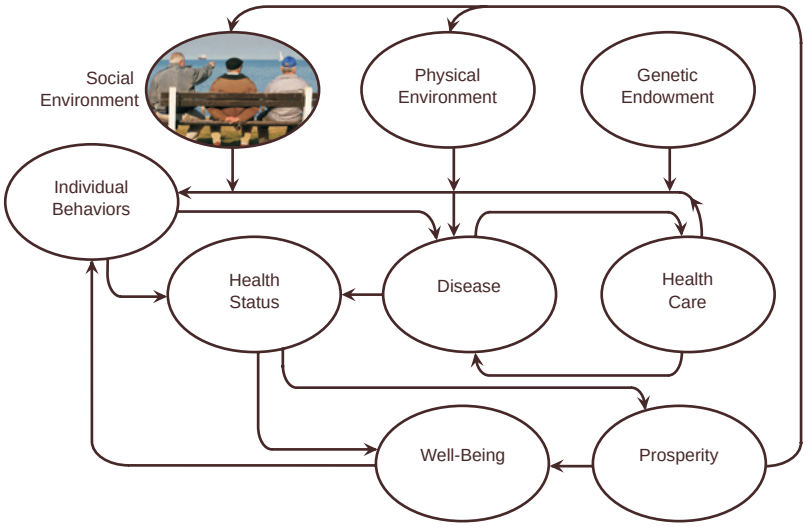
The CDC states that "there is no demographic or social group in America that could not benefit from becoming more active," and suggests that participating in even moderate-intensity physical activity for 30 minutes a day, five days a week is a vital component of a healthy lifestyle for adults of all ages and abilities. Children and adolescents should participate in at least 60 minutes of moderate-intensity physical activity most days of the week.

You can achieve the benefits of physical activity by incorporating walking and other forms of activity into daily routines and work schedules. The list below provides suggestions of daily activities that contribute to meeting the physical activity recommendation:

- Take the stairs instead of the elevator.
- Park your car at the far end of the parking lot or farther from your destination; an easy way to add steps in to your day.
- Use your lunch break to take a walk.
- Replace 30 minutes of TV time with a 30-minute walk.
- Mow the lawn with a push mower or rake leaves.
- Walk your child to school.
- Play active games with children (tag, hide-n-seek, charades).
- Walk the dog.
- Get support—ask a friend, family or co-worker to join you for a walk.

SOCIAL ENVIRONMENT

Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

Our social environments influence our behaviors and our health. The table below illustrates how the selected social factors of family structure, education, social networks, social class, work setting and prosperity impact health.

Social Environment	
Construct	Health Impact
Family Structure	Family structure is associated with children's physical and mental health.
Educational System	On average, those with more formal education live longer.
Social Networks	On average, those with more social contacts live longer.
Social Class	There is a clear relationship between social class and life expectancy after adjusting for smoking and income.
Work Setting	Involuntary unemployment negatively affects mental and physical health.
Level of Prosperity	Economic prosperity is associated with better health.

Source: Institute of Medicine, 1997 [10]

Family Structure

Children who live in families with poor economic, social and family circumstances are more likely to have poor nutrition, poorer physical development, and lower educational attainment. These factors may raise the risk for poor socio-economic circumstances in adulthood, poor skill attainment, unemployment and unhealthy lifestyle behaviors such as smoking, lack of exercise and poor eating habits. Children raised in poor family circumstances may also develop low self-esteem and poor coping skills. Both of these factors are associated with poorer health status in adults [94]. Family structure is changing in New Hampshire, and this will have an impact on the future health of our population. From 2000 to 2004, New Hampshire has seen a consistent rise in the percent of children (from 26% to 31%) who live in single parent households (which may or may not be important depending on whether the households are associated with poorer material means), and a rise in the percent of children who are living in households in which no parent has held a full-time year round job during the past year (from 24% to 33%). Thus, public health might want to focus attention particularly on these children who are being brought up in difficult family circumstances—circumstances which will make it harder for them to maximize their potential health in the future.

Education

On average, people who attain a higher level of education live longer. It is thought that higher educational attainment results not only in the ability to obtain better jobs and higher standards of living which are related to better health, but also results in the development of better coping skills, confidence and self-esteem, which have also been shown to be related to better health and longer life.

In New Hampshire, we see that educational level is associated with perceived health status (those with higher educational levels were more apt to state that their health was excellent, very good, or good) and with better health habits (those with higher educational levels were more apt to exercise and less apt to smoke).

Perceived Health and Health Habits	Educational Level 2005			
	Less than H.S.	H.S. or G.E.D.	Some Post-H.S.	College Graduate
Health is excellent, very good, or good	73%	85%	89%	95%
Not obese or overweight	40%	46%	46%	59%
Participated in physical activity in the past month	60%	70%	81%	86%
Never smoked or former smoker	62%	71%	79%	90%
Consumed 5 or more servings of fruits and vegetables per day	21%	24%	29%	34%

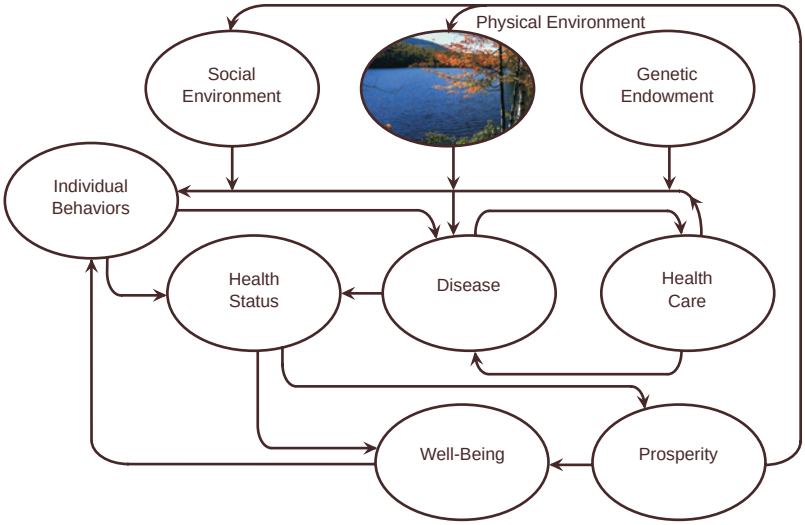
Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [95]

Social Networks and Social Class

Social capital describes the basic building blocks of community which are: trust, involvement and connections. These building blocks are strongly associated with the health of community populations. Data from the Social Capital Community Benchmark Survey [96] gave New Hampshire communities high marks for their level of social capital. The survey results clarified that in New Hampshire, residents trust each other and feel that no matter their social status or "class" they are able to be equally involved in the civic life and leadership in their communities. Although research has been able to identify clearly the impact of social networks and social class on health, "the pathways responsible for those effected are not yet known" [10].

PHYSICAL ENVIRONMENT

Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

"The interaction between people and their environments, natural as well as human-made, continues to emerge as a major issue concerning public health [97]."

Our physical environment is the water, land, and air that surround us, as well as the buildings in which we live and work. Health conditions and events that can be associated with environmental exposures include heart attack, cancer, chronic and acute respiratory disorders, injury, poisoning, as well as other chronic and acute diseases. Environmental health issues discussed in this section are childhood lead poisoning; air quality and asthma; and radon exposure and lung cancer.

Childhood Lead Poisoning

Childhood lead poisoning is a significant, preventable environmental health problem. In 2005, 215 New Hampshire children under the age of six were newly identified with elevated blood lead levels (10 micrograms/deciliter or greater). These children are likely to suffer developmental delays, learning disabilities and behavioral problems as a result of their exposure to lead.

Children aged six months to six years are particularly at risk for lead poisoning due to developmental behaviors (e.g. hand-to-mouth behavior, crawling) and physiology. Living in housing built before 1978, when lead-based paint was banned from residential use, is the most important risk factor for lead poisoning. The older a home, the more likely it is to contain lead paint. Almost 65% of New Hampshire's housing was built before 1978 [98]. Deteriorating paint (chipping, flaking, and peeling) and paint disturbed during home remodeling contributes to lead dust, contaminates bare soil around a home, and makes paint chips and dust containing lead accessible to children. Finally, low income is a risk factor for lead poisoning because it is associated with substandard housing, inadequate diet, as well as barriers to health care and education.

Confirmed Elevations		
Year	Percent*	Number
2001	1.7%	227
2002	1.8%	259
2003	2.0%	275
2004	1.9%	283
2005	1.5%	215

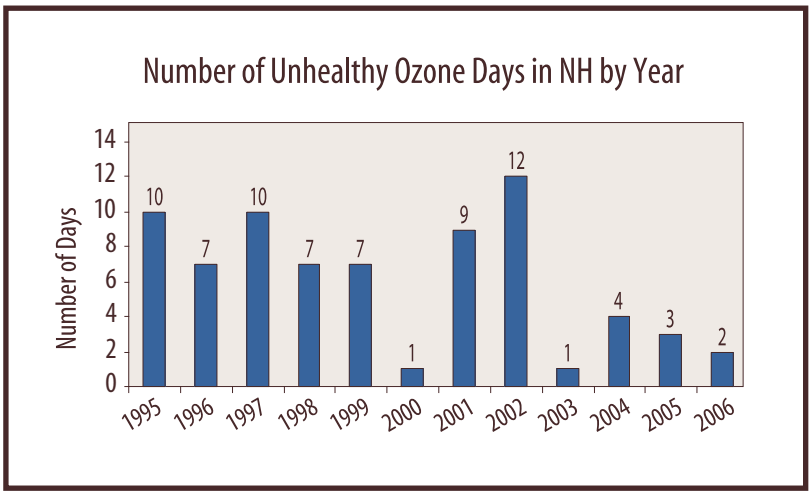
Source: NH Childhood Lead Poisoning Prevention Program [99
*Confirmed Elevations/Total Children Screened (Age <6)]

Implications of Childhood Lead Poisoning

Lead is a heavy metal that enters our homes and workplaces via old paint dust, burning fossil fuels, mining, and manufacturing. Lead is highly toxic to humans, especially young children. Lead can damage a child's developing nervous system, kidneys, bone marrow, and other body systems. At very high levels, lead poisoning can lead to coma, convulsions, and death. Levels as low as 10 micrograms of lead per deciliter of blood are associated with impaired cognitive function and behavior difficulties, and can cause reduced intelligence, impaired hearing and reduced stature [100]. Recent studies show that even blood lead levels below 10 micrograms/deciliter can be associated with decreased IQ [101] and cognitive deficits [102].

Air Quality and Asthma

Asthma is a chronic respiratory disease that currently afflicts 10.3% of New Hampshire adults and 10.7% of New Hampshire children [95]. Acute asthma attacks can be triggered by indoor and outdoor air pollutants and allergens. The outdoor air pollutant most commonly linked to asthma attacks is ozone—a colorless gas formed when emissions from cars, power plants, and other sources react chemically in the presence of sunlight. Most of New Hampshire's elevated ozone events occur in summer months when Southerly winds transport ozone-forming pollutants from major metropolitan and industrial areas located south and west of the state [103].



Source: New Hampshire Department of Environmental Services [104]

Asthmatics are particularly susceptible to the effects of ozone, which can cause asthma attacks both directly and indirectly. Asthma attacks can result directly from ozone-induced irritation and reduced lung function in the respiratory system. Ozone also increases sensitivity to allergens, which are the most common triggers for asthma attacks. (Allergens come from dust mites, cockroaches, pets, fungus, and pollen).

Implications of Air Pollution and Asthma

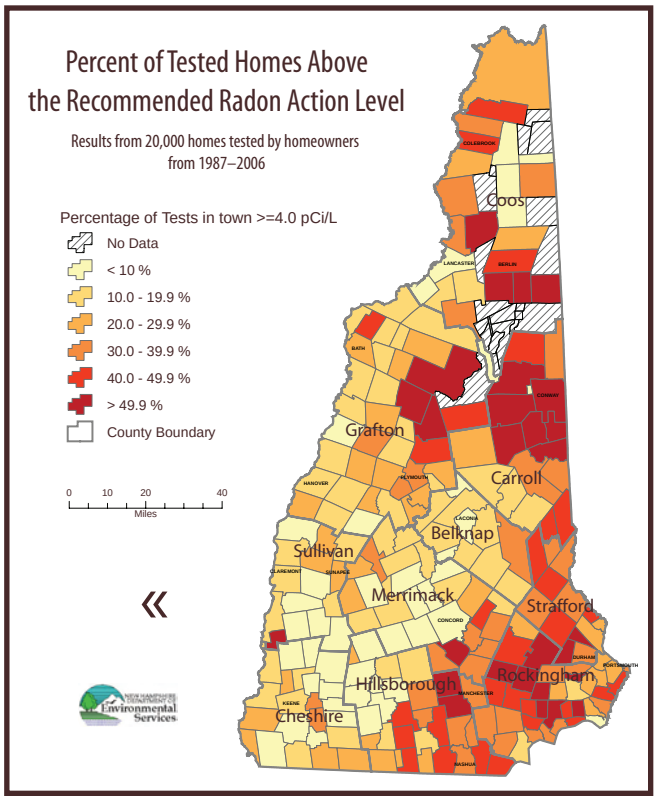
Studies show that unhealthy ozone days can result in 30% more asthma-related emergency room visits than usual [105]. In 2004, asthma-related hospitalization costs in New Hampshire were $3.9 million for emergency room visits and $8.2 million for inpatient stays [106]. Reducing asthma-related emergency room visits could have an effect on both inpatient and emergency room costs, because the majority of inpatient stays originate in the emergency room.

Radon Exposure and Lung Cancer

Radon is a naturally occurring radioactive gas that emanates from rocks and soils. It becomes a human health hazard when it accumulates in high concentrations in indoor air. Long-term exposure to high levels of radon in homes can cause lung cancer [107, 108].

Many or most radon-related lung cancers can be prevented with simple and relatively inexpensive radon mitigation technology. Radon testing is particularly important to New Hampshire residents because the "Granite State" has higher-than-average radon exposure potential. The average indoor radon concentration nationally is 1.25 picocuries per liter (pCi/L). In New Hampshire, it is about 1.8 pCi/L. US EPA has established 4.0 pCi/L as the level at which radon mitigation should take place. In New Hampshire, more than 30% of homes tested were above 4 pCi/L.

In many New Hampshire towns, more than 50% of homes tested were above the EPA action level of 4 pCi/L (dark red in map below). In others, it's less than 10% (light yellow).



Source: NH Radon Program, Department of Environmental Services [109].

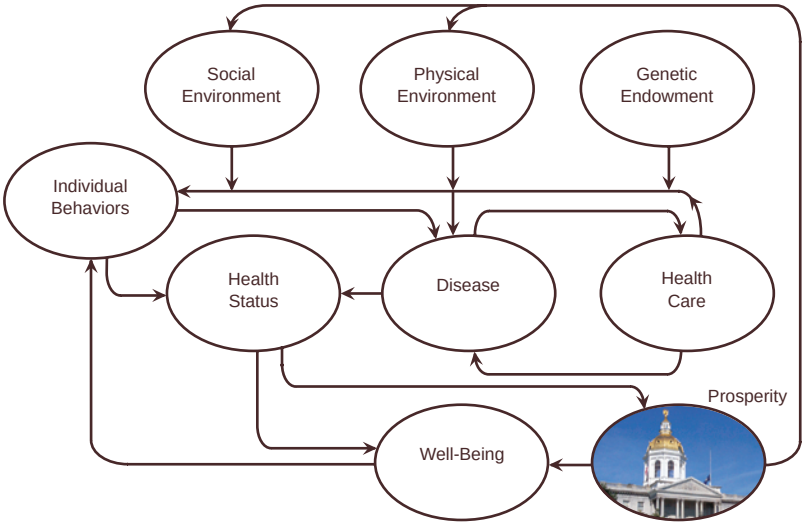
Implications of Radon and Lung Cancer

It is estimated that radon causes about 14% of all lung cancer deaths, including about 26% of lung cancer deaths among non-smokers. In New Hampshire, this means that of the 670 lung cancer deaths that occur each year, between 90 and 100 are due to radon exposure. Many or most of these deaths can be prevented with simple and relatively inexpensive radon mitigation technology [29].

PROSPERITY

It is well known that poverty is associated with poorer health, more disease and lower life expectancy [68]. However, what is not as well known is that health is associated with relative income, which is the level of an individual or group's income in relationship to those around them. For example, in an often cited research study it was reported by Richard Wilkinson that "for every decile, quintile, or quartile of income, from lowest to highest, there was a decline in overall age-adjusted mortality" [10].

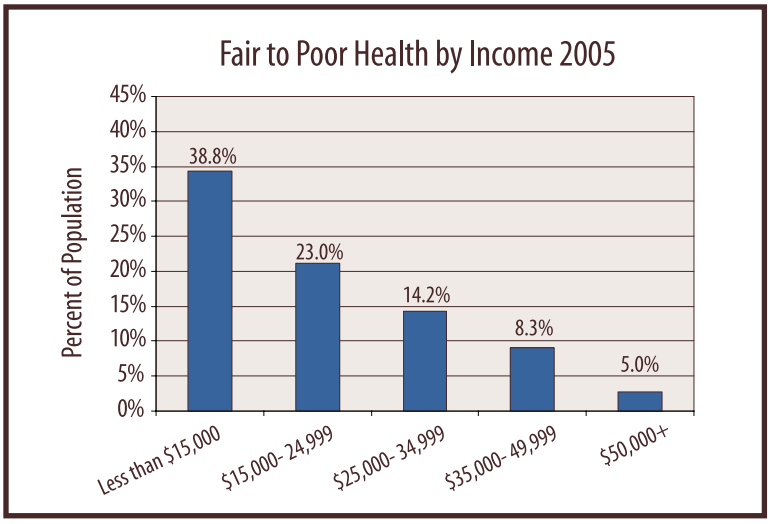
Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

The health of individuals is affected by their health care and by other factors. One important factor that influences health is economic prosperity.

The figure below illustrates the gradient effect across income levels and their association with perceived health status for New Hampshire residents. Specifically, for every decreasing category of income in 2005, there is an increase in the percent of the population who reported that their health was fair to poor. For example, about 5% of the survey respondents who had incomes of $50,000 or higher said that their health was fair to poor compared to 8.3% of those with incomes between $35,000–$49,000, 14.2% of those with incomes between $25,000–34,999, 23% of those with incomes between $15,000–24,999 and 38.8% of those with incomes less than $15,000.



Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [34]

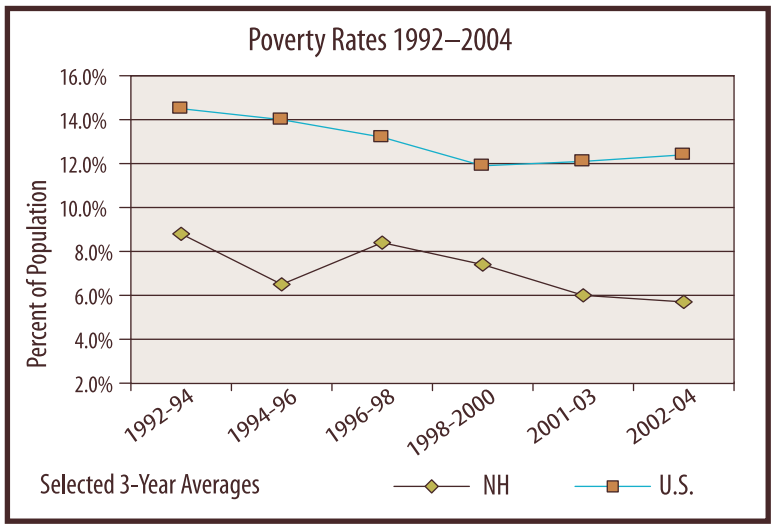
The association between health status and prosperity is not just confined to the poor, but has implications for all individuals depending on where we are in relationship to others in our community and state. One important implication of this information for health planning is that efforts to raise "average" incomes as a means of improving health status may not result in improved population health if the increase in income is concentrated only among a small number of individuals who may already be at the top of the income scale. Additionally, if everyone's income was raised by some common standard we could still expect to see disparities in health outcomes across levels of prosperity.

Who Are the New Hampshire Poor?

"Poverty, relative deprivation and social exclusion have a major impact on health and premature death, and the chances of living in poverty are loaded heavily against some social groups [68]."

In the United States, the poverty rate increased in 2001–2003 for the first time since 1993 largely due to increases in the percent of children now living in poverty (12.9 million American children living in poverty in 2003). The U.S. poverty rate differs by age as well as by race and ethnicity. A higher percentage of Black or African American and Hispanic persons of all ages live in poverty compared to Whites [110]. Poverty rates in the U.S. are expected to continue to increase over the next five years [21].

The percent of New Hampshire residents living in poverty has consistently been lower than the U.S. average and has been decreasing for the past ten years. According to the 2000 census, 6.5% of New Hampshire residents had an income below the poverty level [111]. Most notably, 7.3% of New Hampshire's children, 7.2% of New Hampshire's elders (residents 65 years of age and older) and 4.3% of New Hampshire's families are poor [111].

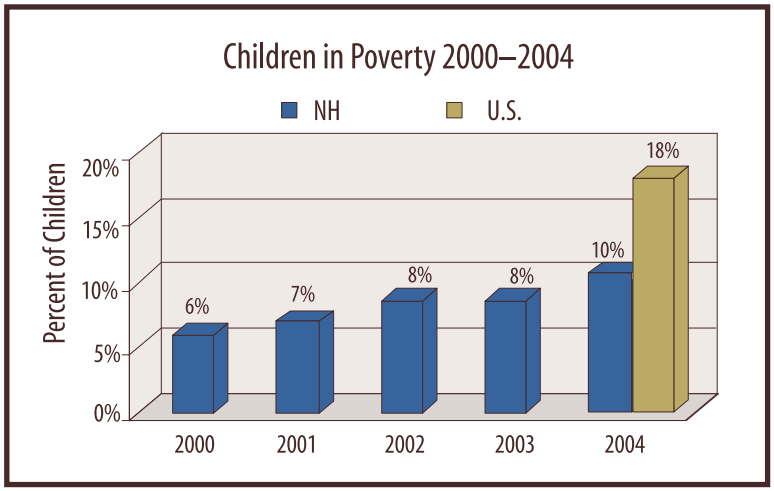


Source: Institute for Research on Poverty [110]

Children and Poverty

"Children and adults in families with incomes below or near the federal poverty level have poorer health outcomes than those with higher incomes. Although in some cases illness can lead to poverty, more often poverty can cause poor health by its connection with inadequate nutrition, substandard housing, exposure to environmental hazards, unhealthy lifestyles, and decreased access to and use of health care services [21]."

Although overall poverty rates and rates of children living in poverty in New Hampshire are low compared to the rest of the U.S., New Hampshire's poverty rates for children have been rising consistently since 2000 (6% of New Hampshire's children were living at or below 100% of poverty in 2000 compared to 10% in 2004) [112].



Source: The Annie E. Casey Foundation [112]

Race and Ethnicity are Associated with Lower Incomes

Minority populations living in New Hampshire tend to have higher average incomes compared to minority populations who live in other parts of the U.S. However, Black or African Americans, Asians, and Hispanics, as well as other minority populations who live in New Hampshire, have lower average incomes compared to Whites. Thus, we would expect them to also have lower health status scores.

Census 2000 Per Capita Income by Race/Ethnicity		
	NH	US
Per Capita Income	$23,844	$21,587
White (Non-Hispanic)	$24,120	$23,918
Black or African American	$17,041	$14,437
Asian	$21,538	$21,823
Hispanic or Latino	$14,476	$12,111

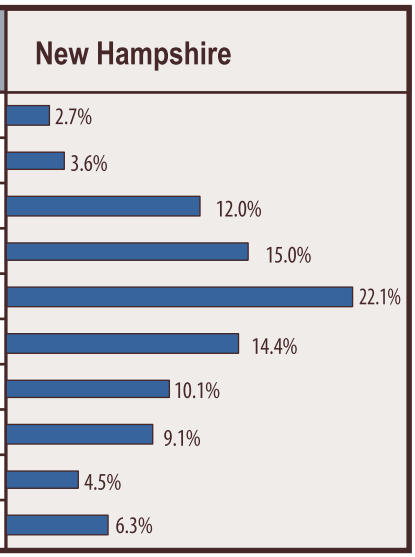
Source: U.S. Census, 2000 [111].

Implications of Prosperity on the Health and Welfare of New Hampshire Residents

Unemployment rates in New Hampshire are lower on average than those of New England and the U.S. (4.3% in New Hampshire, 5.1% in New England and 6.0% across the U.S., 2003) [113]. Additionally, the median household income of New Hampshire's households is higher on average than that of U.S. households ($55,580 in New Hampshire compared to $44,684 for the U.S., 2004) [31]. Thus, on these two measures of prosperity New Hampshire does very well.

However, even though New Hampshire enjoys relative abundance in respect to employment and income, the overall rate of unemployment in New Hampshire had increased from 2.8% in 2000 to 4.3% in 2003 [113] and almost 20% of New Hampshire households had an income of less than $25,000 [31].

Median Household Income 2004	NH	NH %	US %
$200,000 or more	13,413	2.7%	2.7%
$150,000 to $199,999	17,917	3.6%	2.9%
$100,000 to $149,999	59,195	12.0%	9.4%
$75,000 to $99,999	73,936	15.0%	11.1%
$50,000 to $74,999	108,552	22.1%	19.0%
$35,000 to $49,999	70,851	14.4%	15.5%
$25,000 to $34,999	49,798	10.1%	12.0%
$15,000 to $24,999	44,662	9.1%	12.3%
$10,000 to $14,999	22,088	4.5%	6.3%
Less than $10,000	31,177	6.3%	8.9%

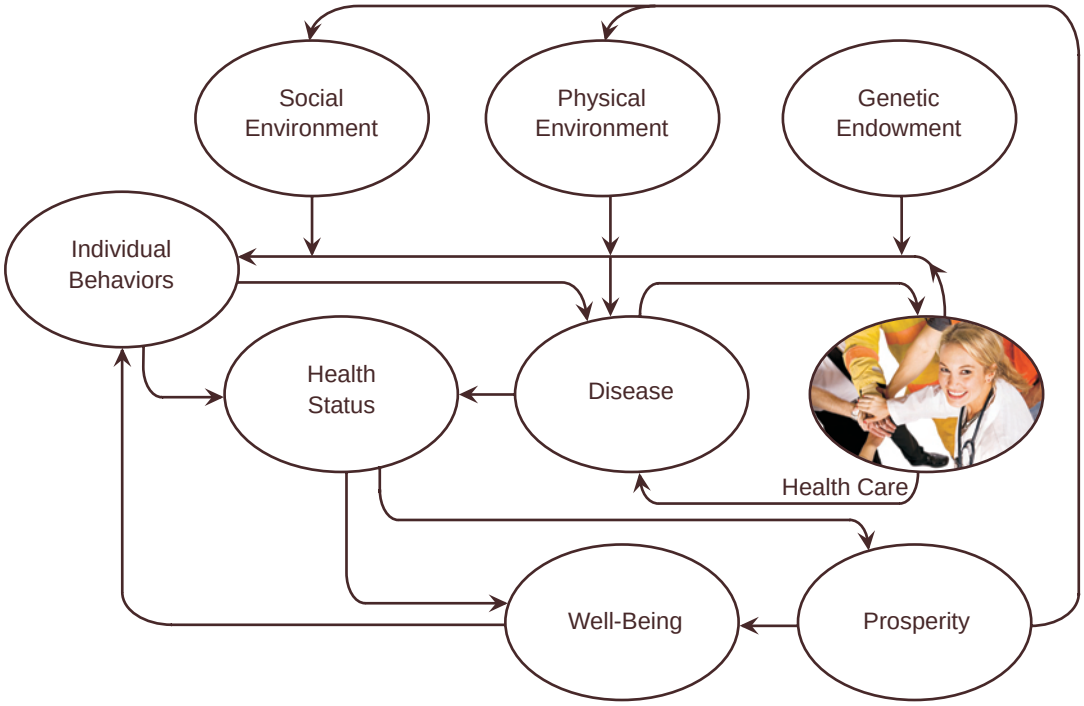


Source: Health Statistics and Data Management Section of the Bureau of Disease Control and Health Statistics, New Hampshire Department of Health and Human Services [31].

Thus, should the state determine that enhancing prosperity was a long-term public health goal, it might focus its efforts on decreasing the disparities in income levels that exist in the state (e.g., 6.1% of households have incomes of $150,000 or greater while 6.3% of households have incomes less than $15,000). Additionally, the state might work toward a goal of 100% employment at jobs that provided households a living wage as well as benefits such as health insurance.

HEALTH CARE

Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

In New Hampshire, having access to health care services through insurance is associated with income, education, race and ethnicity.

Access

We all need access to appropriate health care services. Access to health care through insurance can be the key for being able to obtain treatment or preventive care in a timely fashion so that this care has the most impact on preventing adverse health outcomes.

Forty-six million Americans do not have health insurance and many more have insurance with limited benefits [52]. In New Hampshire, 11% of the population (2003–2004), or 141,110 people did not have health insurance. Of those who had insurance, 67% had employer-sponsored coverage, 3% had individual coverage, 12% were on Medicare and 6% were on Medicaid [114].

"While most Americans are able to get the care they need, people who are sicker, have lower income, have less education, and who do not have health insurance are more likely to delay care or fail to get care altogether because they cannot afford it [52]."

Behavioral Risk Factor Surveillance Survey 2004 Indicator	% for those Uninsured	% for those Insured
Percent unable to see a doctor when needed due to cost in the past 12 months	43%	6%
Percent without a personal doctor or health care provider	47%	9%
Percent who report "poor" or "fair" health status	15%	7%
Percent of women age 40–64 who have not had a mammogram in the past two years	50%	18%
Percent of women age 18–64 who have not had a Pap Smear in the past three years	25%	9%
Percent of men age 40–64 who have not had a PSA test in the past two years	80%	56%
Percent of adults 50–64 who have not had a blood stool test in the past two years	83%	65%
Percent of adults 50–64 who have not had a sigmoidoscopy or colonoscopy	62%	41%

Source: State-by-State Report on Access to Care, State Health Access Data Assistance Center [114].

About 90% of New Hampshire residents who responded to the 2005 BRFSS reported that they did have health insurance [115]. However, as illustrated by the table below, having health insurance is associated with income and education.

Access to Health Care	Do you have any kind of health care coverage (Yes) 2005				
EDUCATIONAL LEVEL	Overall	Less than H.S.	H.S. or G.E.D.	Some H.S.	College graduate
	90%	73%	86%	89%	95%

INCOME LEVEL	Overall	<$15,000	$15,000–24,999	$25,000–34,999	$35,000–49,999	$50,000+
	90%	81%	77%	83%	88%	96%

Source: Behavioral Risk Factor Surveillance Survey (BRFSS), 2005 [115].

Although there are limited data on health insurance access by race and ethnicity for New Hampshire residents, a 2004 Hillsborough county survey indicated that insurance access for racial and ethnic minorities may be lower than that for Whites, e.g., 63% of African Americans and 38% of Latinos in the Hillsborough sample reported having health insurance [116]. This questionnaire included standard BRFSS questions.

Implications of Cost on Access

The rising costs of health care creates barriers to access not only to acute medical intervention, but also to preventive services which protect the public from poor health outcomes in the future, for example: vaccines, colonoscopies, complete preventive care for diabetes, treatment for depression, and medicines to prevent additional heart attacks.

Costs of health care services continue to rise nationally and in the state and affect everyone's ability to gain access to the preventive and acute medical services that they need. Because health and health care are fundamental to the well-being and security of the public, the rising costs of health care and the subsequent impact of these costs on access has become a public health concern.

Many factors have influenced this rise in health care costs including our increased use of medical technology, our complex administrative systems, and system waste and redundancy:

- Nationally, it is estimated that on average in 2004 we spent about $6,400 per person on health care and this spending is projected to increase to $11,000 per person by 2014 [52].
- In New Hampshire, it was reported that we spent about $5,158 per person in 2000 on personal health care for a defined set of services, that we would spend about $7,539 per person for the same services in 2005 and about $10,670 per person by 2010 [117].

The high costs of health care premiums and services affect our life choices, our quality of life and our ability to access health care services when we need them [52]:

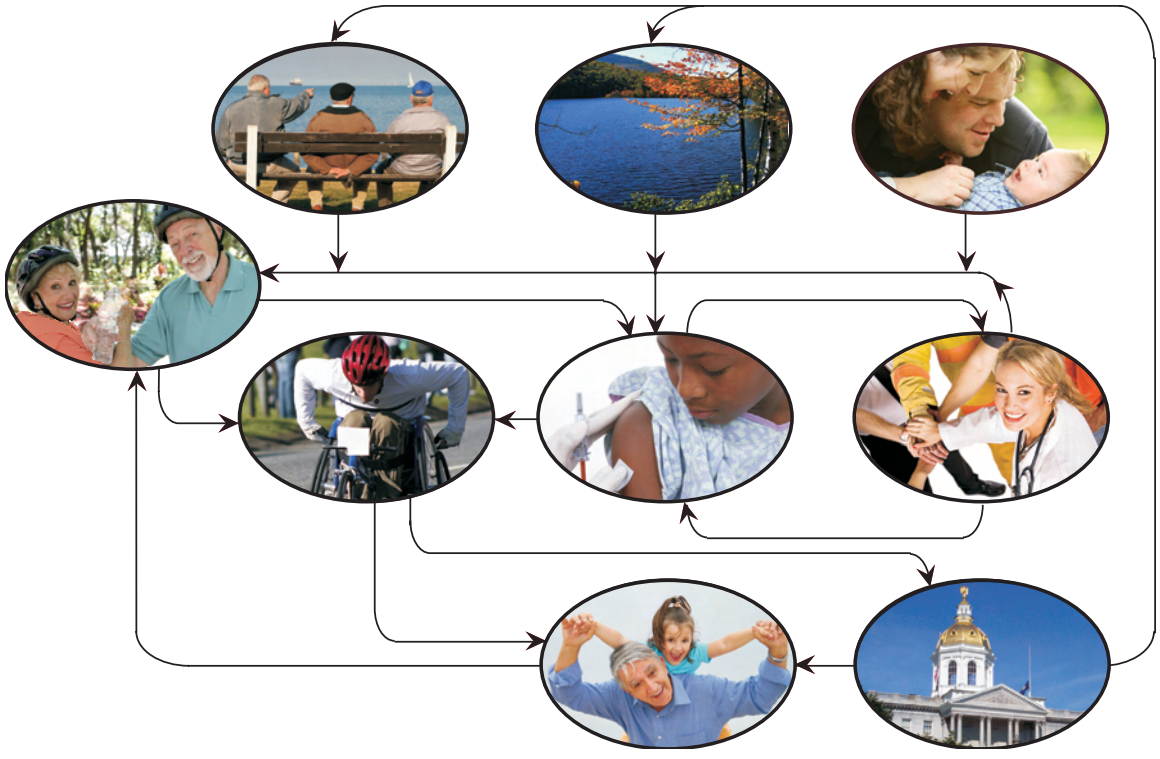
- Some workers cannot afford to purchase health insurance even when it is offered by their employer.
- Some workers postpone retirement in order to keep employer-based insurance.
- Some mothers choose to work in order to pay for health insurance.
- Some people choose not to start their own businesses because they would not be able to afford the high costs of health care premiums.

FUTURE CHALLENGES

"There is growing recognition that individuals, communities, and various social institutions can form powerful collaborative relationships to improve health that government alone cannot replicate."

(Institute of Medicine, 1997 [10])

Evans & Stoddard Field Model of Health and Well-Being

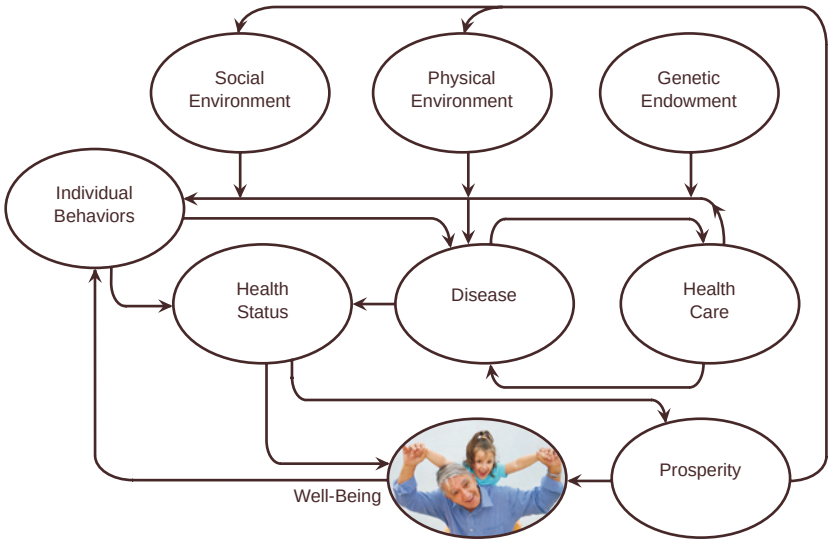


Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

MAINTAINING WELL-BEING

"Well-being is the sense of life satisfaction of the individual [2]," which is or should be, the ultimate objective of New Hampshire's health policy.

Evans & Stoddard Field Model of Health and Well-Being



Source: Adapted from *Why Are Some People Healthy and Others Not?* RG Evans, ML Barer, and TR Marmor, 1994. [2]

During the past ten years on national polls, New Hampshire has been ranked as either the first, second, third, or fourth healthiest state in the nation [3,9]. These rankings are based on the average score of twenty-one indicators which summarize general health outcomes (births, deaths, disease), the health system (access and capacity), and health behaviors (drinking, smoking, exercise).

Because these national polls incorporate important indicators of health from each of the determinants of our health model, these scores might be thought of as an overall proxy measure for the general well-being of the state's population. Based on these limited number of indicators, New Hampshire residents seem to be healthy and seem to have a better sense of well-being compared to residents of other states.

However, as the data in this report indicate, there is a lot of work for the state's public health system to do to maintain the gains that it has made in producing a relatively healthy population, to improve the health of those who have not yet reached their full potential for health and to prepare for new and future challenges to the public's health.

Thus, in an effort to deal with the current challenges of maintaining the well-being of residents who are doing well and improving the health and well-being of those who are not—while also preparing for future public health challenges or crises (e.g., the prevalence of new infectious diseases such as Avian Flu or SARS and the rising threat of bioterrorism)—New Hampshire must work in partnership with community and state leaders and continue to invest in improving its public health system.

ASSURING A HEALTHY PUBLIC NOW AND IN THE FUTURE

"Only a public health system supported by political will, public and private partnerships, and other financial resources can meet ongoing and new health challenges [74]."

The Need for Collaboration

In 2003, the Institute of Medicine (IOM) published a report that assessed the nation's public health capacity. In this report, the IOM recommended that public health systems across the nation become more closely aligned and integrated with partners in both the public and private sectors to create a more integrated public health system. The IOM stated clearly that "government has a unique responsibility to promote and protect the health of the people built on a constitutional, theoretical and practical foundation. However, government public health agencies alone cannot assure the nation's health. There is growing recognition that individuals, communities, and various social institutions can form powerful collaborative relationships to improve health that government alone cannot replicate [1]."

The Institute of Medicine presented five major recommendations for developing integrated public health systems. These have and will serve as an important framework for New Hampshire as it works to assure a healthy public now and in the future:

1. Adopt a population health approach that considers multiple determinants of health.
2. Strengthen government's public health functions, the backbone of the public health system.
3. Develop new partners across sectors, requiring accountability in the process.
4. Make decisions based on evidence.
5. Enhance communication within this public health system.

Adopt a Population Health Approach That Considers Multiple Determinants of Health

Several factors present challenges to the state's current and future public health system and medical infrastructure. Some New Hampshire residents—by virtue of their disease status, health behaviors, and/or socio-economic status—are not as healthy today as they could be. The state's population is growing, becoming more diverse and is aging. Additionally, the health and security of the public is no longer independent from that of others throughout the world. The increasing global interconnectedness of economies, environments, governments, and cultures has presented and will continue to present new challenges to our state, e.g., protecting the public from potential acts of bioterrorism.

In order to address these internal and external challenges more effectively, the state will need to further develop its ability to monitor the health of the state's population across multiple determinants of health such as those used in this report:

- Improve infrastructure and ensure the availability of resources necessary for collection, analysis and dissemination of quality public health data.
- Improve data quality of essential Vital Records (birth and death data), hospital (ambulatory, specialty, and inpatient), and survey data sets (BRFSS, YRBS, and others).
- Improve access to population-based real-time data sources, such as emergency department (ED), emergency medical services (EMS), and trauma center data.
- Develop innovative procedures to report data based on small numbers and rare events.
- Further develop GIS mapping resources and the capacity to analyze spatial data.
- Make public health data and data analysis more accessible to individuals and communities by sharing appropriate data and analysis on a web page.
- Continue to strengthen collaborative efforts to define, develop and make available meaningful standard community health profiles based on appropriate use of available data.
- Make town-level population estimates and projects readily available down to the year, gender, and age group levels.
- Develop new data sources to better assess New Hampshire health, especially population-based surveys to better access health behaviors.

A comprehensive, flexible and responsive data system, developed to collect and analyze real-time data will aid the state in being able to improve the health of its current population and respond to emergent and new health challenges. Such a system will also provide the data and part of the communication infrastructure needed by the state to respond to any acts of bioterrorism.

Essential Public Health Functions

1. Monitor health status to identify community health problems.
2. Diagnose and investigate health problems and health hazards in the community.
3. Inform, educate, and empower people about health issues.
4. Mobilize community partnerships to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and ensure safety.
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable.
8. Assure a competent public health and personal health care workforce.
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services.
10. Conduct research to attain new insights and innovative solutions to health problems.

Source: Pfizer Inc's Public Health Group, Milestones in Public Health, 2006 [74]

Strengthen Government's Public Health Functions, the Backbone of the Public Health System

The New Hampshire Department of Health and Human Services (DHHS) has focused their planning and resources on enhancing their capacity to implement essential public health functions defined by a steering committee chaired by the Assistant Secretary of Health and Surgeon General.

Develop New Partners across Sectors, Requiring Accountability in the Process

During the past several years, DHHS has developed new partners within the state to enhance its ability to improve the health of the public. The New Hampshire Public Health Network (NHPHN) and the All-Hazard Regions (AHR) are two examples of collaborations designed to expand the state's impact on population health and security.

The New Hampshire Public Health Network (NHPHN)

The NHPHN assures coordinated and comprehensive delivery of essential public health services and serves as a local liaison with state agencies involved in the public's health and safety. NHPHN is comprised of community-based partnerships encompassing broad public health interests of local health departments and health officers, fire, police, emergency medical services, health care providers, social service agencies, schools, media and advocacy groups, and leaders in business, politics and faith. New Hampshire began funding community partnerships in 2000 to improve local public health capacity throughout the state. Currently, there are 14 public health partnerships serving nearly 50% of New Hampshire towns and 70% of New Hampshire residents.

All-Hazard Regions (AHR)

The New Hampshire Department of Health and Human Services (DHHS) is the state agency responsible for providing technical assistance and guidance to local communities so that they are fully prepared to prevent and properly respond to emergencies. Thus, DHHS has been working for several years in collaboration with other state agencies to develop specific guidelines and policies for the prevention and management of Public Health Emergencies. Through this planning process, DHHS convened a Pandemic Preparedness Coordinating Committee which established that regional public health and pandemic planning efforts be distributed to regions known as All-Hazards Regions (AHR). Regional Coordinating Committees were formed to oversee these planning efforts. These committees coordinate the development and implementation of all public health emergency planning in each AHR in New Hampshire.

The state must continue to support the development of these types of partnerships in an effort to create a more sophisticated public health infrastructure that is able to respond to on-going public health needs of local populations as well as to any future crises that might arise at the local level.

Make Decisions Based on Evidence

In June of 2005, DHHS published a summary of their performance management approach in a report entitled *Improving the Public's Health in New Hampshire* [118]. This report describes the commitment that the Division of Public Health Services has made to actively use data to inform their decisions for developing, improving and continuously monitoring the effectiveness of New Hampshire's public health programs.

Successfully implementing a continuous quality improvement process within the framework of the state's public health system will require a strong data infrastructure as well as commitment from all public health partners in the state including local health departments, public health networks, community health centers, community health agencies, community action programs, community coalitions, public schools, AIDS services organizations, hospitals, visiting nurse agencies and family resource centers.

Enhance Communication within the Public Health System

The 21st century presents a new set of challenges to the nation's health. Whether confronting bioterrorism attacks, emerging infections, lifestyle behaviors, disparities in health status, or increases in chronic disease and injury rates, the public health community now more than ever needs a strengthened infrastructure including a state-of-the-art communication system between public health and the public [74].

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