The Division for Heart Disease and Stroke Prevention developed policy and system outcome indicators across the priority areas of the National Heart Disease and Stroke Prevention Program. The indicators are specific, observable, and measurable characteristics that show the progress being made toward achieving outcomes. This comprehensive set of indicators can be used for program planning and evaluation by state Heart Disease and Stroke Prevention programs as well as their partners.
DRAFT Policy and System Outcome Indicators for Controlling High Cholesterol

Division for Heart Disease and Stroke Prevention

November 2009
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1. INTRODUCTION

1.1 Purpose

The Centers for Disease Control and Prevention’s (CDC’s) Division for Heart Disease and Stroke Prevention (DHDSP) developed policy and system outcome indicators for state Heart Disease and Stroke Prevention (HDSP) programs and partners across program priorities. Program Managers, Evaluators, and DHDSP are the primary intended users of the indicators and supporting materials. State HDSP programs are funded to support policy and system change that will lead improvements in five priority areas across priority settings. State work focuses on adults with high blood pressure or high blood cholesterol with emphasis on the healthcare and worksite settings.

Indicators are specific, observable, and measureable characteristics that show the progress a program is making toward achieving outcomes. This document provides outcome indicators for controlling high cholesterol in adults with high cholesterol. Each indicator includes a scaled rating based on existing science, expert opinion, and state practices. The work is intended to assist with program planning and evaluation and:

- Provide a solid evidence base for public health decision making.
- Describe outcome indicators for evaluation of state HDSP programs, and suggest appropriate data sources and measures for these indicators.
- Encourage states to use valid and reliable measurement methods and comparable data sources.
- Help DHDSP determine evaluation criteria, assess best practices, and provide consistent surveillance and evaluation technical assistance to states.

This indicator book includes:

- A brief summary of the state of the science for logic model components and how it relates to downstream components.
- A logic model to identify causal pathways across the outcome components. (Appendix 1)
- Indicator rating tables that list all of the indicators associated with each component of the logic model and the synthesized expert reviewer ratings for each indicator.
- Indicator profiles that include detailed information for each indicator including example data sources/measures.
- Data source descriptions are provided for sources related to more than one indicator. (Appendix 2) The data source descriptions provide background information on the source and where the source can be located.
Throughout the Controlling High Cholesterol Indicators book, the term “high cholesterol” refers to high blood cholesterol, not high dietary cholesterol. High blood cholesterol occurs when there is too much cholesterol in your body and it is deposited in arteries, including those of the heart, which can lead to narrowing of the arteries and to heart disease.

1.2 Methods

The Social-Ecological Model, first described by McLeroy, Bibeau, Steckler, & Glanz (1988), provides a framework in which to develop, implement, and evaluate comprehensive interventions. The model describes society as interconnected elements—individual, interpersonal, organizational, community, and social—that affect one another. The model support the premise that in order to change individual behavior, a comprehensive intervention should consider how all these levels of influence can be addressed to support long-term, healthful lifestyle choices. The Social-Ecological Model informed the logic model for Controlling High Cholesterol and the indicators span the dimensions. State Heart Disease and Stroke Prevention Programs are charged with working at the Societal and Community levels of the Social Ecological Model through policy and systems changes. Because working at these higher levels is intended to ultimately impact individual knowledge, awareness, and behavior change, outcomes that reflect these individual-level changes have been included in the Controlling High Cholesterol Indicators, though working directly with individuals is not within the scope of the HDSP Program.

The indicators were identified through an extensive review of the literature which supported the development of a logic model for policy and systems change to control high cholesterol. Each outcome indicator is nested within a component of the logic model (Exhibit 1 and Appendix 1). Indicators were linked across the logic model to downstream outcomes based on published findings. The indicators were then reviewed and rated by a panel of experts that included state health department managers and epidemiologists, content area experts, and CDC experts.
Exhibit 1 – Controlling High Cholesterol Logic Model

Inputs

Box 1 Healthcare System Changes:
- Adherence
- Efficiency
- Policies/Protocols/Tools

Box 2 Provider Changes:
- Awareness
- Adherence to Guidelines

Box 3 Workplace Changes:
- Policies/Protocols/Tools
- Environmental Changes

Box 4 Community Changes:
- Environmental Changes
- Policy/Legislative Changes

Activities

Box 5 Individual Changes:
- Awareness
- Knowledge

Outputs

Box 6 Risk Factor Reduction Through Lifestyle and Therapeutic Intervention

Box 7 Reduced Levels of High Cholesterol

Box 8 Increased Control of Cholesterol Levels Among Individuals with High Cholesterol

Box 9 Reduced Mortality and Morbidity Due to Heart Disease and Stroke

Box 10 Reduced Levels of Disparities in Heart Disease and Stroke

Box 11 Reduced Costs Associated with Heart Disease and Stroke:
- Individual
- Healthcare
- Employer
- Societal

Contextual Factors

- Socio-economic and demographic characteristics of the target population
- Participating organizations' policies and practices
- Healthcare industry practice trends and policies
- Partnerships among patients, providers, healthcare organizations, and worksites
1.3 Use

The outcome indicators are intended to assist in planning and outcome evaluation of heart disease and stroke prevention activities. To facilitate use, the indicators and supporting materials have been written to allow flexibility to tailor measurement to the specific strategies and needs of programs.

State HDSP programs may use the indicators to support the development of an evaluation plan as described in *Evaluation Guide: Developing an Evaluation Plan* published by the CDC Division for Heart Disease and Stroke Prevention, State Heart Disease and Stroke Prevention Program and available at http://www.cdc.gov/dhdsp/state_program/evaluation_guides/pdfs/evaluation_plan.pdf.

The HDSP Evaluation Guide identifies eight steps in developing an evaluation plan:

1. Develop evaluation questions (what do you want to know?).
2. **Determine indicators** (what will you measure? what type of data will you need to answer the evaluation question?).
3. Identify data sources (where can you find these data?).
4. Determine the data collection method (how will you gather the data?).
5. Specify the time frame for data collection (when will you collect the data?).
6. Plan the data analysis (how will data be analyzed and interpreted?).
7. Communicate results (with whom and how will results be shared?).
8. Designate staff responsibility (who will oversee the completion of this evaluation?).

State HDSP programs can use the logic model, indicator ratings and profiles to select a set of outcome indicators to include in their evaluation plan:

- **Logic model box summaries** provide a very brief overview summarizing the state of the science for the given outcome component and identify how it relates to downstream components. As HDSP programs consider evaluation needs, reviewing this information will identify critical causal pathways across the outcome components that should be measured. Once these causal pathways are identified, HDSP programs may want to select one or more indicators from each identified outcome component to ensure a strong evaluation plan.

- **Indicator rating tables** list all of the indicators associated with the outcome component of the logic model and the synthesized expert reviewer ratings for each indicator by criterion. HDSP programs may want to select criteria most suited to the context of the program and most important to stakeholders. Once
the criteria are selected, programs can use this information to help select relevant outcome indicators.

- **Indicator profiles** include detailed information for each indicator including potential data sources and how to measure indicators. This information may provide a starting point for addressing Step 3 in the Evaluation Plan development, “Identify data sources.” HDSP programs, however, will need to carefully consider a number of relevant issues before final selection of measures can occur, including at what level data should be collected; whether the data source to be used is valid, reliable, and feasible given the context; and the periodicity of data collection.

2. **EXPERT PANEL INDICATOR RATING TABLES**

The rating table lists the indicators, by logic model box, and summarizes the expert panel ratings for each indicator. The indicators were rated on criteria that describe five important characteristics of a “good” indicator and overall quality of the indicator. Availability of an existing data source was not a criterion for selection of the indicators or a rated criterion. Rating tables can be used to quickly review the indicators to identify those with specific criteria, for example, indicators with the highest scientific validity or as a quick reference to review all the indicators and their relationships.

The criteria are:

- **Overall quality** — a summary rating that reflects expert reviewer opinion of the overall quality of the indicator.

- **Resources needed** — rating of the amount of funds, time, and effort needed to collect reliable and precise data on the indicator and to analyze primary or secondary data. The value denotes a qualitative rating of the resources rather than a specific amount or range of costs.

- **Strength of the scientific evidence** — extent to which expert reviewers believe that the literature supports the use of the indicator for HDSP program evaluation; the assumption that implementing interventions to modify an upstream indicator will result in measurable downstream effect.

- **Face validity** — expert reviewer estimation of the extent to which judgments about and measurement of the indicator would appear valid and relevant to policy makers and other decision makers who use the results of an evaluation to justify their continued support.

- **Utility** — extent to which expert reviewers believe that the indicator would help to answer key HDSP program evaluation questions.

- **Conformity with accepted practice** — expert reviewer opinion of the degree to which use of the indicator is consistent with currently accepted HDSP practice.
<table>
<thead>
<tr>
<th>Indicator Name and Number</th>
<th>Overall Quality</th>
<th>Resources Needed</th>
<th>Scientific Evidence</th>
<th>Face Validity</th>
<th>Utility</th>
<th>Accepted Practice</th>
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<tr>
<td>2.1.1 Proportion of healthcare systems with policies that identify LDL cholesterol as the primary target of lipid-lowering therapy</td>
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<td>![Face Validity]</td>
<td>![Utility]</td>
<td>![Accepted Practice]</td>
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<tr>
<td>2.1.2 Proportion of healthcare systems with electronic medical records appropriate for treating patients with high cholesterol</td>
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<td>![Face Validity]</td>
<td>![Utility]</td>
<td>![Accepted Practice]</td>
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<tr>
<td>2.1.3 Prevalence of specialized chronic care clinics with a focus on high cholesterol</td>
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<td>$$</td>
<td>![Face Validity]</td>
<td>![Utility]</td>
<td>![Accepted Practice]</td>
<td></td>
</tr>
<tr>
<td>2.1.4 Proportion of healthcare systems with treatment algorithms that incorporate recommendations of current evidence-based cholesterol guidelines</td>
<td>![Low to High Scale]</td>
<td>$$</td>
<td>![Face Validity]</td>
<td>![Utility]</td>
<td>![Accepted Practice]</td>
<td></td>
</tr>
<tr>
<td>2.1.5 Number of quality improvement initiatives to increase practitioner adherence to current evidence-based cholesterol guidelines</td>
<td>![Low to High Scale]</td>
<td>$$</td>
<td>![Face Validity]</td>
<td>![Utility]</td>
<td>![Accepted Practice]</td>
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<tr>
<td>Indicator Name and Number</td>
<td>Overall Quality</td>
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<td>2.1.6 Proportion of healthcare systems with policies to follow up with patients tested for high cholesterol</td>
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<tr>
<td>2.1.7 Proportion of healthcare systems with policies to increase patient adherence to high cholesterol treatment (including lifestyle modification and pharmacologic components)</td>
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</table>

†† Denotes low agreement among reviewers, defined as less than 75% of valid ratings being within two points of the median for overall quality of the indicator.
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<thead>
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<th>Resources Needed</th>
<th>Scientific Evidence</th>
<th>Face Validity</th>
<th>Utility</th>
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<td>Indicator Name and Number</td>
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<td>2.2.6 Proportion of patients with high cholesterol who receive provider-initiated recommendation and follow-up of therapeutic lifestyle modifications</td>
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<td>2.2.7 Proportion of providers who counsel patients with high cholesterol on how to take prescribed medicines</td>
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<td>2.2.8 Proportion of providers who work with patients to identify cholesterol self management goals</td>
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† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within one point of the median for this criterion.
‡ Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
## Section 2 Indicator Rating Tables

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<td><strong>low ← → high</strong></td>
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<tr>
<td>2.3.4 Proportion of worksites with environmental supports to control high cholesterol</td>
<td><img src="image" alt="Rating" /></td>
<td>&quot;$&quot;</td>
<td>□</td>
<td>□</td>
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<td><img src="image3" alt="Rating" /></td>
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<td><img src="image3" alt="Rating" /></td>
<td><img src="image4" alt="Rating" /></td>
<td><img src="image5" alt="Rating" /></td>
</tr>
<tr>
<td>2.4.3 Number of community environmental supports to control high cholesterol</td>
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<td>$$</td>
<td><img src="image2" alt="Rating" /></td>
<td><img src="image3" alt="Rating" /></td>
<td><img src="image4" alt="Rating" /></td>
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<td>2.4.4 Proportion of community-based organizations that are linked to health care and public health systems to support control of high cholesterol</td>
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</tr>
<tr>
<td>2.5.1 Proportion of adults who know their cholesterol level(s)</td>
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<td>$$$$</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
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<tr>
<td>2.5.2 Proportion of adults who have had their cholesterol checked within the previous five years</td>
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<td>$$$$</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
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<td>low → high</td>
<td>$$$$</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
</tr>
<tr>
<td>2.5.4 Proportion of adults who know which therapeutic lifestyle behavior changes are associated with controlling high cholesterol</td>
<td>low → high</td>
<td>$$$$</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
</tr>
<tr>
<td>2.5.5 Proportion of adults who are aware of their personal risk associated with high cholesterol</td>
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<tr>
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<td>low → high</td>
<td>$$$$$$</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
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</tr>
</tbody>
</table>
2.5.7 Average annual out-of-pocket costs associated with therapeutic lifestyle modification for the treatment of high cholesterol

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**Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.**
### Indicator Name and Number

<table>
<thead>
<tr>
<th>Indicator Name and Number</th>
<th>Overall Quality</th>
<th>Resources Needed</th>
<th>Scientific Evidence</th>
<th>Face Validity</th>
<th>Utility</th>
<th>Accepted Practice</th>
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<tr>
<td>2.6.1 Proportion of adults who follow a recommended diet to reduce their high cholesterol</td>
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<td>$$</td>
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<td>2.6.2 Proportion of adults with high cholesterol who participate regularly in physical activity</td>
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<td>![Utility Level]</td>
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<td>2.6.4 Smoking prevalence among adults with high cholesterol</td>
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<td>2.6.5 Proportion of smokers with high cholesterol who have made a quit attempt using proven cessation methods</td>
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<td>$$</td>
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<td>![Utility Level]</td>
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<td>2.6.6 Degree of disparity in risk factors for high cholesterol between general and priority populations</td>
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<td>$$</td>
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<td>Face Validity</td>
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<td>2.6.7 Proportion of adults with high cholesterol who adhere to cholesterol-lowering medication regimens</td>
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<td>2.6.8 Degree of disparity in adherence to cholesterol-lowering medication regimens between general and priority populations</td>
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* Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within one point of the median for this criterion.
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<td>2.7.3 Average triglyceride level among adults with high cholesterol</td>
<td>low → high</td>
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<td>2.7.4 Average total cholesterol level among adults with high cholesterol</td>
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† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within one point of the median for this criterion.

†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
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<td>2.8.3 Proportion of adults diagnosed with high cholesterol who have Non-HDL cholesterol at or below goal as defined by current evidence-based guidelines</td>
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<td>2.8.4 Proportion of adults diagnosed with high cholesterol who have total cholesterol level at or below goal as defined by current evidence-based guidelines</td>
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<tr>
<td>2.9.1 Proportion of adults with high cholesterol who have an elevated 10-year cardiovascular risk</td>
<td>![Bar Graph]</td>
<td>$$</td>
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<tr>
<td>2.9.2 Proportion of adults with high cholesterol who have poor quality of life</td>
<td>![Bar Graph]</td>
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<td>2.9.3 Prevalence of nonfatal cardiovascular events associated with high cholesterol</td>
<td>![Bar Graph]</td>
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<td>2.9.4 Death rate due to cardiovascular disease associated with high cholesterol</td>
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## Indicator Rating Tables

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<td>2.10.2 Degree of disparity in cardiovascular mortality associated with high cholesterol between general and priority populations</td>
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## Section 2 – Indicator Rating Tables

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<td>2.11.1 Average annual employer costs attributable to high cholesterol and related health outcomes</td>
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<tr>
<td>2.11.2 Average annual outpatient costs attributable to high cholesterol and related health outcomes</td>
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<td>2.11.3 Average annual inpatient costs attributable to high cholesterol and related health outcomes</td>
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This document is for internal use of State HDSP Programs.
Not for dissemination.

November 2009
3. THE SCIENCE AND INDICATOR PROFILES

Indicators are organized and presented by short-term, intermediate, and long-term logic model box. For each logic model box, a brief summary of the science supporting the indicators is provided followed by a profile of each indicator. The indicator profiles provide detailed information about each indicator. The profiles include:

**Rating** — Summary ratings provided by the expert reviewers. The symbols used correspond to median reviewer ratings for each criterion.

**Indicator Name and Number** — Each indicator has been assigned a unique three-part number.
- The first number identifies the priority area (2 = Controlling High Cholesterol)
- The second number identifies the outcome component of the logic model
- The third number identifies the specific indicator within the component (Figure 1)

**Priority Area** — The title of the priority area.

**Logic Model Component** — The title of the associated outcome component.

**What to Measure** — A description of what to measure when employing the indicator for outcome evaluation.

**Why This Indicator is Useful** — A brief rationale statement is provided for using the indicator as a measure of the outcome component.

**How to Measure** — Example data sources, surveys, or methodologies for collecting information relevant to the indicator are provided. Although some of the proposed data sources/measures are able to provide pertinent information at the state level, others are not. Additionally, depending on the context and scope of state strategies, evaluation of state program activities may require using a given measure or data collection methodology in a more targeted way, for example, within a single county or healthcare system. The example data sources, surveys, and measures information is provided as an initial suggestion. Appendix 2, Data Source Descriptions, has descriptions of each data source or survey listed.

**Population Group** — The population group for which data relevant to the indicator are most commonly collected, if applicable.
**Comments** — Additional information pertinent to measuring the indicator and/or to the example data source. At times, suggestions regarding collecting, analyzing, and reporting data are noted.

**Other Information** — As needed, illustrative examples of elements included under the pertinent indicator.

**References** — A small subset of citations relevant to the indicator.

---

**Figure 1 – Indicator Number Designation**

**Priority Area**

1 = Controlling High Blood Pressure

2 = Controlling High Cholesterol

**Logic Model Box**

1 = Healthcare System Changes
2 = Provider Changes
3 = Workplace Changes
4 = Community Changes
5 = Individual Changes
6 = Risk Factor Reduction
7 = Reduced Levels of High Cholesterol
8 = Increased Control of Cholesterol Levels
9 = Reduced Morbidity and Mortality
10 = Reduced Levels of Disparities
11 = Reduced Costs

The above example is the first indicator in Box 1 of the logic model outcomes for Controlling High Cholesterol, Healthcare System Changes.
LOGIC MODEL BOX 1:  Healthcare System Changes

Healthcare system interventions have been found to be effective in improving detection and control of high blood cholesterol and improving adherence to treatment regimens or practice guidelines. Cholesterol-reduction interventions in healthcare settings deliver programs for specific populations, such as patients at risk for cardiovascular disease, through organization-focused (i.e., changing the policies or guidelines within an institution), provider-focused (i.e., changing physician practices), and/or patient-focused efforts (i.e., influencing individual behavior change). Healthcare systems include multiple provider entities including hospitals, long-term care facilities, other institutional providers and programs, physician practices, and/or organizations with insurance functions (such as managed care organizations).

The Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III), 2001 offers clinical guidelines for care. Efforts to facilitate application of these guidelines in clinical practice serve to improve the quality of care and enhance prevention of heart disease and stroke. The high cholesterol control indicators presented here have been strongly influenced by the Adult Treatment Panel III (ATP III) guidelines.

Evidence suggests that patients who do not achieve ATP III cholesterol goals are at significantly higher risk for cardiovascular events (Stanek et al., 2007). Therefore, it is critical that healthcare systems work to ensure adherence to evidence-based clinical guidelines. Examples of organization-focused interventions to promote adherence to guidelines include: (1) implementing policies that identify LDL cholesterol as a primary target; (2) utilizing computerized systems for patient management; (3) implementing lifestyle modification programs within healthcare settings; and (4) establishing clinics specific to disease management and prevention (Bijlani et al., 2005; Brown & Cofer, 2000; Kinn et al., 2001; McLeod et al., 2005; Pujia, 2002; Robinson et al., 2000).

Computerized system supports have been widely used in healthcare settings for improved service delivery. Specifically, computerized protocols in healthcare settings have been shown to improve adherence to treatment regimens among patients and improve cholesterol control (Schectman, Wolff, Byrd, Hiatt, & Hartz, 1996; Shaffer & Wexler, 1995). There is both direct and indirect evidence that the use of electronic medical record systems is associated with improvement in high cholesterol management through improvement in health information exchange among patients, providers, and healthcare systems (Kinn et al., 2001; Lester, Grant, Barnett, & Chueh, 2006). Additionally, lipid management interventions delivered through specialized clinics have successfully helped individuals reach individual LDL-lowering goals (Brown & Cofer, 2000). These interventions entail a three-
pronounced approach including a predefined system referring patients to effective treatments; patient support to achieve individualized goals; and provider feedback on patient performance.

The short-term outcome indicators for controlling high cholesterol in the healthcare setting are:

2.1.1 Proportion of healthcare systems with policies that identify LDL cholesterol as the primary target of lipid-lowering therapy

2.1.2 Proportion of healthcare systems with electronic medical records appropriate for treating patients with high cholesterol

2.1.3 Prevalence of specialized chronic care clinics with a focus on high cholesterol

2.1.4 Proportion of healthcare systems with treatment algorithms that incorporate recommendations of current evidence-based cholesterol guidelines

2.1.5 Number of quality improvement initiatives to increase practitioner adherence to current evidence-based cholesterol guidelines

2.1.6 Proportion of healthcare systems with policies to follow up with patients tested for high cholesterol

2.1.7 Proportion of healthcare systems with policies to increase patient adherence to high cholesterol treatment (including lifestyle modification and pharmacologic components)

References


### Proposed Indicator

**Proportion of healthcare systems with policies that identify LDL cholesterol as the primary target of lipid-lowering therapy (2.1.1)**

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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Short-term Outcomes Box 1 – Healthcare System Changes: Adherence, Efficiency, Policies/Protocols/Tools

### What to Measure

Proportion of healthcare systems with policies that focus clinical efforts on LDL cholesterol as the primary target of lipid-lowering therapy.

### Why This Indicator is Useful

Elevated LDL cholesterol is a major cause of cardiovascular heart disease (Executive Summary of the Third Report of the NCEP, 2001). Several studies have shown that lowering LDL cholesterol can significantly reduce the risk of coronary heart disease (Olsson, 2006). A greater percentage of patients of healthcare clinics that routinely document LDL cholesterol level (71%) met their LDL goals than did patients of healthcare systems less likely to document patients’ LDL-cholesterol level (11%) (Brown & Cofer, 2000).

### How to Measure

TO BE DETERMINED

### Population Group

Healthcare systems

### Comments

Evaluators may want to assess whether the healthcare system has existing policies related to LDL cholesterol as the primary target of lipid-lowering therapy. Evaluators may also choose to gather data on the size and demographics of the population affected by the relevant policies.

### Other Information

If applying the indicator within a single healthcare system, the indicator will simply denote the presence or absence of the given policy.

### References


Executive Summary of The Third Report of The National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, And Treatment of High Blood Cholesterol In Adults (Adult Treatment


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<tr>
<th>Proposed Indicator</th>
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**Priority Area**  
Controlling High Cholesterol

**Logic Model Component**  
Short-term Outcomes Box 1 – Healthcare System Changes: Adherence, Efficiency, Policies/Protocols/Tools

**What to Measure**  
Proportion of healthcare systems that use medical records and related decision prompts to enhance the provision of high cholesterol care according to clinical guidelines.

**Why This Indicator is Useful**  
Effective use of information and medical technology is one of the strategies the Institute of Medicine (2001) recommended to improve the quality of care in the United States. Use of electronic medical records (EMR) has been shown to significantly increase LDL documentation, the number of patients on lipid-lowering medications, and the incidence of patients achieving LDL levels of $<100$ mg/dl (Kinn et al., 2001). Furthermore, flagging patients who may be candidates for cholesterol treatment can significantly increase statin prescriptions (Lester et al., 2006; Whitley et al., 2006).

**How to Measure**  
TO BE DETERMINED

**Population Group**  
Healthcare systems

**Comments**  
In addition to tracking care provided to patients with high cholesterol, evaluators may also want to determine whether healthcare systems are using electronic medical records to track patient health outcomes. EMRs with the following components should be counted:

- Decision support components
- Alerts
- Electronic prescriptions
If applying the indicator within a single healthcare system, the indicator will simply denote the presence or absence of the given policy.

References


Proposed Indicator: Prevalence of specialized chronic care clinics with a focus on high cholesterol (2.1.3)

Rating:

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<tr>
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Priority Area: Controlling High Cholesterol

Logic Model Component:
Short-term Outcomes Box 1 – Healthcare System Changes: Adherence, Efficiency, Policies/Protocols/Tools

What to Measure:
Proportion of healthcare systems with specialized chronic care clinics that address high cholesterol. Specific elements of these clinics are provided in “Comments” below.

Why This Indicator is Useful:
Evidence shows that specialized clinics (e.g., specialty cardiovascular risk reduction clinics (CRRC), pharmacist-managed or nurse-managed lipid clinics) can achieve better cholesterol-related outcomes than other types of care (e.g., enhanced primary care, VA Medical Centers) (Becker et al., 1998; Mazzolini et al., 2008; Pearson et al., 2008). Others have found that lipid clinics reduced waiting times, led to improved lipid results, and improved follow-up, all of which were sustained over time (Stuart & Smellie, 2005).

How to Measure:
TO BE DETERMINED

Population Group:
Healthcare systems

Comments:
Specialized clinics are typified by a focus on facilitating more frequent contact with patients and providing patient education to enhance adherence to improve the control of high cholesterol. HDSP state programs are encouraged to partner with other chronic disease programs such as Diabetes Prevention and Control programs to increase the prevalence of chronic care clinics.
Other Information

If applying the indicator within a single healthcare system, the indicator will simply denote the presence or absence of the specialized chronic care clinic.

References


†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
Proposed Indicator | Proportion of healthcare systems with treatment algorithms that incorporate recommendations of current evidence-based cholesterol guidelines (2.1.4)
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**Rating**

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Priority Area: Controlling High Cholesterol

Logic Model Component: Short-term Outcomes Box 1 – Healthcare System Changes: Adherence, Efficiency, Policies/Protocols/Tools

What to Measure: Proportion of healthcare systems with policies for the use of treatment algorithms that incorporate recommendations of the ATP III guidelines.

Why This Indicator is Useful: Guidelines for coronary heart disease risk assessment can be useful in early identification and treatment of those at risk. In a study comparing different guidelines, it was shown that ATP III guidelines predicted higher levels of risk than other guidelines (e.g., revised Sheffield table, Munster Heart Study calculator) (Broedl et al., 2003). Furthermore, the ATP III guidelines have been shown to be a cost-effective primary prevention strategy for lipid-lowering (Pletcher et al., 2009).

How to Measure: TO BE DETERMINED

Population Group: Healthcare systems

Other Information: If applying the indicator within a single healthcare system, the indicator will simply denote the presence or absence of the given policy.

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<tr>
<td>What to Measure</td>
<td>Number of quality improvement initiatives implemented by healthcare systems that provide targeted, intensive support for guideline compliance as well as review of practitioner adherence to treatment guidelines.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>Quality improvement initiatives to increase practitioner adherence to ATP III guidelines can improve cardiovascular disease prevention services, including increases in the patients on lipid-lowering therapy, consistent documentation of cholesterol levels, and increases of patients meeting their LDL goal (Brown et al., 2000; McBride et al., 2000; Stamos et al., 2001).</td>
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$††$ Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
Proposed Indicator | Proportion of healthcare systems with policies to follow up with patients tested for high cholesterol (2.1.6)

Rating

Overall Quality | Resources Needed | Scientific Evidence | Face Validity | Utility | Accepted Practice

low ← → high

Priority Area | Controlling High Cholesterol

Logic Model Component | Short-term Outcomes Box 1 – Healthcare System Changes: Adherence, Efficiency, Policies/Protocols/Tools

What to Measure | Proportion of healthcare systems with policies that include information about type, timing, and intensity of follow up with patients tested for high cholesterol.

Why This Indicator is Useful | ATP III guidelines recommend follow-up with patients to promote healthy lifestyle modifications and adherence to pharmaceutical therapies (Executive Summary of the Third Report of NECP, 2001). Letters to patients and their general practitioners have been shown to be effective in improving the use of lipid lowering medications in primary prevention and increasing consultation rates for secondary prevention (Atthobari et al., 2004; Feder et al., 1999).

How to Measure | TO BE DETERMINED

Population Group | Healthcare systems

Other Information | If applying the indicator within a single healthcare system, the indicator will simply denote the presence or absence of the given policy.

The Institute for Healthcare Improvement’s Continuing Care Clinic (CCC) Handbook is a step-by-step guide to establishing more efficient patient visits. The Handbook recommends:

- At routine intervals about one month before their first scheduled CCC, mail a letter of introduction about the CCC to the selected patients to determine their interest in participation.
- Review patients’ medical records and determine clinical priorities.
• Using the scheduling template, lay out each patient schedule of care for the visit.
• Complete individual patient schedules and mail to patient along with confirmation letter. Be sure patient receives confirmation of CCC visit 2 weeks ahead of the visit day so that he or she can visit the lab to have requested blood work done as needed.
• Order lab work and send lab requisitions to appropriate lab facility as needed.
• Call patients 1 week prior to visit day to remind about schedules and lab work.

References


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### Proposed Indicator

Proportion of healthcare systems with policies to increase patient adherence to high cholesterol treatment (including lifestyle modification and pharmacologic components) (2.1.7)

### Rating

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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Short-term Outcomes Box 1 – Healthcare System Changes: Adherence, Efficiency, Policies/Protocols/Tools

### What to Measure

Proportion of healthcare systems with policies in place intended to increase patient adherence to high cholesterol treatment. These may include information about the type, timing, and intensity of follow up with patients screened for high cholesterol to increase patient adherence to high cholesterol treatment. Specific elements for evaluation are provided in “Comments” below.

### Why This Indicator is Useful

Adherence to high cholesterol treatment is imperative to reducing LDL cholesterol levels among those at risk for coronary heart disease. Pharmaceutical care services and lifestyle modification advice have been shown to improve adherence rates. For example, one study found that utilizing pharmacists in collaboration with patients and physicians can lead to greater levels of adherence, resulting in more successful management of lipid levels (Blumle et al., 2000; Lee et al., 2006). A study by Robinson et al. (2000) found that a telephone-based computerized system that included lifestyle modification information resulted in lower levels of LDL cholesterol among participants.

### How to Measure

TO BE DETERMINED

### Population Group

Healthcare systems

### Comments

Evaluators may want to assess whether the healthcare system has existing policies related to the use of electronic medication monitoring equipment and pharmacy care programs to increase medication adherence.
as well as systems to prompt provider inquiry into adherence to recommended lifestyle medication activities. Evaluators may also choose to gather data on the size and demographics of the population effected by the relevant policies.

**Other Information**  If applying the indicator within a single healthcare system, the indicator will simply denote the presence or absence of the given policy.

**References**


†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
LOGIC MODEL BOX 2: Provider Changes

Healthcare system policy and system changes (logic model component 1) support provider level changes in treatment. The National Cholesterol Education Program Adult Treatment Panel III (ATP III) guidelines address cholesterol measurement, recommended cholesterol treatment algorithms, related cardiovascular risk factors, and treatment goals. Providers are crucial to initiating and maintaining therapeutic lifestyle modifications among their patients and monitoring and modifying medication regimens (Brown & Cofer, 2000; Fonarow & Gawlinski, 2000; Lester, Grant, Barnett, & Chueh, 2006; Pearson, Laurora, Chu, & Kafonek, 2000; Stamos, Shaltoni, Girard, Parrillo, & Calvin, 2001). Evidence suggests that improvements in provider prescription practices lead to significant increases in the proportion of patients receiving cholesterol-lowering prescriptions, leading to improved cholesterol control (Brown & Cofer, 2000; Pearson et al., 2000; Stamos et al., 2001). Furthermore, research demonstrates that patients who achieve recommended ATP III goals have improved health outcomes (Fletcher et al., 2005; NIH, 2002; Stanek et al., 2007).

Studies demonstrate that information-based interventions can lead to significant increases in provider adherence to ATP III guidelines (Lester et al., 2006; Stamos et al., 2001). Additionally, provider-focused quality improvement initiatives to increase adherence to evidence-based guidelines have been shown to enhance high cholesterol screening, treatment and control (Feder et al., 1999; Ornstein, 2004).

The short-term outcome indicators for controlling high cholesterol for this component are:

2.2.1 Proportion of providers who order blood cholesterol tests according to current evidence-based guidelines

2.2.2 Proportion of providers who classify LDL, HDL, and total cholesterol according to current evidence-based guidelines

2.2.3 Proportion of providers who document major cardiovascular risk factors noted in current evidence-based cholesterol guidelines

2.2.4 Proportion of providers who increase monitoring and shifts in medication for patients unable to achieve cholesterol treatment goals

2.2.5 Proportion of providers who follow current evidence-based guideline algorithms for pharmacologic therapies to treat high cholesterol

2.2.6 Proportion of patients with high cholesterol who receive provider-initiated recommendation and follow-up of therapeutic lifestyle modifications

2.2.7 Proportion of providers who counsel patients with high cholesterol on how to follow prescribed medicines

2.2.8 Proportion of providers who work with patients to identify cholesterol self-management goals
References


Fonarow GC, Gwilsinki A. Rationale and design of the Cardiac Hospitalization Atherosclerosis Management Program at the University of California Los Angeles. American Journal of Cardiology 2000;85(3A):10A–17A.


### Proposed Indicator

**Proportion of providers who order blood cholesterol tests according to current evidence-based guidelines (2.2.1)**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Overall Quality</th>
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<th>Scientific Evidence</th>
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</table>

### Priority Area

Controlling High Cholesterol

### Logic Model Component

Short-term Outcomes Box 2 – Provider Changes: Awareness, Adherence to Guidelines

### What to Measure

Proportion of healthcare providers who measure cholesterol according to guidelines. For a list of recommendations, see “Comments” below.

### Why This Indicator is Useful

Failure to measure cholesterol appropriately can be a barrier to diagnosis and treatment of high cholesterol. Provider-focused interventions that improve knowledge and practices have been linked to improvements in detection/monitoring of high cholesterol and possibly reductions of cholesterol levels (Frolkis et al., 1998; Ornstein et al., 2004).

### How to Measure

**Administrative Medical Records** reviews, including data abstracted from patient charts, electronic medical records, or registries

### Population Group

Healthcare providers

### Comments

In all adults 20 years or older, a fasting lipoprotein profile (total cholesterol, LDL cholesterol, high density lipoprotein (HDL) cholesterol, and triglyceride) is recommended once every 5 years. If the testing opportunity is nonfasting, only the values for total cholesterol and HDL cholesterol will be usable. In such a case, if total cholesterol is $\geq 200$ mg/dL or HDL is $<40$ mg/dL, a follow-up lipoprotein profile is needed for appropriate management.

### References


<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Proportion of providers who classify LDL, HDL, and total cholesterol according to current evidence-based guidelines (2.2.2)</th>
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</table>

| Priority Area       | Controlling High Cholesterol                                      |
| Logic Model Component| Short-term Outcomes Box 2 – Provider Changes: Awareness, Adherence to Guidelines                               |
| What to Measure     | Proportion of providers classifying documented cholesterol levels according to ATP III guidelines. These guidelines are noted in the “Comments” section below |
| Why This Indicator is Useful | Enhancing providers’ ability to classify high cholesterol according to ATP III guidelines leads to improvements in treatment. Provider-focused interventions such as audits and feedback have been associated with increases in the rates of high cholesterol diagnosis as well as other cardiovascular risk factors (Ornstein et al., 2004; Stacy & Egger, 2006; Stanek et al., 2007). |
| How to Measure      | **Administrative Medical Records** reviews, including data abstracted from patient charts, electronic medical records, or registries |
| Population Group    | Healthcare providers                                              |
| Comments            | ATP III Classification Guidelines of LDL, Total, and HDL Cholesterol (mg/dL):                                       |
| **LDL Cholesterol** | <100 Optimal                                                                                                     |
|                     | 100–129 Near optimal/above optimal                                                                                 |
|                     | 130–159 Borderline high                                                                                           |
160–189 High
≥190 Very high

**Total Cholesterol**

<200 Desirable
200–239 Borderline high
≥240 High

**HDL Cholesterol**

<40 Low
≥60 High

Three Categories of Risk that Modify LDL Cholesterol Goals

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>LDL Goal (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD and CHD risk equivalents</td>
<td>&lt;100</td>
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<tr>
<td>Multiple (2+) risk factors</td>
<td>&lt;130</td>
</tr>
<tr>
<td>Zero to one risk factor</td>
<td>&lt;160</td>
</tr>
</tbody>
</table>

**References**


Stacy TA, Egger A. Results of retrospective chart review to determine improvement in lipid goal attainment in patients treated by high-volume prescribers of lipid-modifying drugs. *Journal of Managed Care Pharmacy* 2006;12(9):745–51.


† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within one point of the median for this criterion.

†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
### Proposed Indicator

**Proportion of providers who document major cardiovascular risk factors noted in current evidence-based cholesterol guidelines (2.2.3)**

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<thead>
<tr>
<th>Rating</th>
<th>Overall Quality</th>
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</table>

### Priority Area

Controlling High Cholesterol

### Logic Model Component

Short-term Outcomes Box 2 – Provider Changes: Awareness, Adherence to Guidelines

### What to Measure

Proportion of healthcare providers documenting major cardiovascular risk factors noted in ATP III guidelines that modify treatment goals. For a list of these risk factors, see “Comments” below.

### Why This Indicator is Useful

Documenting major cardiovascular risk factors noted in the ATP III guidelines provides information important in treatment decisions. The guidelines emphasizes that cardiovascular risk determines the type and intensity of the therapy offered (Pearson et al., 2000).

### How to Measure

**Administrative Medical Records** reviews, including data abstracted from patient charts, electronic medical records, or registries

### Population Group

Healthcare providers

### Comments

Major Risk Factors (Exclusive of LDL Cholesterol) That Modify Goals

- Cigarette smoking
- Hypertension (BP >140/90 mmHg or on antihypertensive medication)
- Low HDL cholesterol (<40 mg/dL)
- Family history of premature CHD (CHD in male first degree relative <55 years; CHD in female first degree relative <65 years)
- Age (men >45 years; women >55 years)
References


Pearson TA, Laurora I, Chu H, Kafonek S. The Lipid Treatment Assessment Project (L-TAP) a multicenter survey to evaluate the percentages of dyslipidemic patients receiving lipid-lowering therapy and achieving low-density lipoprotein cholesterol goals. *Archives of Internal Medicine* 2000;160:459-467.

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<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Proportion of providers who increase monitoring and shifts in medication for patients unable to achieve cholesterol treatment goals (2.2.4)</th>
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<tbody>
<tr>
<td>Rating</td>
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<tr>
<td>Logic Model Component</td>
<td>Short-term Outcomes Box 2 – Provider Changes: Awareness, Adherence to Guidelines</td>
</tr>
<tr>
<td>What to Measure</td>
<td>Proportion of providers who have made documented changes in therapeutic medication regimen among patients with unable to achieve cholesterol goals.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>Increasing monitoring and shifts in medication for patients who are unable to achieve treatment goals assists in reducing drug therapy problems and helps individuals to reach the optimal goal for cholesterol (Isetts et al., 2008).</td>
</tr>
<tr>
<td>How to Measure</td>
<td>Administrative Medical Records reviews, including data abstracted from patient charts, electronic medical records, or registries</td>
</tr>
<tr>
<td>Population Group</td>
<td>Healthcare providers</td>
</tr>
</tbody>
</table>
### Proposed Indicator

**Proportion of providers who follow current evidence-based guideline algorithms for pharmacologic therapies to treat high cholesterol (2.2.5)**

<table>
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<th>Rating</th>
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<tr>
<th>Logic Model Component</th>
<th>Short-term Outcomes Box 2 – Provider Changes: Awareness, Adherence to Guidelines</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>What to Measure</th>
<th>Proportion of providers utilizing medication treatments recommended by ATP III</th>
</tr>
</thead>
</table>

| Why This Indicator is Useful | Enhancing providers’ adherence to treatment guidelines increases cholesterol control in patients. Failure to provide adequate or appropriate cholesterol-lowering drugs may result in inadequate cholesterol control (Executive Summary of the Third Report of the NCEP, 2001; Stamos et al., 2001). |

<table>
<thead>
<tr>
<th>How to Measure</th>
<th><strong>Administrative Medical Records</strong> reviews, including data abstracted from patient charts, electronic medical records, or registries</th>
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|-------------|-----------------------------------------------------------------------|

<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Proportion of patients with high cholesterol who receive provider-initiated recommendation and follow-up of therapeutic lifestyle modifications (2.2.6)</th>
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<tbody>
<tr>
<td>Rating</td>
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<tr>
<td>Logic Model Component</td>
<td>Short-term Outcomes Box 2 – Provider Changes: Awareness, Adherence to Guidelines</td>
</tr>
<tr>
<td>What to Measure</td>
<td>Proportion of patients with high cholesterol who have received provider-initiated prescription for therapeutic lifestyle modifications recommended by ATP III. For the list of ATP III lifestyle modifications, see “Comments” below.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>For individuals with elevated LDL cholesterol levels, the goal of therapy is achieved through the judicious use of lifestyle and drug therapies. Provider-initiated discussion and follow-up of therapeutic lifestyle modifications, if consistently applied, improves cardiovascular risk (Executive Summary of the Third Report of the NCEP, 2001).</td>
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<tr>
<td>How to Measure</td>
<td>National Ambulatory Medical Care Survey</td>
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<tr>
<td></td>
<td>• Patient information</td>
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<td>• Major reason for visit</td>
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<td>• Primary and other diagnoses</td>
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<td>• Conditions patient currently has</td>
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<td>• Status of patient enrollment in disease management program</td>
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<td></td>
<td>• Diagnostic/screening services ordered or provided</td>
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<td></td>
<td>• Health education ordered or provided at visit</td>
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<td>• Non-medication ordered or provided at visit</td>
</tr>
<tr>
<td>Administrative Medical Records</td>
<td>reviews, including data abstracted from patient charts, electronic medical records, or registries</td>
</tr>
</tbody>
</table>
Population Group: Adults with high cholesterol aged 18 years or older

Comments: ATP III Lifestyle Therapies:
- Reduced intakes of saturated fat (<7% of total calories) and cholesterol (<200 mg per day)
- Increase fiber intake
- Weight reduction
- Increased physical activity

References:

† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within one point of the median for this criterion.
### Proposed Indicator

**Proportion of providers who counsel patients with high cholesterol on how to take prescribed medicines (2.2.7)**

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#### Priority Area

Controlling High Cholesterol

#### Logic Model Component

Short-term Outcomes Box 2 – Provider Changes: Awareness, Adherence to Guidelines

#### What to Measure

Proportion of providers who advise patients how to follow prescribed drug treatment regimens as described in evidence-based guidelines. For more information, see “Comments” below.

#### Why This Indicator is Useful

Only about half of patients prescribed lipid-lowering medications are still taking them six months later. Health care providers, given the proper training, can be effective at offering preventive pharmaceutical care for decreasing high blood cholesterol and the risk for coronary heart disease through patient counseling (Lenz, 2003).

#### How to Measure

TO BE DETERMINED

#### Population Group

Healthcare providers

#### Comments

ATP III Guidelines recommend:

*Explicit patient instruction and use good counseling techniques to teach the patient how to follow the prescribed treatment.* Including:

- Provide explicit instruction on how to take lipid modifying medications.
- Emphasize the need for continued treatment for CHD risk reduction.
- Reassure the patient about the safety of the regimen (if appropriate). Emphasize the potential benefits of treatment. Attempt to link these benefits to the LDL level, which provides the patient with a measure with which to track progress.
• Make adherence to therapy an ongoing topic of discussion. Inform the patient that you will be asking about this at each visit and will want to explore ways to help overcome any problems encountered.
• Make instructions concise and reinforce them with written materials or Web-based information.
• Take time to answer the patient’s questions. Verify that the patient understands the instructions.

References


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### Proposed Indicator

<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Proportion of providers who work with patients to identify cholesterol self-management goals (2.2.8)</th>
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#### Rating

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#### Priority Area

Controlling High Cholesterol

#### Logic Model Component

Short-term Outcomes Box 2 – Provider Changes: Awareness, Adherence to Guidelines

#### What to Measure

Proportion of providers who counsel patients to identify self-management goals. Potential components are listed in “Comments” below.

#### Why This Indicator is Useful

Research notes that self-management techniques, goal setting, and consistent monitoring improve adherence to health programs and sustains patient behavior change (Backer & Kirschenbaum, 1993; Oldridge & Jones, 1983).

#### How to Measure

TO BE DETERMINED

#### Population Group

Healthcare providers

#### Comments

Self-Management Components for Cholesterol Control:
- Reduced intakes of saturated fats and cholesterol
- Therapeutic dietary options for enhancing LDL lowering (plant stanols/sterols and increased viscous [soluble] fiber)
- Weight reduction
- Increased regular physical activity
- Smoking cessation
- Adherence to medication regimens

#### References


LOGIC MODEL BOX 3:  
Worksite Changes

The workplace provides an opportunity to reach large numbers of individuals for the purpose of promoting good health and preventing disease, particularly cardiovascular disease (Atlantis et al., 2006). Approximately 90% of all U.S. worksites with 50 or more employees have some form of health promotion program (USDHHS, 2000). Employers provide or provide access to health promotion programs to improve productivity, lower health care costs, enhance corporate image and long-term interests, and contribute to making a public health impact (Baum, 1994; Wilson, Holman, & Hammock, 1996).

Increasing healthcare costs are a top concern noted by employers (USDHHS, 2000). Seventy percent of the total healthcare costs for the United States comprise individuals with chronic diseases and 29% of all deaths in the United States are related to heart disease (CDC, 2004). High cholesterol, as a significant risk factor for cardiovascular disease, is an important target for health and wellness interventions in the workplace. Worksites provide an opportune setting to tackle the challenge of high cholesterol by allowing for the creation of policies and environments that support healthy behaviors critical to cholesterol control such as increased physical activity, proper nutrition, and preventive care (CDC, 2003).

Recent research confirms that worksite programs help improve employee dietary intake and cholesterol levels (Koffman et al., 2005). A variety of programs have been associated with improved employee health-related behaviors, lowered cholesterol levels and increased cholesterol control including health risk assessments, disease management, activity classes, nutritional education, and monetary incentives (Bloch et al., 2006; Byers et al., 1995; Calderon et al., 2008; Goetzel et al., 2002; Henritze et al., 1992; Maron et al., 2008).

In these indicator materials, “workplace” refers to any or all places where people are employed, while “worksites” are specific physical locations, buildings, or settings where people report to work. The indicators will measure the number or proportion of worksites that have a specific characteristic.

Short-term outcome indicators for controlling high cholesterol in the workplace include:

2.3.1 Proportion of worksites with employer payment for services to control high cholesterol
2.3.2 Proportion of worksites that offer behavioral approaches for employees to control high cholesterol
2.3.3 Proportion of worksites that provide health risk assessments that include high cholesterol monitoring
2.3.4 Proportion of worksites with environmental supports to control high cholesterol
References


### Proposed Indicator

**Proportion of worksites with employer payment for services to control high cholesterol (2.3.1)**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Overall Quality</th>
<th>Resources Needed</th>
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#### Priority Area

Controlling High Cholesterol

#### Logic Model Component

Short-term Outcomes Box 3 – Worksite Changes: Policies/Protocols/Tools, Environmental Changes

#### What to Measure

Proportion of worksites with employer-provided healthcare coverage and/or payment for services to control high cholesterol and cardiovascular risk. For a more complete list of recommended services, see “Comments” below.

#### Why This Indicator is Useful

Employer payment for services to control high cholesterol increases employee use (Erfurt & Holtyn, 1991). Lifestyle counseling is typically the first step in treating high cholesterol and remains critical throughout all stages of treatment; however, healthy behavior counseling services are one of the most poorly covered preventive care services among large (500+) employers (Bondi et al., 2006). Ensuring that individuals have access to care helps to improve adherence to medication and has been shown to improve individual behavior and decrease hospitalization costs associated with high cholesterol (Harvey et al., 1993; Koffman et al., 2005).

#### How to Measure

Heart/Stroke Check: A Worksite Assessment Tool for Preventing Heart Disease and Stroke

- Do at least half of available health insurance plans pay for outside services or does the company directly provide lifestyle management programs for any of the following?
  - Cholesterol/lipid control
  - Smoking cessation
  - Weight management
o Healthy eating

- During the past 12 months, did your worksite provide cholesterol screenings?
- Was one-on-one lifestyle counseling with clinical referral and follow-up provided for employees who were determined to have high cholesterol?
- During the past 12 months, did your worksite provide seminars, educational workshops, or classes (including online, telephone conference or self study guide) related to preventing and controlling high cholesterol?

**National Worksite Health Promotion Survey, 2006**
- During the last 12 months, did you offer (INSERT PROGRAM) to your employees and/or their families either through your worksite, or through one of your health plans or both?
  o Screenings for cholesterol level
  o Physical activity and/or fitness programs
  o Nutrition education
  o Cholesterol reduction education
  o Weight management classes/counseling
  o Smoking cessation classes/counseling

**Massachusetts Worksite Health Improvement Survey, 2008**
- Do your insurance benefits cover preventive (non-regulated) services for employees? If yes, which services are included?
  o Cholesterol screening
  o Diet and nutrition counseling
  o Tobacco cessation
- In the past year, has your organization offered any of the following on-site health screenings or preventive services?
  o Cholesterol screening
  o Tobacco cessation
- In the past year, has your organization offered on-site health education classes, workshops, lectures, or special events on any of the following topics?
  o Tobacco cessation
  o Weight management
  o Physical activity and/or exercise
Community Health Assessment and Group Evaluation (CHANGE) Tool

- To what extent does the worksite:
  - Provide an onsite medical clinic to monitor and address chronic disease risk factors (e.g., high blood pressure, high cholesterol, blood glucose)?
  - Provide routine screening, follow-up counseling and education to employees to help prevent and control chronic disease risk factors (e.g., poor nutrition, physical inactivity, hypertension, high cholesterol, elevated blood sugar levels, tobacco use)?
  - Provide access to chronic disease self-management programs (e.g., diabetes, asthma, obesity – such as Weight Watchers)?

<table>
<thead>
<tr>
<th>Population Group</th>
<th>Worksites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comments</td>
<td>A Purchaser’s Guide to Preventive Services recommends coverage for lipid disorder screening, counseling and treatment. Therapeutic lifestyle change counseling should encourage dietary changes, increased physical activity, tobacco avoidance, weight control, moderation of alcohol intake as well as pharmacological therapies to achieve cholesterol control.</td>
</tr>
</tbody>
</table>

†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
### Proportion of worksites that offer behavioral approaches for employees to control high cholesterol (2.3.2)

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### Priority Area

**Controlling High Cholesterol**

### Logic Model Component

**Short-term Outcomes Box 3 – Worksite Changes: Policies/Protocols/Tools, Environmental Changes**

### What to Measure

Proportion of worksites providing access to health promotion programs that support therapeutic lifestyle changes to control cholesterol levels such as dietary changes, increased physical activity, tobacco cessation, and weight control.

### Why this Indicator is Useful

Worksite-based health promotion programs that provide sustained individual follow-up and counseling within the context of a comprehensive health promotion program have been shown to decrease cardiovascular risk factors (Calderon, Smallwood, & Tipton, 2008; Goetzel et al., 2002). Employer incentives increase employee participation in worksite programs (Erfurt & Holtyn, 1991).

### How to Measure

**Heart/Stroke Check: A Worksite Assessment Tool for Preventing Heart Disease and Stroke**

- Do at least half of available health insurance plans pay for outside services or does the company directly provide lifestyle management programs for any of the following?
  - Cholesterol/lipid control
  - Smoking cessation
  - Weight management
  - Healthy eating
- Was one-on-one lifestyle counseling with clinical referral and follow-up provided for employees who were determined to have high cholesterol?
• During the past 12 months, did your worksite provide brochures, videos, posters, pamphlets, newsletters, health fairs, or other information that addresses the risks of developing high cholesterol?

• During the past 12 months, did your worksite provide seminars, educational workshops, or classes (including online, telephone conference or self study guide) related to preventing and controlling high cholesterol?

National Worksite Health Promotion Survey, 2006

• During the last 12 months, did your worksite offer ongoing lifestyle behavior change programs (such as regular meetings, sessions, or counseling) related to nutrition, exercise or smoking?

• Do you currently offer—either through the company or through employee health plans—disease prevention programs or disease management programs related to high cholesterol?

Massachusetts Worksite Health Improvement Survey, 2008

• Do your insurance benefits cover preventive (non-regulated) services for employees? If yes, which services are included?
  o Diet and nutrition counseling
  o Tobacco cessation

• In the past year, has your organization offered any of the following on-site health screenings or preventive services?
  o Tobacco cessation

• In the past year, has your organization offered on-site health education classes, workshops, lectures, or special events on any of the following topics?
  o Tobacco cessation
  o Weight management
  o Physical activity and/or exercise


• During the last 12 months, did your worksite offer physical activity and/or fitness programs to employees?

• During the last 12 months, did your worksite offer healthy eating classes or counseling?

• During the last 12 months, did your worksite offer weight management classes or counseling to employees?

• During the last 12 months, did your worksite offer smoking cessation classes or counseling to employees?
**Community Health Assessment and Group Evaluation (CHANGE) Tool**

- To what extent does the worksite:
  - Provide routine screening, follow-up counseling and education to employees to help prevent and control chronic disease risk factors (e.g., poor nutrition, physical inactivity, hypertension, high cholesterol, elevated blood sugar levels, tobacco use)?
  - Provide access to chronic disease self-management programs (e.g., diabetes, asthma, obesity – such as Weight Watchers)?

**HERO Employee Health Management Best Practices Scorecard**

- Does your organization offer any targeted lifestyle management/behavior modification programs? If yes, which lifestyle management/behavior modification program(s) do you offer?
  - Cholesterol management
  - Tobacco use cessation
  - Weight management
  - Physical activity
  - Healthy eating/nutrition

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<th>Worksites</th>
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**Other Information**

If applying the indicator within a single worksite, the indicator will simply denote the presence or absence access to health promotion programs with components to control high cholesterol.

**References**


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### Proposed Indicator

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<th>Proportion of worksites providing health risk assessments that include high cholesterol monitoring (2.3.3)</th>
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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Short-term Outcomes Box 3 – Worksite Changes: Policies/Protocols/Tools, Environmental Changes

### What to Measure

The proportion of worksites offering on-site risk assessments for high cholesterol monitoring

### Why this Indicator is Useful

Less than half of individuals qualifying for lipid-lowering pharmacologic treatment, even those in the highest risk groups, receive it (Full Report of the Third Report of the NCEP, 2001). Implementing health risk assessments, especially when accompanied by sustained individual follow-up and counseling to improve health behaviors, is an effective way to reduce cardiovascular risks. On-site employee risk reduction programs promote improved risk factor profiles (Henritze, Brammel & McGloin, 1992).

### How to Measure

**Heart/Stroke Check: A Worksite Assessment Tool for Preventing Heart Disease and Stroke**

- During the past 12 months, did your worksite provide health risk appraisal assessments?
- During the past 12 months, did your worksite provide cholesterol screenings?

**National Worksite Health Promotion Survey, 2004**

- During the last 12 months, did you offer (INSERT PROGRAM) to your employees and/or their families either through your worksite, or through one of your health plans or both?
  - Screenings for cholesterol level
  - Health Risk Assessment (HRA)
Massachusetts Worksite Health Improvement Survey, 2008
- In the past year, has your organization offered a Health Risk Assessment?
- In the past year, has your organization offered any of the following on-site health screenings or preventive services?
  - Cholesterol screening

- During the last 12 months, did your worksite offer screenings for cholesterol levels to employees?
- During the last 12 months, did your worksite offer questionnaires about health habits or Health Risk Assessments to employees...

Community Health Assessment and Group Evaluation (CHANGE) Tool
- To what extent does the worksite:
  - Provide routine screening, follow-up counseling and education to employees to help prevent and control chronic disease risk factors (e.g., poor nutrition, physical inactivity, hypertension, high cholesterol, elevated blood sugar levels, and tobacco use)?
  - Provide access to free or low cost employee health risk appraisals or health screenings?

HERO Employee Health Management Best Practices Scorecard
- Does your organization offer a health risk questionnaire? These are also called health risk assessments or health assessments.

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References

Proposed Indicator: Proportion of worksites with environmental supports to control high cholesterol (2.3.4)

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Priority Area: Controlling High Cholesterol

Logic Model Component: Short-term Outcomes Box 3 – Worksite Changes: Policies/Protocols/Tools, Environmental Changes

What to Measure: Proportion of worksites that have made environmental changes to increase access to healthier foods with nutritional quality policies or nutrition labeling, improved access to physical activity venues, or non-smoking policies in the workplace.

Why this Indicator is Useful: Making environmental changes such as ensuring smoke-free worksites, providing access to physical activity venues, increasing the proportion of healthier prepared and ready-to-eat foods, and nutrition labeling can help support employee efforts to reduce high cholesterol (Brownson et al., 2006; Cheadle et al., 2000).

How to Measure: Heart/Stroke Check: A Worksite Assessment Tool for Preventing Heart Disease and Stroke

- Does your worksite prohibit the sale of tobacco products (e.g. vending machines, vendors, etc.)?
- Is there a written tobacco use policy at your worksite?
- Does your worksite have signs or labels near the food vending machines, cafeterias, or snack bars about healthy foods?
- Does your worksite provide nutritious food options for employee meetings?
- Does your worksite provide an exercise facility on site?
- During the past 12 months, did your worksite provide cholesterol screening?
- During the past 12 months, did your worksite provide seminars, educational workshops, or classes (including online, telephone
conference or self study guide) related to weight control?

**National Worksite Health Promotion Survey, 2004**

- Do you have a formal, written policy for (INSERT ITEM)?
  - Tobacco that completely prohibits smoking on your organization’s property
  - Physical activity, that allows employees to take fitness breaks on the job
  - Nutrition, that requires healthy food options available at all company meetings/functions

- Does your worksite have an on-site exercise facility?

- Does your worksite …?
  - Offer special promotions/discounts to encourage healthy food choices
  - Provide fitness breaks
  - Have fitness or walking trails on site

**Massachusetts Worksite Health Improvement Survey, 2008**

- Does your organization have an on-site exercise facility?

- Does your organization have a written policy to ensure that healthy food items are offered for any of the following?
  - Vending machines
  - Meetings or catered events

- Does your organization have a written policy governing employee smoking during the work day?

- Does your organization have a written policy that governs an employee’s ability to smoke outside of work hours?

- Is the sale of tobacco products prohibited at the worksite?

**Georgia Worksite Health Promotion Policies and Practices Survey, 2008**

- Does your worksite have any on-site exercise facilities?

- What types of on-site facilities are offered to your employees?

- Does your worksite offer any on-site exercise classes?

- Does your worksite have a policy allowing flextime for participation in physical activities or special breaks in the workday for physical activity?

- Do you have a formal policy for tobacco that prohibits or severely restricts smoking at the worksite/on the job?
Community Health Assessment and Group Evaluation (CHANGE) Tool

- To what extent does the worksite:
  
  o Provide access to onsite fitness center, gymnasium, or physical activity classes?
  
  o Institute healthy food and beverage options at company-sponsored meetings and events?
  
  o Institute healthy food and beverage options in vending machines?
  
  o Institute healthy food and beverage options in onsite cafeteria and food venues?
  
  o Institute nutritional labeling (e.g., ‘low fat,’ ‘light,’ ‘heart healthy,’ or ‘no trans fat’) at the worksite’s cafeteria and onsite food service?
  
  o Institute pricing strategies that encourage the purchase of healthy food and beverage options?
  
  o Provide direct material support (e.g., money, land, a pavilion, sponsorship, donated advertising) for community-wide nutrition opportunities (e.g., farmers’ markets or community garden initiatives)?
  
  o Institute a smoke free policy 24/7?

HERO Employee Health Management Best Practices Scorecard

- Does the physical work environment support employee health and well-being with any of the following elements?
  
  o Fitness centers, walking or biking trails, etc.
  
  o Smoke-free environment
  
  o Healthy food options in cafeterias, vending machines, and/or at catered events
  
  o Well-lit and accessible stairways
  
  o Quiet/relaxation areas

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LOGIC MODEL BOX 4: Community Changes

Communities can be defined as a group of people who share some or all of the following: geopolitical boundaries; a sense of membership; culture and language; common norms, interests, or values; and common health risks or conditions. Community-based interventions to address high blood cholesterol have shown modest but significant impacts on population levels of cholesterol (Becker et al., 2005; Gordon et al., 2001; Shea & Basch, 1990a, 1990b). These interventions use public education, social marketing, media, and policy advocacy interventions delivered through mass media, community-based organizations, schools, and government agencies. Many efforts also utilize community-based collaboratives and partnerships to increase program relevance and participation, facilitate social norm changes, and enhance sustainability (Becker et al., 2005; Gordon et al., 2001; Shea & Basch, 1990a).

Evidence suggests that changing community norms plays a key role in supporting the maintenance of individual behavior change (Curry et al., 1993). To accomplish these changes, it is important to ensure that interventions are comprehensive and that they act across multiple levels of the community (Brownson, Haire-Joshu, & Luke, 2006). Environmental factors play a significant role in helping to control cholesterol levels and decrease cardiovascular risk. Environmental supports such as access to parks, school playgrounds and playing fields, walking paths, and fitness centers; access to fresh fruits and vegetables in supermarkets and convenience stores; land-use, transportation and zoning policies that encourage safe alternatives to driving; and food quality in government-run worksites, and public and private schools can influence individual behavior related to controlling high cholesterol including physical activity and dietary habits (Brownson et al., 2006; Kahn et al., 2002; Morland, Diez Roux, & Wing, 2006; Saelens, Sallis & Frank, 2002; Veugelers & Fitzgerald, 2005). Assessing community-level indicators provides an opportunity to identify and track implementation of key strategies (Cheadle, Sterling, Schmid, & Fawcett, 2000).

The short-term outcome indicators for the community setting are:

2.4.1 Number of legislative policies to support therapeutic lifestyle behaviors for high cholesterol

2.4.2 Number of community interventions to control high cholesterol

2.4.3 Number of community environmental supports to control high cholesterol

2.4.4 Proportion of community-based organizations that are linked to health care and public health systems to support control of high cholesterol
References


### Proposed Indicator

Number of legislative policies to support therapeutic lifestyle behaviors for controlling high cholesterol (2.4.1)

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#### Priority Area

Controlling High Cholesterol

#### Logic Model Component

Short-term Outcomes Box 4: Community Changes: Environmental Changes, Policy/Legislative Changes

#### What to Measure

Number of legislative policies to support therapeutic lifestyle behavior changes such as increased access to healthier foods, improved nutrition labeling, improved access to physical activity venues, or reduced opportunities to smoke.

#### Why This Indicator is Useful

Elevated cholesterol is a major and modifiable risk factor for heart disease, the leading cause of death in the United States (Schober et al., 2007). Legislative policies to support lifestyle and behavior changes including diet, smoking cessation, and increased mandated nutrition labeling by restaurants have been shown to be effective in supporting lifestyle and behavior changes and lowering risk (Browson, Haire-Joshu, & Luke, 2006; Koffman et al., 2005).

#### How to Measure

Survey of Policies and Programs Related to Health For Cities and Towns in Massachusetts, 2007

- Does your city or town have a policy that requires bikeways or pedestrian walkways...?
  - Alongside bridges
  - Alongside freeways
  - Alongside local roads and streets
  - To and within parks
  - To and around shopping centers
  - To and around schools
Is there a policy in place requiring that healthy food choices such as 1% or skim milk, low fat entrees, low-sodium entrees, fruit, vegetables, or salads are available at the cafeterias?

Does your city or town have a policy requiring that healthy food and beverages, such as trail mix, granola bars, water and 1% milk, are available in vending machines?

Does your city or town have a by-law or regulation requiring notices or labels on menus in eating establishments indicating which foods or food items may be healthy?

Does your city or town ban the use of cooking with trans fats in eating establishments?

**Heart Disease and Stroke Prevention Legislative Database** is a centralized database for state HDSP policies

**Community Health Assessment and Group Evaluation (CHANGE) Tool**

- To what extent does the community institution/organization:
  - Ban marketing of unhealthy food onsite, including through counter advertisements, posters, and other print materials?
  - Prohibit the sale of sugar-sweetened beverages, including flavored or sweetened milk?
  - Ban tobacco vending machine sales (including self-service displays)?
  - Ban tobacco promotions, promotional offers, and prizes?
  - Ban tobacco advertisement (e.g., restrict point-of-purchase advertising, product placement)?

**Population Group**

Not applicable. Indicator measures legislative policies in the community.

**Other Information**

If applying the indicator within a single community/organization, the indicator will simply denote the presence or absence of the given policy.

**References**


Proposed Indicator | Number of community interventions to control high cholesterol (2.4.2)

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Priority Area | Controlling High Cholesterol

Logic Model Component | Short-term Outcomes Box 4: Community Changes: Environmental Changes, Policy/Legislative Changes

What to Measure | Number of community interventions intended to help control high cholesterol. More information regarding types of activities that typify these interventions is included in “Comments” below.

Why This Indicator is Useful | Community initiatives such as community-wide education campaigns have promoted decreased cholesterol levels in targeted locations (Farquhar et al., 1990). Targeted, comprehensive community-based health promotion programs in the United States and Finland have been shown to improve cardiovascular health (Shea & Bash, 1990).

How to Measure | Survey of Policies and Programs Related to Health For Cities and Towns in Massachusetts, 2007
- Does your city or town partner with private organizations such as YMCA, private gyms or Boys and Girls Club to promote physical activity?
- How does your city or town promote physical activity?
- Does your city or town provide awareness training or education on:
  - Choosing food outside the home
  - Preparing healthy foods
  - Growing fruits and vegetables
  - Other nutrition education
- Does your city or town board of health or other group partner with organizations or retail food establishments such as grocery stores
or restaurants to promote healthy eating?

- During the past 12 months, has your city or town offered any of the following health screening services to the public?
  - Cholesterol screening

**Community Health Assessment and Group Evaluation (CHANGE) Tool**

- To what extent does the community institution/organization:
  - Provide routine screening, follow-up counseling and education to employees to help prevent and control chronic disease risk factors (e.g., poor nutrition, physical inactivity, hypertension, high cholesterol, elevated blood sugar levels, and tobacco use)?
  - Encourage non-motorized commutes (e.g., active transportation, such as walk or bike) to the facility?

**Population Group**  
Not applicable. Indicator measures community interventions.

**Comments**  
Community interventions intended to control high cholesterol may include mass media campaigns, involvement of lay advisors and community health workers in monitoring therapeutic lifestyle changes, and community-based cholesterol screening. Programs implemented in multiple locations should be tailored to the specific cultural and social context.

**Other Information**  
Evaluators should consider monitoring type of intervention and associated dose as well as overall number of interventions within a community.

**References**  


## Proposed Indicator

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<th>Number of community environmental supports to control high cholesterol (2.4.3)</th>
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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Short-term Outcomes Box 4: Community Changes: Environmental Changes, Policy/Legislative Changes

### What to Measure

Number of community environmental changes to control high cholesterol. Examples of environmental changes are included in “Comments” below.

### Why This Indicator is Useful

Environmental changes that support physically activity and healthy eating to reduce blood cholesterol levels (Brownson, Hiare-Joshu, & Luke, 2006; Shea & Basch, 1990).

### How to Measure

Survey of Policies and Programs Related to Health For Cities and Towns in Massachusetts, 2007

- Does your city or town have a Public Recreation Program?
  - Does the Public Recreation Program offer physical activity programs?
    - Are these physical activity programs accessible to people with disabilities?
  - Does your city or town have access to physical activity for adults at any of the following types of recreation facilities?
    - Local schools
    - City/town owned recreation facility
    - Universities/colleges
    - State, county or DCR owned facility
    - Corporate recreation facility
    - YMCA/YWCA
o Private gyms
• Does your city or town have bicycle parking
• Do any municipal buildings in your city or town have vending machines?
  o Do you have a pricing strategy that encourages people to choose healthy food and beverages?
• Does your city or town have meal calories listed on menus in eating establishments?

Community Health Assessment and Group Evaluation (CHANGE) Tool
• To what extent does the community institution/organization:
  o Designate a walking path on or near building property?
  o Provide bicycle parking for patrons (e.g., bike rack, shelter)?
  o Provide direct material support (e.g., money, land, pavilion, recreational facilities, sponsorship, and advertising) for supporting community-wide physical activity opportunities (e.g., sports teams, walking clubs)?
  o Provide access to onsite fitness center, gymnasium, or physical activity classes?
  o Provide access to a broad range of competitive and noncompetitive physical activities that help to develop the skills needed to participate in lifetime physical activities?
  o Institute healthy food preparation practices (e.g., steaming, low fat, low salt, limiting frying) in onsite cafeteria and food venues?
  o Institute pricing strategies that encourage the purchase of healthy food and beverage options?
  o Institute nutritional labeling (e.g., ‘low fat,’ ‘light,’ ‘heart healthy,’ or ‘no transfat’) at onsite cafeteria and food venues?
  o Provide safe, unflavored, cool drinking water at no cost to patrons?

Population Group Not applicable. Indicator measures environmental changes in the community.

Comments Note that from a public health perspective, community interventions and environmental changes may be similar. Browson, Haire-Joshu, and Luke (2006) describe the growing interest in interventions to change the physical and sociopolitical environments to reduce chronic disease. Such
environmental and policy change approaches are often more permanent than interventions focused on individual-level behavioral change.

Examples of environmental changes to control high cholesterol include those that expand or enhance access to physical activity facilities, support regular physical activity (e.g., complete streets), increase healthy food choices through greater availability and improved labeling, and reduce tobacco use.

References


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Priority Area: Controlling High Cholesterol

Logic Model Component: Short-term Outcomes Box 4: Community Changes: Environmental Changes, Policy/Legislative Changes

What to Measure: Proportion of community-based organizations with linkages to health care and public health systems through formal means such as memorandum of agreement to provide services in support of therapeutic lifestyle changes.

Why This Indicator is Useful: Studies demonstrate that linkages between health care and community-based organizations enhance self-management of cardiovascular risk factors and improved rates of follow-up (Piatt et al., 2006; Shea & Basch, 1990).

How to Measure: TO BE DETERMINED

Population Group: Community-based organizations

References:


LOGIC MODEL BOX 5: Individual Changes

Appropriate individual behaviors supported by the health system, healthcare providers, the workplace, and community, are essential to controlling high cholesterol and modifying cardiovascular risk. Appropriate individual behaviors include awareness, knowledge, and adherence to healthy lifestyle and treatment regimens to control high cholesterol.

Patient education interventions to improve detection and control of high cholesterol and increase patient adherence to treatment take many forms but include both individual-focused and group-focused efforts. Programs often address multiple levels of the socioecologic model to achieve positive outcomes for individuals with high cholesterol and cardiovascular disease (McLeroy et al., 1988). Although the methods, contents, length, and intensity of the related intervention studies vary, generally results suggest support for the effectiveness of patient education approaches to high blood cholesterol detection and management (e.g., Becker et al., 2005; Gordon et al., 2001; Shea & Basch, 1990).

Research demonstrates that individuals frequently have inadequate knowledge and awareness of their personal cholesterol levels and their risk for cardiovascular disease (Goldman, et al., 2006). Gender, education, low income, and access to care are all factors associated with disparities in awareness (Harawa et al., 2001; Hertz et al., 2006). For educational strategies to have an impact on health outcomes, interventions must first address awareness and knowledge along with skill development (Mosca et al., 2006).

A barrier to individual change includes the lack of access to care and an inability to pay for services and treatment, including therapeutic medications to improve cholesterol control. Estimates for non-adherence to medication regimens because of cost barriers range from 14 to 25 percent of persons in the United States (Piette et al., 2004). One study found that almost half (43%) of study participants restricted their use of medications and that this use restriction was associated with being 70 years and older, being from a minority ethnicity, having an annual income of $10,000 or less, and having out-of-pocket medication costs in excess of $100 per month (Steinman et al., 2001).

The short-term outcome indicators associated with individual behaviors are:

2.5.1 Proportion of adults who know their cholesterol level(s)

2.5.2 Proportion of adults who have had their cholesterol checked within the previous five years

2.5.3 Degree of disparity in knowledge of the risks of high cholesterol between general and priority populations

2.5.4 Proportion of adults who know which therapeutic lifestyle behavior changes are associated with controlling high cholesterol
2.5.5 Proportion of adults who are aware of their personal risk associated with high cholesterol

2.5.6 Average annual out-of-pocket patient costs for prescription medication attributable to the treatment of high cholesterol

2.5.7 Average annual out-of-pocket costs associated with therapeutic lifestyle modification for the treatment of high cholesterol

References


Harawa NT, Morgenstern H, Beck J, Moore A. Correlates of knowledge of one's blood pressure and cholesterol levels among older members of a managed care plan. *Aging* 2001 Apr;13(2):95–104.


## Proposed Indicator

| Proportion of adults who know their cholesterol level(s) (2.5.1) |

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Priority Area: Controlling High Cholesterol

Logic Model Component: Short-term Outcomes Box 5 – Individual Changes: Awareness, Knowledge

What to Measure: Proportion of adults who are able to report their cholesterol level(s)

**Why This Indicator is Useful**

Studies have shown that knowledge of cholesterol levels can increase patient recognition of health risks (Goldman et al., 2006) and encourage individual behavior change (Mosca et al., 2006). Lack of patient knowledge of cholesterol levels may indicate disparities in healthcare quality (Hertz et al., 2006).

**How to Measure**

**American Heart Association’s Women’s Study, 1997**

- When you had [your cholesterol] checked last, were you told the result was normal, too high, or too low?
- Do you know what your HDL or "good" cholesterol level is?
- Do you know what your LDL or "bad" cholesterol level is?

Population Group: Adults 18 or older

**References**


Mosca L, Mochari H, Christian A, et al. National Study of Women’s Awareness, Preventive Action, and Barriers to Cardiovascular

Proposed Indicator | Proportion of adults who have had their cholesterol checked within the previous five years (2.5.2)

Rating

<table>
<thead>
<tr>
<th>Overall Quality</th>
<th>Resources Needed</th>
<th>Scientific Evidence</th>
<th>Face Validity</th>
<th>Utility</th>
<th>Accepted Practice</th>
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<td>← better</td>
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Priority Area | Controlling High Cholesterol

Logic Model Component

Short-term Outcomes Box 5 – Individual Changes: Awareness, Knowledge

What to Measure

Proportion of adults who report having their cholesterol checked within the previous five years.

Why This Indicator is Useful

More frequent cholesterol checks are associated with increased perceived risk (Hertz et al., 2006) that may encourage individual behavior change (Mosca et al., 2006).

How to Measure

Administrative Medical Records reviews, including data abstracted from patient charts, electronic medical records, or registries

Behavioral Risk Factor Surveillance System (BRFSS)

- About how long has it been since you last had your blood cholesterol checked?

National Health and Nutrition Examination Survey (NHANES)

- Have you ever had your blood cholesterol checked?
- About how long has it been since you last had your blood cholesterol checked?

National Health Interview Survey (NHIS)

- About how long has it been since you had your blood cholesterol checked by a doctor, nurse, or other health professional?
- Enter time period for time since last blood cholesterol check.

Population Group | Adults 18 or older
References


<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Degree of disparity in knowledge of the risks of high cholesterol between general and priority populations (2.5.3)</th>
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<tbody>
<tr>
<td>Rating</td>
<td>![Rating Chart]</td>
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<tr>
<td>Priority Area</td>
<td>Controlling High Cholesterol</td>
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<tr>
<td>Logic Model Component</td>
<td>Short-term Outcomes Box 5 – Individual Changes: Awareness, Knowledge</td>
</tr>
<tr>
<td>What to Measure</td>
<td>Degree of disparities regarding knowledge of high cholesterol risk factors between all adults with high cholesterol and those within priority groups.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>Disparities have been noted in CVD risk factors and high cholesterol awareness by racial and ethnic group and by gender in the United States (Mosca et al., 2006; Hertz et al., 2006). Efforts to increase access to services have been shown to reduce associated differences across general and priority populations (Stewart &amp; Silverstein, 2002).</td>
</tr>
<tr>
<td>How to Measure</td>
<td>American Heart Association’s Women’s Study, 2006</td>
</tr>
<tr>
<td></td>
<td>- Which of the following activities do you believe can prevent or reduce the risk of getting heart disease?</td>
</tr>
<tr>
<td></td>
<td>- Getting physical exercise</td>
</tr>
<tr>
<td></td>
<td>- Taking special vitamins like E, C or A</td>
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<tr>
<td></td>
<td>- Losing weight</td>
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<td></td>
<td>- Reducing dietary cholesterol intake</td>
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<td>- Reducing stress</td>
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<td></td>
<td>- Reducing sodium or salt in the diet</td>
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<td></td>
<td>- Reducing animal products in your diet (such as meat, whole milk, butter and cream)</td>
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</table>
Population Group  Adults 18 years or older

References


### Proposed Indicator

<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Proportion of adults who know which therapeutic lifestyle behavior changes are associated with controlling high cholesterol (2.5.4)</th>
</tr>
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</table>

### Rating

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<thead>
<tr>
<th>Rating</th>
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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Short-term Outcomes Box 5 – Individual Changes: Awareness, Knowledge

### What to Measure

Proportion of adults with high cholesterol who can accurately identify lifestyle behavioral changes associated with improved cholesterol control.

### Why This Indicator is Useful

Audience-tailored and simplified information enhance patient knowledge of high blood cholesterol risk reduction strategies (Goldman et al., 2006). Individual changes in knowledge are associated with changes in behavior and subsequent reductions in cholesterol levels (Masur-Levy et al., 1990).

### How to Measure

TO BE DETERMINED

### Population Group

Adults 18 years or older

### References


†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
Proposed Indicator | Proportion of adults who are aware of their personal risk associated with high cholesterol (2.5.5)
---|---
**Rating**<br>Overall Quality | Resources Needed | Scientific Evidence | Face Validity | Utility | Accepted Practice<br>low ←→ high<br>←●●●●○○→ better<br>$\$ || |

**Priority Area** | Controlling High Cholesterol

**Logic Model Component** | Short-term Outcomes Box 5 – Individual Changes: Awareness, Knowledge

**What to Measure** | Proportion of adults with high cholesterol who are aware of their personal risks associated with high cholesterol.

**Why This Indicator is Useful** | Increased knowledge of cholesterol levels can help identify patient recognition of their personal health risks associated with cardiovascular disease and encourage behavior change (Goldman et al., 2006).

**How to Measure** | TO BE DETERMINED

**Population Group** | Adults 18 or older

**References**

Harawa NT, Morgenstern H, Beck J, Moore A. Correlates of knowledge of one's blood pressure and cholesterol levels among older members of a managed care plan. *Aging* 2001;13(2):95–104.

<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Average annual out-of-pocket patient costs for prescription medication for the treatment of high cholesterol (2.5.6)</th>
</tr>
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<td>Rating</td>
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<tr>
<td>Priority Area</td>
<td>Controlling High Cholesterol</td>
</tr>
<tr>
<td>Logic Model Component</td>
<td>Short-term Outcomes Box 5 – Individual Changes: Awareness, Knowledge</td>
</tr>
<tr>
<td>What to Measure</td>
<td>Average, per-capita costs of prescription medications attributable to high cholesterol and related outcomes.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>Out-of-pocket costs of prescription medications may contribute to nonadherence and underuse among persons with chronic disease (Hirth et al., 2008; Mojtabai &amp; Olfson, 2003; Piette, Heisler, &amp; Wagner, 2004; Steinman, Sands, &amp; Covinsky, 2001).</td>
</tr>
<tr>
<td>How to Measure</td>
<td>Health and Retirement Study, Wave 3 – 1996 is a national longitudinal study based on core biennial interviews of nearly 20,000 individuals representing the US population over age 50.</td>
</tr>
<tr>
<td></td>
<td>- Do you regularly take prescription medications?</td>
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<td></td>
<td>- Were the costs of your prescription medications completely covered by Medicare, Medicaid, or other health insurance, partly covered by insurance, or not covered at all by health insurance?</td>
</tr>
<tr>
<td></td>
<td>- On the average, about how much have you paid out-of-pocket per month for these prescriptions?</td>
</tr>
<tr>
<td>Population Group</td>
<td>Adults 18 years or older</td>
</tr>
<tr>
<td>Other Information</td>
<td>Evaluators should use caution in interpreting cost information. Ideally, this indicator should be monitored over time and linked with adherence.</td>
</tr>
<tr>
<td>References</td>
<td>Hirth RA, Greer SL, Albert JM, Young EW, and Piette JD. Out-Of-Pocket Spending And Medication Adherence Among Dialysis Patients In</td>
</tr>
</tbody>
</table>


Proposed Indicator | Average annual out-of-pocket costs associated with therapeutic lifestyle modification for the treatment of high cholesterol (2.5.7)
---|---
Rating | $$$ ○ ○ ○ ○ ○ ○
Overall Quality | low → high
Resources Needed | better
Scientific Evidence | face validity
Utility | accepted practice
Priority Area | Controlling High Cholesterol
Logic Model Component | Short-term Outcomes Box 5 – Individual Changes: Awareness, Knowledge
What to Measure | All out-of-pocket patient costs associated with therapeutic lifestyle modifications for the treatment of high cholesterol—items not paid to a medical provider or pharmacy. May include costs of physical activity programs, cost of dietary changes, etc.
Why This Indicator is Useful | Evidence-based guidelines recommend therapeutic lifestyle changes including decreased saturated fat and cholesterol intake, increased soluble fiber intake, weight reduction, and increased physical activity to reduce risk factors for CHD (Executive Summary of the Third Report of the NCEP, 2001). Measuring barriers to making these lifestyle changes, including out-of-pocket costs associated with therapeutic lifestyle change services, is important to understanding systems-level impacts on individual-level behaviors.
How to Measure | TO BE DETERMINED
Population Group | Adults 18 years or older
Other Information | Evaluators should use caution in interpreting cost information. Increases in out-of-pocket costs for therapeutic lifestyle modifications may be mitigated by reductions in other areas (e.g., decreased purchase of red meat)
References


†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
LOGIC MODEL BOX 6: Risk Factor Reduction

Changes in individual knowledge, awareness, and behavior-change skills lead to significant reductions in the levels of risk factors associated with high cholesterol and cardiovascular disease (CVD). Participating regularly in physical activity (Becker et al., 2005; Bijlani et al., 2005; Gordon et al., 2001), following a recommended diet (Becker et al., 2005; Kris-Etherton et al., 2001; Ockene et al., 1999; Walden et al., 2000), reducing body weight (Gordon et al., 2001; Ockene et al., 1999; Turley, Skeaff, Mann, & Cox, 1998), and decreasing tobacco use (Becker et al., 2005) have been shown to enhance cholesterol control and lower the risk of developing CVD. Investigators have also demonstrated that patient adherence to LDL cholesterol lowering medication regimens is critical for achieving recommended cholesterol levels (Becker et al., 1998; Kinn et al., 2001; Pujia, 2002; Robinson, Conroy, & Wickemeyer, 2000).

Unfortunately, it is often the individuals at the greatest risk for high cholesterol-related morbidity and mortality who are not adherent to treatment regimens. Priority populations such as minorities, people with low income, and the elderly are more likely to develop CVD, but also less likely to remain adherent to prescription regimens (Brenner et al., 2002). Often, cholesterol-controlling medications are cost-prohibitive, especially for the un- or under-insured, leading these patients to stop treatment prematurely or to take medication less frequently than recommended (Chaudry & McDermott, 2008). There is evidence that subsidizing cholesterol medication for low-income individuals can help achieve cholesterol goals at rates similar to or greater than people with better health insurance (Marrs & Saseen, 2008). Since CVD risk factors for priority populations are similar to those for the general population, many of the same risk-reduction strategies such as increasing exercise, quitting smoking, and eating healthier foods apply for these groups (McCauley, 2007). However, specially designed interventions to target these populations might be beneficial as well (King et al., 1997; Kumanyika, 1993).

The intermediate outcome indicators for this component are:

2.6.1 Proportion of adults who follow a recommended diet to reduce their high cholesterol
2.6.2 Proportion of adults with high cholesterol who participate regularly in physical activity
2.6.3 Prevalence of obesity among adults with high cholesterol
2.6.4 Smoking prevalence among adults with high cholesterol
2.6.5 Proportion of smokers with high cholesterol who have made a quit attempt using proven cessation methods
2.6.6 Degree of disparity in risk factors for high cholesterol between general and priority populations
2.6.7 Proportion of adults with high cholesterol who adhere to LDL cholesterol-lowering medication regimens

2.6.8 Degree of disparity in adherence to high cholesterol medication regimens between general and priority populations

References


<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Proportion of adults who follow a recommended diet to reduce their high cholesterol (2.6.1)</th>
</tr>
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<tbody>
<tr>
<td>Rating</td>
<td>![Rating Table]</td>
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<tr>
<td>Priority Area</td>
<td>Controlling High Cholesterol</td>
</tr>
<tr>
<td>Logic Model Component</td>
<td>Intermediate Outcomes Box 6 – Risk Factor Reduction Through Lifestyle And Therapeutic Intervention</td>
</tr>
<tr>
<td>What to Measure</td>
<td>Proportion of adults with high cholesterol who note that they are changing/have changed their eating habits to lower high cholesterol. See “Comments” for recommended dietary changes.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>Evidence-based guidelines recommend dietary changes and potential referrals to registered dieticians or other qualified nutritionists as an initial step in the treatment of high cholesterol (Executive Summary of the Third Report of the NCEP, 2001). Studies have shown that participation in interventions with healthcare providers trained on cholesterol guidelines contribute to improved patient dietary profiles (Becker et al., 1998; Ockene et al., 1999) and that patient education programs, including healthy eating guidance, contribute to improved patient outcomes (Fijlani et al., 2005; Walden et al., 2000).</td>
</tr>
<tr>
<td>How to Measure</td>
<td>National Health and Nutrition Examination Survey (NHANES)</td>
</tr>
<tr>
<td>-</td>
<td>Because your high blood cholesterol, have you ever been told by a doctor or other health professional to eat fewer high fat or high cholesterol foods?</td>
</tr>
<tr>
<td>-</td>
<td>Are you now making diet changes?</td>
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<tr>
<td>Population Group</td>
<td>Adults 18 years or older</td>
</tr>
<tr>
<td>Comments</td>
<td>ATP III recommends a Therapeutic Lifestyle Change (TLC) Diet that includes the following nutrient composition:</td>
</tr>
<tr>
<td></td>
<td>- Saturated fat: Less than 7% of total calories</td>
</tr>
</tbody>
</table>
• Polyunsaturated fat: Up to 10% of total calories
• Monounsaturated fat: Up to 20% of total calories
• Total fat: 25–35% of total calories
• Carbohydrate: 50–60% of total calories
• Fiber: 20–30 g/day
• Protein: Approximately 15% of total calories
• Total calories (energy): Balance energy intake and expenditures to maintain desirable body weight/prevent weight gain

References


Walden CE; Retzlaff BM; Buck BL; McCann BS; Knopp RH. Lipoprotein Lipid Response to the National Cholesterol Education Program Step II Diet by Hypercholesterolemic and Combined Hyperlipidemic Women and Men. *Arteriosclerosis, Thrombosis, and Vascular Biology* 1997;17(2):375–382.
### Proposed Indicator

**Proportion of adults with high cholesterol who participate regularly in physical activity (2.6.2)**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Overall Quality</th>
<th>Resources Needed</th>
<th>Scientific Evidence</th>
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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Intermediate Outcomes Box 6 – Risk Factor Reduction Through Lifestyle And Therapeutic Intervention

### What to Measure

Proportion of adults with high cholesterol who receive at least 30 minutes of moderate physical activity on most days of the week.


### Why This Indicator is Useful

Physical inactivity is a major risk factor for cardiovascular disease. Continued, moderate-intensity physical activity has been shown to contribute to improved HDL-C levels (Coghill & Cooper, 2008; Kokkinos & Fernhall, 1999).

### How to Measure

**Behavioral Risk Factor Surveillance System (BRFSS)**

- Have you EVER been told by a doctor, nurse or other health professional that your blood cholesterol is high?
- Physical Activity, Core Module

**National Health and Nutrition Examination Survey (NHANES)**

- Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
- Physical Activity Module
National Health Interview Survey (NHIS)

- Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
- Adult Health Behavior Module

Population Group  Adults 18 years or older

Comments  Adults can be considered to be engaging in regular physical activity if they meet the Healthy People 2010 objective of at least 30 minutes a day of moderate-intensity activity on 5 or more days a week, or at least 20 minutes a day of vigorous-intensity activity on 3 or more days a week, or both.


## Proposed Indicator Profile

**Prevalence of obesity among adults with high cholesterol (2.6.3)**

### Rating

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<th>Overall Quality</th>
<th>Resources Needed</th>
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- Low → High
- Better

### Priority Area

Controlling High Cholesterol

### Logic Model Component

Intermediate Outcomes Box 6 – Risk Factor Reduction Through Lifestyle And Therapeutic Intervention

### What to Measure

Proportion of adults with high cholesterol who have a BMI of 30 or greater


### Why This Indicator is Useful

Obesity is a significant risk factor for cardiovascular disease. Evidence-based guidelines state “Weight reduction therapy for overweight or obese patients will enhance LDL lowering and will provide other health benefits including modifying other lipid and nonlipid risk factors” (Executive Summary of the Third Report of the NCEP, 2001). Favorable lipid levels are associated with moderate physical activity, weight change, and fiber-rich carbohydrate diets (Mora et al., 2006; Stamler et al., 1997; Turley et al., 1998).

### How to Measure

**Behavioral Risk Factor Surveillance System (BRFSS)**

- Have you ever been told by a doctor, nurse, or other health professional that your blood cholesterol is high?
- About how much do you weigh without shoes?
- About how tall are you without shoes?

**National Health and Nutrition Examination Survey (NHANES)**

- Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
- Measured height and weight
• How tall are you without shoes?
• How much do you weigh without clothes or shoes?

**American Heart Association’s Women’s Study, 1997**

• In the past 18 months, have you had your cholesterol level checked?
• When you had it checked last, were you told the result was normal, too high, or too low?
• What is your height in feet and inches?
• What is your weight in pounds?

**Population Group**  
Adults 18 years or older

**References**


### Proposed Indicator

**Smoking prevalence among adults with high cholesterol (2.6.4)**

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- **Overall Quality**: $\,$
- **Resources Needed**: $\,$
- **Scientific Evidence**: $\,$
- **Face Validity**: $\,$
- **Utility**: $\,$
- **Accepted Practice**: $\,$

**Priority Area**: Controlling High Cholesterol

**Logic Model Component**: Intermediate Outcomes Box 6 – Risk Factor Reduction Through Lifestyle And Therapeutic Intervention

**What to Measure**: Proportion of adults with high cholesterol who have ever smoked at least 100 cigarettes in their lives and who smoke every day or some days

**Why This Indicator is Useful**: Smoking substantially increases the risk of CHD and has been linked with elevated serum triglycerides and low HDL cholesterol levels (Executive Summary of the Third Report of the NCEP, 2001). Additionally, measurements of smoking prevalence in priority populations can help to identify barriers to risk behavior cessation (Becker et al., 2005).

**How to Measure**

**Behavioral Risk Factor Surveillance System (BRFSS)**

- Have you ever been told by a doctor, nurse, or other health professional that your blood cholesterol is high?
- Have you ever smoked at least 100 cigarettes in your entire life?
- Do you now smoke cigarettes every day, some days, or not at all?

**National Health and Nutrition Examination Survey (NHANES)**

- Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
- Have you smoked at least 100 cigarettes in your entire life?
- Do you now smoke cigarettes...
  - Every day
  - Some days
  - Not at all
  - Refused
o Don’t know

**National Health Interview Survey (NHIS)**

- Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
- Have you smoked at least 100 cigarettes in your ENTIRE LIFE?
- Do you NOW smoke cigarettes every day, some days or not at all?

**Population Group**  
Adults 18 years and older

**References**


† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within one point of the median for this criterion.
### Proposed Indicator

**Proportion of smokers with high cholesterol who have made a quit attempt using proven cessation methods (2.6.5)**

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#### Priority Area

Controlling High Cholesterol

#### Logic Model Component

Intermediate Outcomes Box 6 – Risk Factor Reduction Through Lifestyle And Therapeutic Intervention

#### What to Measure

The proportion of adults with high cholesterol who have stopped smoking at least 1 day during the previous 12 months using proven cessation methods in an attempt to quit smoking entirely. Examples of proven cessation strategies are (1) FDA-approved medications, (2) in-person individual counseling, (3) counseling from telephone quitlines, and (4) stop-smoking classes.

#### Why This Indicator is Useful

Smoking substantially increases the risk of coronary heart disease and has been linked with elevated serum triglycerides and low HDL-C levels (Executive Summary of the Third Report of the NCEP, 2001). Research in the general population shows that use of effective cessation strategies significantly increases the success of quit attempts compared with unassisted quit attempts (2008 PHS Guideline Update Panel, Liaisons, and Staff, 2008).

#### How to Measure

The **Adult Tobacco Survey** has the following questions that measure a smoking quit attempt using evidence-based methods:

- During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?
- The last time you tried to quit smoking, did you use any other assistance such as classes or counseling?
- If yes, did you use? (Check all that apply)
  - A stop-smoking clinic or class
  - A telephone quitline
  - One-on-one counseling from a doctor or nurse
  - Self-help material, books or videos
Section 3–Indicator Profiles

- Acupuncture
- Hypnosis
- Other, specify______

To monitor this indicator, these questions could be added to a survey that assesses cholesterol status, like the Behavioral Risk Factor Surveillance System.

**Population Group**  Adults 18 years or older

**References**


Proposed Indicator: Degree of disparity in risk factors for high cholesterol between general and priority populations (2.6.6)

Rating

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<th>Overall Quality</th>
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Priority Area: Controlling High Cholesterol

Logic Model Component: Intermediate Outcomes Box 6 – Risk Factor Reduction Through Lifestyle And Therapeutic Intervention

What to Measure: Degree of disparity of high cholesterol risk factors between all adults with high cholesterol and those within priority groups.

Why This Indicator is Useful: Reducing health disparities remains a major public health challenge in the United States due in part to substantial differences in access to quality health care. Effectively reducing cardiovascular disease disparities requires identifying and reducing disparities in risk factors (Hertz et al., 2005). Research demonstrates that comprehensive risk-reduction programs can support improved health outcomes in priority populations (Gordon et al., 2001).

How to Measure: Behavioral Risk Factor Surveillance System (BRFSS)
- Pertinent demographic information
- About how much do you weigh without shoes?
- About how tall are you without shoes?
- Tobacco Use, Core Module
- Fruits and Vegetables, Core Module
- Physical Activity, Core Module

National Health and Nutrition Examination Survey (NHANES)
- Pertinent demographic information
- Physical Activity Module
- Smoking Module
- Weight History Module
National Health Interview Survey (NHIS)

- Pertinent demographic information
- Adult Health Behaviors Module

Population Group

Adults 18 years and older

References


### Proposed Indicator

**Proportion of adults with high cholesterol who adhere to LDL cholesterol-lowering medication regimens (2.6.7)**

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#### Priority Area

Controlling High Cholesterol

#### Logic Model Component

Intermediate Outcomes Box 6 – Risk Factor Reduction Through Lifestyle And Therapeutic Intervention

#### What to Measure

Proportion of adults with high cholesterol reporting that they are currently taking prescribed medication to control high cholesterol

#### Why This Indicator is Useful

In clinical trials, the amount of risk reduction achieved is linked with adherence to treatment. Fewer than half of persons qualifying for lipid-modifying treatment, including those at highest risk who have symptomatic CHD, are receiving it. Lipid-lowering medications take 6 months to 1 year before their benefits become apparent. Currently only 50 percent of patients prescribed lipid-lowering medications are still taking them 6 months later. This drops to 30 to 40 percent after 12 months. Subsequently, only about one third of treated persons are achieving LDL goals (Full Report of the Third Report of the NCEP, 2001).

#### How to Measure

TO BE DETERMINED

#### Population Group

Adults 18 years or older

#### Comments

This indicator is best monitored via self-reported questions about adherence to cholesterol medication regimen.

#### References


<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Degree of disparity in adherence to high cholesterol medication regimens between general and priority populations (2.6.8)</th>
</tr>
</thead>
</table>

**Rating**

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<th>Overall Quality</th>
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</table>

**Priority Area**

Controlling High Cholesterol

**Logic Model Component**

Intermediate Outcomes Box 6 – Risk Factor Reduction Through Lifestyle And Therapeutic Intervention

**What to Measure**

Degree of disparity of adherence to high cholesterol regimens between all adults with high cholesterol and those within priority groups

**Why This Indicator is Useful**

Evidence-based guidelines note that adherence to high cholesterol regimens are poor across all ethnic, racial, gender, and age groups (Full Report of the Third Report of the NCEP, 2001). Research suggests that physician-focused, patient-centered therapies that are maintained over time enhance adherence to high-cholesterol regimens (Chaudhry & McDermott, 2008).

**How to Measure**

TO BE DETERMINED

**Population Group**

Adults 18 years or older

**Comments**

This indicator is best monitored via self-reported questions about adherence to cholesterol medication regimen.

**References**


LOGIC MODEL BOX 7:
Reduced Levels of Cholesterol

The Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) Final Report notes that, "the robust relationship between total cholesterol and coronary heart disease (CHD) found in epidemiological studies strongly implies that an elevated LDL is a powerful risk factor" (NIH, 2002). One study indicates that each 1% reduction in LDL cholesterol reduces major coronary events by 1.7% (Pederson et al., 1998). Other research demonstrates the increased cost of cardiovascular disease related to elevated cholesterol levels (Druss et al., 2001; Goetzel et al., 2004). In addition to LDL cholesterol, total cholesterol levels act as a significant risk factor. One meta-analysis suggests that each 10% decline in total cholesterol reduces CHD mortality by 15% (Gould et al., 1998).

While reducing cholesterol and triglyceride levels overall can lead to better health outcomes, boosting HDL cholesterol levels in the population provides an alternate channel to prevent cardiovascular events and CHD-related mortality. The Framingham Heart Study found that HDL cholesterol was the strongest lipid predictor of CHD after age 49 (Gordon et al., 1977). Moreover, it was discovered that non-HDL cholesterol was strongly associated with CHD risk as well (Emerging Risk Factors Collaboration, 2009). Furthermore, low HDL cholesterol levels were associated with coronary artery disease, even when controlling for LDL cholesterol and triglyceride levels (Pearson et al., 1979). As HDL and LDL cholesterol levels can vary independently of each other, patients on aggressive statin therapy and even those achieving LDL goals may require medication treatment or lifestyle changes to increase HDL levels (Alsheikh-Ali et al., 2007).

The intermediate outcome indicators associated for this component are:

2.7.1 Average LDL cholesterol level among adults with high cholesterol
2.7.2 Average HDL cholesterol level among adults with high cholesterol
2.7.3 Average triglyceride level among adults with high cholesterol
2.7.4 Average total cholesterol level among adults with high cholesterol

References


### Proposed Indicator

**Average LDL cholesterol level among adults with high cholesterol (2.7.1)**

### Rating

<table>
<thead>
<tr>
<th>Overall Quality</th>
<th>Resources Needed</th>
<th>Scientific Evidence</th>
<th>Face Validity</th>
<th>Utility</th>
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<td>better</td>
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</table>

### Priority Area

Controlling High Cholesterol

### Logic Model Component

Intermediate Outcomes Box 7 – Reduced Levels Of Cholesterol

### What to Measure

Average LDL level among adults who specify that they have high cholesterol

### Why This Indicator is Useful

Research indicates that elevated LDL cholesterol is a major cause of CHD and it has been proven that LDL-lowering therapy reduces the risk for CHD. It is for these reasons that ATP III continues to identify elevated LDL cholesterol as the primary target of cholesterol-lowering therapy (Executive Summary of the Third Report of the NCEP, 2001).

### How to Measure

National Health and Nutrition Examination Survey (NHANES)

- Pertinent demographic information
- Have you ever been told by a doctor or other health professional that your blood cholesterol was high?
- Measured: Blood draw: LDL (Morning session participants only)

*Administrative Medical Records* reviews, including data abstracted from patient charts, electronic medical records, or registries

### Population Group

Adults 18 years or older

### References


Robinson JG, Conroy C, Wickemeyer WJ. A novel telephone-based system for management of secondary prevention to a low-density lipoprotein cholesterol ≤100mg/dl. *American Journal of Cardiology*


Walden CE; Retzlaff BM; Buck BL; McCann BS; Knopp RH. Lipoprotein Lipid Response to the National Cholesterol Education Program Step II Diet by Hypercholesterolemic and Combined Hyperlipidemic Women and Men. Arteriosclerosis, Thrombosis, and Vascular Biology 1997;17(2):375–382.
Proposed Indicator: Average HDL cholesterol level among adults with high cholesterol (2.7.2)

Rating:

- Overall Quality
- Resources Needed
- Scientific Evidence
- Face Validity
- Utility
- Accepted Practice

Priority Area: Controlling High Cholesterol

Logic Model Component: Intermediate Outcomes Box 7 – Reduced Levels Of Cholesterol

What to Measure: Average HDL level among adults who specify that they have high cholesterol

Why This Indicator is Useful: There is strong evidence linking low levels of serum HDL cholesterol to increased CHD morbidity and mortality, while high HDL-cholesterol levels appear to confer reduced CHD risk (Emerging Risk Factors Collaboration. 2009; Gordon et al., 1989; Wilson et al., 1998). Population studies show a continuous rise in risk for CHD as HDL-cholesterol levels decline (Full Report of the Third Report of the NCEP, 2001).

How to Measure: National Health and Nutrition Examination Survey (NHANES)

- Pertinent demographic information
- Have you ever been told by a doctor or other health professional that your blood cholesterol was high?
- Measured: Blood draw: HDL

Administrative Medical Records reviews, including data abstracted from patient charts, electronic medical records, or registries

Population Group: Adults 18 years or older


Walden CE; Retzlaff BM; Buck BL; McCann BS; Knopp RH. Lipoprotein Lipid Response to the National Cholesterol Education Program Step II Diet by Hypercholesterolemic and Combined Hyperlipidemic Women and Men. *Arteriosclerosis, Thrombosis, and Vascular Biology* 1997;17(2):375–382.


### Proposed Indicator

**Average triglyceride level among adults with high cholesterol (2.7.3)**

<table>
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<tr>
<th>Rating</th>
<th>Overall Quality</th>
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</table>

**Priority Area**: Controlling High Cholesterol

**Logic Model Component**: Intermediate Outcomes Box 7 – Reduced Levels Of Cholesterol

**What to Measure**: Average triglyceride level among adults who specify that they have high cholesterol

**Why This Indicator is Useful**: Elevated serum triglycerides are associated with an increased risk for CHD (Austin, Hokanson, & Edwards, 1998).

**How to Measure**: National Health and Nutrition Examination Survey (NHANES)

- Respondent demographic information
- Have you ever been told by a doctor or other health professional that your blood cholesterol was high?
- Measured: Blood draw: Triglycerides (Morning session participants only)

**Administrative Medical Records** reviews, including data abstracted from patient charts, electronic medical records, or registries

**Population Group**: Adults 18 years and older

**References**


† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within one point of the median for this criterion.
<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Average total cholesterol level among adults with high cholesterol (2.7.4)</th>
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<td>Priority Area</td>
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<tr>
<td>Logic Model Component</td>
<td>Intermediate Outcomes Box 7 – Reduced Levels Of Cholesterol</td>
</tr>
<tr>
<td>What to Measure</td>
<td>Average total cholesterol level among adults who specify that they have high cholesterol. Please see “Comment” below.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>Clinical trials have found that every one percent reduction in total cholesterol reduces risk for CHD by two percent (Executive Summary of the Third Report of the NCEP, 2001). Higher levels of total cholesterol are associated with onset of CHD in both men and women initially free of the disease and increased coronary events among those with established CHD.</td>
</tr>
<tr>
<td>How to Measure</td>
<td>National Health and Nutrition Examination Survey (NHANES)</td>
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<td>• Pertinent demographic information</td>
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<td></td>
<td>• Have you ever been told by a doctor or other health professional that your blood cholesterol was high?</td>
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<tr>
<td></td>
<td>• Measured: Blood draw: Total Cholesterol (Morning session participants only)</td>
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<tr>
<td></td>
<td>Administrative Medical Records reviews, including data abstracted from patient charts, electronic medical records, or registries</td>
</tr>
<tr>
<td>Population Group</td>
<td>Adults 18 years or older</td>
</tr>
<tr>
<td>Comment</td>
<td>Although total cholesterol may be a useful marker when full cholesterol panel information is not available (as may be the case in worksite or community screenings), utilizing LDL-C and HDL-C values is preferable</td>
</tr>
</tbody>
</table>
when this information is available.

References


Walden CE; Retzlaff BM; Buck BL; McCann BS; Knopp RH. Lipoprotein Lipid Response to the National Cholesterol Education Program Step II Diet by Hypercholesterolemic and Combined Hyperlipidemic Women and Men. *Arteriosclerosis, Thrombosis, and Vascular Biology* 1997;17(2):375–382.

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†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
LOGIC MODEL BOX 8:  
Increased Control of Cholesterol Levels Among Individuals with High Cholesterol

The relationship between LDL cholesterol levels and coronary heart disease (CHD) risk is continuous (NIH, 2002), and “elevated low-density lipoprotein cholesterol (LDL-C) is a major cause of coronary heart disease” (Fletcher et al., 2005). Additionally, the ATP III panel emphasized total cholesterol and HDL cholesterol as targets for cholesterol modification therapy because of their impact on CHD (NIH, 2002). More recently, it was discovered that non-HDL cholesterol was strongly associated with CHD risk as well (Emerging Risk Factors Collaboration, 2009). Ensuring that patients identified with high cholesterol and other CHD risk factors attain optimal recommended cholesterol goals decreases the risks of associated cardiovascular events and subsequently reduces mortality (Van Ganse et al., 2006).

Recent research has shown the importance of addressing disparities in cholesterol control and related cardiovascular risk among priority populations. For example, while disparities between whites and blacks in terms of cholesterol testing have diminished somewhat, disparities in the degree of cholesterol control have not moderated, suggesting that more needs to be done to help blacks achieve cholesterol goals (Trivedi et al., 2005). Additionally, increasing the proportion of post-menopausal women who achieve cholesterol goals is essential to reducing CHD risk. Women are more likely than men to die from a myocardial infarction within the first year following an event, yet women are still 55% less likely to participate in cardiac rehabilitation following a myocardial infarction (McCauley, 2007).

The intermediate outcome indicators for this component are:

2.8.1 Proportion of adults diagnosed with high cholesterol who have LDL cholesterol at or below goal as defined by current evidence-based guidelines

2.8.2 Proportion of adults diagnosed with high cholesterol who have HDL cholesterol at or above goal as defined by current evidence-based guidelines

2.8.3 Proportion of adults diagnosed with high cholesterol who have Non-HDL cholesterol at or below goal as defined by current evidence-based guidelines

2.8.4 Proportion of adults diagnosed with high cholesterol who have total cholesterol level at or below goal as defined by current evidence-based guidelines

2.8.5 Degree of disparities in high LDL cholesterol control between general and priority population

References


Proposed Indicator: Proportion of adults diagnosed with high cholesterol who have LDL cholesterol at or below goal as defined by current evidence-based guidelines (2.8.1)

Rating

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<tr>
<th>Overall Quality</th>
<th>Resources Needed</th>
<th>Scientific Evidence</th>
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Priority Area: Controlling High Cholesterol

Logic Model Component: Intermediate Outcomes Box 8 – Increased Control of Blood Cholesterol Levels

What to Measure: Proportion of adults diagnosed with high cholesterol who have achieved LDL at or below the appropriate goal given CHD risk. Please see “Comments” below for more information.

Why This Indicator is Useful: The Adult Treatment Panel III (ATP III) of the National Cholesterol Education Program guidelines established LDL cholesterol as the primary goal of lipid-altering treatment, noting, “elevated LDL cholesterol is a major cause of CHD. In addition, recent clinical trials robustly show that LDL-lowering therapy reduces risk for CHD” (Executive Summary of the Third Report of the NCEP, 2001, p. 2).

How to Measure: National Health and Nutrition Examination Survey (NHANES)

- Pertinent demographic information
- Have you ever been told by a doctor or other health professional that your blood cholesterol was high?
- Measured: Blood draw: LDL (Morning session participants only)

Administrative Medical Records reviews, including data abstracted from patient charts, electronic medical records, or registries

Health Plan Employer Data and Information Set (HEDIS®)

- Measure: Cholesterol Management for Patients with Cardiovascular Conditions, applicable to Medicaid, Commercial, Medicare, and PPO Defined as patients who were discharged alive for any of the following: acute myocardial infarction, coronary artery bypass graft, percutaneous...
transluminal coronary angioplasty

Or who had diagnosis of ischemic vascular disease

Patient should have each of the following during the measurement year:
LDL-C screening performed with LDL level < 100

<table>
<thead>
<tr>
<th>Population Group</th>
<th>Adults 18 years or older</th>
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</thead>
</table>

**Comment**

ATP II Classification of LDL

- <100 Optimal
- 100-129 Near optimal/above optimal
- 130-159 Borderline high
- 160-189 High
- ≥ 190 Very high

Major risk factors that Modify LDL Goals

- Cigarette smoking
- Hypertension (BP ≥mmHg or on antihypertensive medication)
- Low HDL cholesterol (<40 mg/dL)
- Family history of premature CHD (CHD in male first degree relative <55 years; CHD in female first degree relative <65 years)
- Age (men ≥ 45 years; women ≥ 55 years)

Three categories of Risk that Modify LDL Cholesterol Goals

- CHD and CHD risk equivalents, LDL Goal (mg/dL): <100
- Multiple (2+) risk factors, LDL Goal (mg/dL): <130
- Zero to one risk factor, LDL Goal (mg/dL): <130

**References**


Brown BG, Bardsley J, Poulin D, Hillger LA, Dowdy A, Maher VMG, Zhao X-Q, Albers JJ, Knopp RH. Moderate dose, three-drug therapy with niacin, lovastatin, and colestipol to reduce low-density lipoprotein cholesterol <100 mg/dL in patients with hyperlipidemia and coronary artery disease. *American Journal of Cardiology*


<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Proportion of adults diagnosed with high cholesterol who have HDL cholesterol at or above goal as defined by current evidence-based guidelines (2.8.2)</th>
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<tr>
<td>Rating</td>
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<tr>
<td>Priority Area</td>
<td>Controlling High Cholesterol</td>
</tr>
<tr>
<td>Logic Model Component</td>
<td>Intermediate Outcomes Box 8 – Increased Control of Blood Cholesterol Levels</td>
</tr>
<tr>
<td>What to Measure</td>
<td>Proportion of adults diagnosed with high cholesterol who have achieved HDL at or above goal as defined by ATP III guidelines. Please see “Comments” below for more information.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>Population studies show a continuous rise in risk for CHD as HDL-cholesterol levels decline. The increase in risk for CHD at lower HDL levels is complex and has multiple causes (Executive Summary of the Third Report of the NCEP, 2001).</td>
</tr>
<tr>
<td>How to Measure</td>
<td>National Health and Nutrition Examination Survey (NHANES)</td>
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<tr>
<td></td>
<td>- Pertinent demographic information</td>
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<tr>
<td></td>
<td>- About how long has it been since you last had your blood cholesterol checked?</td>
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<td></td>
<td>- Have you ever been told by a doctor or other health professional that your blood cholesterol was high?</td>
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<td>- Measured: Blood draw: HDL (Morning session participants only)</td>
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<td>Administrative Medical Records</td>
<td>reviews, including data abstracted from patient charts, electronic medical records, or registries</td>
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<td>Population Group</td>
<td>Adults 18 years or older</td>
</tr>
</tbody>
</table>
Comment

ATP II Classification of HDL

- <40 Low
- ≥ 60 High

References


Proposed Indicator: Proportion of adults diagnosed with high cholesterol who have non-HDL cholesterol at or below goal as defined by current evidence-based guidelines (2.8.3)

Rating: $\$\$\$\$\$\$\$

Overall Quality: \(\leftarrow\rightarrow\) high
Resources Needed: \(\leftarrow\bullet\bullet\bullet\bullet\rightarrow\) better
Scientific Evidence: \(\leftarrow\) low
Face Validity: \(\leftarrow\) low
Utility: \(\leftarrow\) low
Accepted Practice: \(\leftarrow\) low

Priority Area: Controlling High Cholesterol

Logic Model Component: Intermediate Outcomes Box 8 – Increased Control of Blood Cholesterol Levels

What to Measure: Proportion of adults diagnosed with high cholesterol who have non-high density lipoprotein cholesterol, the difference between the HDL-C concentration and the total cholesterol concentration, at or below the appropriate goal given CHD risk. Please see “Comments” below for more information.

Why This Indicator is Useful: Although current evidence-based guidelines identify LDL cholesterol as the primary target of lipid-altering therapy, recent evidence suggests that non-HDL cholesterol may be a strong predictor of ischemic cardiovascular events (Emerging Risk Factors Collaboration, 2009); however, its clinical applicability in the general population remains to be ascertained (Lau & Smith, 2009).

How to Measure: National Health and Nutrition Examination Survey (NHANES)

- Pertinent demographic information
- Have you ever been told by a doctor or other health professional that your blood cholesterol was high?
- Measured: Blood draw: Non-HDL cholesterol (Morning session participants only)

Administrative Medical Records reviews, including data abstracted from patient charts, electronic medical records, or registries
Population Group  Adults 18 years or older

Comments  In patients with elevated triglycerides (200-499 mg/dL), after achieving LDL-C goal, non-HDL-C is considered a secondary target of therapy (non-HDL-C goal = LDL-C goal + 30 mg/dL).

Monitoring non-HDL-C is of greater importance when assessing outcomes among populations at highest CHD risk. ATP III operationalizes CHD risk equivalents as comprising:

- Other clinical forms of atherosclerotic disease (peripheral arterial disease, abdominal aortic aneurysm, and symptomatic carotid artery disease)
- Diabetes
- Multiple risk factors that confer a 10-year risk for CHD >20%


† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within one point of the median for this criterion.

†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
### Proposed Indicator

**Proposition of adults diagnosed with high cholesterol who have total cholesterol level at or below goal as defined by current evidence-based guidelines (2.8.4)**

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<tr>
<th>Rating</th>
<th>Overall Quality</th>
<th>Resources Needed</th>
<th>Scientific Evidence</th>
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### Priority Area

**Controlling High Cholesterol**

### Logic Model Component

**Intermediate Outcomes Box 8 – Increased Control of Blood Cholesterol Levels**

### What to Measure

Proportion of adults diagnosed with high cholesterol who have total cholesterol at or below goal as defined by ATP III guidelines. Please see "Comments" below for more information.

### Why This Indicator is Useful

Clinical trials have found that every one percent reduction in total cholesterol reduces risk for CHD by two percent (Full Report of the Third Report of the NCEP, 2001). Higher levels of total cholesterol are associated with onset of CHD in both men and women initially free of the disease and increased coronary events among those with established CHD.

### How to Measure

**National Health and Nutrition Examination Survey (NHANES)**

- Pertinent demographic information
- Have you ever been told by a doctor or other health professional that your blood cholesterol was high?
- To lower blood cholesterol, have you ever been told by a doctor or other health professional to take prescribed medicine?
- Are you now following this advice to take prescribed medicine?
- Measured: Blood draw: total cholesterol (Morning session participants only)

**Administrative Medical Records** reviews, including data abstracted from patient charts, electronic medical records, or registries
Population Group  Adults 18 years or older

Comment  ATP III Classification of Total Cholesterol
- <200 Desirable
- 200-239 Borderline high
- ≥240 High

References


†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Degree of disparity in high LDL cholesterol control between general and priority populations (2.8.5)</th>
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<tr>
<td>Rating</td>
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<tr>
<td>Priority Area</td>
<td>Controlling High Cholesterol</td>
</tr>
<tr>
<td>Logic Model Component</td>
<td>Intermediate Outcomes Box 8 – Increased Control of Blood Cholesterol Levels</td>
</tr>
<tr>
<td>What to Measure</td>
<td>Degree of disparity in high blood cholesterol control between all adults diagnosed with high LDL cholesterol and those within priority groups.</td>
</tr>
<tr>
<td>Why This Indicator is Useful</td>
<td>Research shows that disparities in CVD and related risk factors remain pervasive. Racial/ethnic differences in disease severity are likely determined by unequal access to and treatment of uncontrolled hyperlipidemia (Mensah et al., 2005). African Americans have the highest overall CHD mortality rate among ethnic groups in the United States. Given that elevated LDL cholesterol is a major cause of CHD, assessing disparities in control of this therapeutic target is critical (Executive Summary of the Third Report of the NCEP, 2002, p. 2).</td>
</tr>
<tr>
<td>How to Measure</td>
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<td>• Pertinent demographic information</td>
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<tr>
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<td>• Have you ever been told by a doctor or other health professional that your blood cholesterol was high?</td>
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<tr>
<td>References</td>
<td>Abbott RD, Sharp DS, Burchfiel CM, Curb JD, Rodriguez BL, Hakim AA, et al. Cross-sectional and longitudinal changes in total and high-</td>
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LOGIC MODEL BOX 9:
Reduced Mortality and Morbidity Due to Cardiovascular Disease

Cardiovascular disease (CVD) is the leading cause of death among men and women in the United States (NCHS, 2002). An estimated one in three American adults has one or more types of CVD (Rosamond et al., 2007). Heart disease and stroke are the most common forms of CVD, accounting for nearly 35% of all annual deaths in the United States (AHA, 2009). High blood cholesterol is one of the major modifiable risk factors for heart disease (CDC, 2007). Currently, high cholesterol affects 105 million adults in the United States. It is estimated that a 10% reduction in total cholesterol levels in the United States population could result in an estimated 30% decrease in the incidence of coronary heart disease (CHD) (CDC, 2006). Therefore, tracking key indicators of cardiovascular morbidity and mortality will assist in assessing the long-term health impact of initiatives to reduce high blood cholesterol.

In addition to assessing acute cardiovascular events and mortality, it is important to understand the impact that CVD can have on an individual’s quality of life. A CDC study of health-related quality of life across a decade showed that while 16.1% of the overall population (including those with one or more chronic diseases) reported fair or poor health, 36.4% of people with coronary heart disease reported fair or poor health (Zahran et al., 2005). People with CHD also reported more unhealthy days per month (9.1) than the overall population (6.7). Additionally, high cholesterol in particular has shown a modest but significant relationship to health related quality of life in a hospital setting (Lalonde et al., 2001).

The long-term outcome indicators for reducing morbidity and mortality are:

2.9.1 Proportion of adults with high cholesterol who have elevated cardiovascular risk
2.9.2 Proportion of adults with high cholesterol who have poor quality of life
2.9.3 Prevalence of nonfatal cardiovascular events associated with high cholesterol
2.9.4 Death rate due to cardiovascular disease associated with high cholesterol

References


CDC. State heart disease and stroke prevention programs address high blood cholesterol. Atlanta, GA: Division for Heart Disease and Stroke Prevention—Centers for Disease Control and Prevention; 2007.


### Proposed Indicator

**Proportion of adults with high cholesterol who have an elevated 10-year cardiovascular risk (2.9.1)**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Overall Quality</th>
<th>Resources Needed</th>
<th>Scientific Evidence</th>
<th>Face Validity</th>
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**Priority Area**
Controlling High Cholesterol

**Logic Model Component**
Long-term Outcomes Box 9 – Reduced Mortality and Morbidity

**What to Measure**
Proportion of adults identified as having high cholesterol with elevated cardiovascular risk

**Why This Indicator is Useful**
Numerous studies emphasize optimizing cholesterol control as a key component of cardiovascular risk management. Many of these studies found that achieving target LDL cholesterol levels (<100 mg/dL) may be associated with reductions in cardiovascular disease risk scores (Austin et al., 2000; Farquhar et al., 1990; Henritze et al., 1992).

**How to Measure**
National Health and Nutrition Examination Survey (NHANES)

- Respondent demographic information
- Have you ever been told by a doctor or other health professional that your blood cholesterol was high?
- Measured: Blood draw: LDL, Blood Pressure
- Have you smoked at least 100 cigarettes in your entire life?
- Do you now smoke cigarettes?
- During the past 30 days, on the days that you smoked, about how many cigarettes did you smoke per day?

**Administrative Medical Records** reviews, including data abstracted from patient charts, electronic medical records, or registries

NHANES or administrative medical records can be used to estimate cardiovascular risk. Data culled from these sources can be put into the...

**Population Group**  
Adults ages 18 and over

**References**


### Proposed Indicator

**Proportion of adults with high cholesterol who have poor quality of life (2.9.2)**

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**Priority Area**

Controlling High Cholesterol

**Logic Model Component**

Long-term Outcomes Box 9 – Reduced Mortality and Morbidity

**What to Measure**

Proportion of adults with high cholesterol identified as having poor quality of life

**Why This Indicator is Useful**

Research demonstrates that patients with high cholesterol have lower health-related quality of life than the general population. Studies show that controlling cholesterol lowers heart disease and stroke risk and can improve a person’s functional status and quality of life (Fleischmann et al., 2004; Greenlund et al., 2002; Zahran et al., 2005). Patients suffering acute CV events including heart attack and stroke are particularly vulnerable to impaired functional status.

**How to Measure**

**Behavioral Risk Factor Surveillance System (BRFSS)**

- Have you EVER been told by a doctor, nurse or other health professional that your blood cholesterol is high?

  Healthy Days -- Health-Related Quality of Life, Core Module

- Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

- Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

- During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?
Population Group  Adults 18 and over.

Comments  Many validated surveys exist, such as the SF-36® Health Survey and the SF-12® Health Survey, which can be used to assess quality of life in a patient population with high cholesterol.


†† Denotes low agreement among expert reviewers. Less than 75% of valid ratings are within two points of the median for overall quality of the indicator.
### Proposed Indicator

**Prevalence of nonfatal cardiovascular events associated with high cholesterol (2.9.3)**

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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Long-term Outcomes Box 9 – Reduced Mortality and Morbidity

### What to Measure

Proportion of adults diagnosed with high cholesterol presenting to the emergency department or admitted for inpatient treatment with a primary diagnosis related to coronary heart disease, stroke, or other heart diseases

### Why This Indicator is Useful

Recent clinical trials in patients with established coronary heart disease indicate that lipid-lowering therapy (specifically with statins) significantly reduces risk for stroke by 27% to 31% (Blauw et al., 1997; Crouse, Byington, & Furberg, 1998; Hebert et al., 1997), coronary events by 25% to 31% (Wilt et al., 2004; LaRosa et al., 1999), and fatal coronary disease by 23% to 29% (Wilt et al., 2004; LaRosa et al., 1999).

### How to Measure

**State Inpatient Databases** contain clinical and nonclinical variables such as:
- Principal and secondary diagnoses
- Principal and secondary procedures
- Admission and discharge status
- Patient demographics

**State Emergency Department Databases** contain clinical and nonclinical variables such as:
- Principal and secondary diagnoses
- Principal and secondary procedures
- Patient demographics
National Hospital Discharge Survey collects medical and demographic information annually from a sample of hospital discharge records. Variables include:

- Patient demographic
- Surgical and nonsurgical procedures
- Dates of admission and discharge
- Sources of payment

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<tr>
<th>Population Group</th>
<th>Adults 18 and over</th>
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</table>

Comments
State HDSP programs may find it useful to break out hospitalizations/emergency care by different cardiovascular diseases using various codes from the International Classification of Diseases, Ninth Revision.

References


Jha, AK, Varosy, PD, Kanaya, AM. Differences in Medical Care and Disease Outcomes Among Black and White Women With Heart Disease. *Circulation* 2003;108:1089


### Proposed Indicator

**Death rate due to cardiovascular disease associated with high cholesterol (2.9.4)**

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<th>Rating</th>
<th>Overall Quality</th>
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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Long-term Outcomes Box 9 – Reduced Mortality and Morbidity

### What to Measure

Death rate attributed to cardiovascular disease including heart disease and stroke associated with high cholesterol

### Why This Indicator is Useful

Evidence demonstrates that high cholesterol leads to increased cardiovascular disease-related mortality (Agewall et al., 2001; Mensah et al., 2007; Rosen et al., 2007). Reductions in risk factors, including high cholesterol, result in decreased in cardiovascular disease mortality (Agewall et al., 2001; Stenestrand et al., 2001).

### How to Measure

**National Vital Statistics System** collects information from death certificates including:
- Primary and secondary causes of death
- Demographics

### Population Group

Adults 18 and over.

### References


LOGIC MODEL BOX 10:
Reduced Levels of Disparities in Cardiovascular Disease

Disparities in cholesterol-related cardiovascular disease (CVD) incidence, prevalence, and impact exist among population subgroups, with a disproportionate burden of death and disability from CVD among certain gender and racial/ethnic populations. Compared to any other population group in the United States, blacks/African Americans have the highest overall CVD mortality rates (AHA, 2008). Analysis of NHANES III data indicated that while whites had higher levels of LDL cholesterol, blacks had higher rates of stroke. This relationship disappeared when controlling for income, suggesting that low-income groups may be a higher priority for intervention than blacks/African Americans in general (Bravata et al., 2005). Coronary heart disease (CHD) is also a major cause of death in women aged 45 to 75 (AHA, 2008). Black/African American women in particular tend to have disproportionately high rates of CHD and hypercholesterolemia, yet they are less likely to receive aspirin or statin treatment or to control other risk cardiovascular risk factors (Jha et al., 2003).

The long-term outcome indicators for reducing disparity are:

2.10.1 Degree of disparity in cardiovascular morbidity associated with high cholesterol between general and priority populations

2.10.2 Degree of disparity in cardiovascular mortality associated with high cholesterol between general and priority populations

References


### Proposed Indicator

Degree of disparity in cardiovascular morbidity associated with high cholesterol between general and priority populations (2.10.1)

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#### Priority Area

Controlling High Cholesterol

#### Logic Model Component

Long-term Outcomes Box 10 – Reduced Levels Of Disparities

#### What to Measure

Degree of disparity in cardiovascular morbidity associated with high cholesterol between individuals in the general population and those within priority groups. See “comments” below for more information.

#### Why This Indicator is Useful

Evidence demonstrates that disparities in cardiovascular morbidity remain pervasive in the United States. Differences associated with high cholesterol have been attributed to a number of issues including access to care, treatment quality, and adherence to lipid-lowering medication regimens that result in variations in cholesterol control (Farquhar et al., 1990; Jha et al., 2003; Mensah & Brown, 2007; Mensah et al., 2005).

#### How to Measure

**Behavioral Risk Factor Surveillance System (BRFSS)**

- Pertinent demographic information
- Have you EVER been told by a doctor, nurse or other health professional that your blood cholesterol is high?
- Has a doctor, nurse, or other health professional EVER told you that you had any of the following?
  - A heart attack, also called a myocardial infarction?
  - Angina or coronary heart disease?
  - A stroke?

**National Health and Nutrition Examination Survey (NHANES)**

- Pertinent demographic information
• Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
• Have you ever had a severe pain across the front of your chest lasting for half an hour or more?
• Has a doctor or other health professional ever told you that you had congestive heart failure?
• Has a doctor or other health professional ever told you that you had coronary heart disease?
• Has a doctor or other health professional ever told you that you had angina, also called angina pectoris?
• Has a doctor or other health professional ever told you that you had a heart attack, also called myocardial infarction?
• Has a doctor or other health professional ever told you that you had a stroke?

National Health Interview Survey (NHIS)
• Pertinent demographic information
• Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
• Have you EVER been told by a doctor or other health professional that you had coronary heart disease?
• Have you EVER been told by a doctor or other health professional that you had angina, also called angina pectoris?
• Have you EVER been told by a doctor or other health professional that you had a heart attack (also called myocardial infarction)?
• Have you EVER been told by a doctor or other health professional that you had any kind of heart condition or heart disease (other than the ones I just asked about)?
• Have you EVER been told by a doctor or other health professional that you had a stroke?

State Inpatient Databases contain clinical and nonclinical variables such as:
• Principal and secondary diagnoses
• Principal and secondary procedures
• Admission and discharge status
• Patient demographics

State Emergency Department Databases contain clinical and nonclinical variables such as:
• Principal and secondary diagnoses
- Principal and secondary procedures
- Patient demographics

**Population Group**  Adults 18 and over.

**Comments**  Morbidity trends including hospitalizations related to high cholesterol, stroke and coronary heart disease are important to capture and analyze across specific populations.

**References**


<table>
<thead>
<tr>
<th>Proposed Indicator</th>
<th>Degree of disparity in cardiovascular mortality associated with high cholesterol between general and priority populations (2.10.2)</th>
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<td><strong>Logic Model Component</strong></td>
<td>Long-term Outcomes Box 10 – Reduced Levels Of Disparities</td>
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<tr>
<td><strong>What to Measure</strong></td>
<td>Degree of disparity in cardiovascular disease death rates between individuals in the general population and those within priority groups.</td>
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<tr>
<td><strong>Why This Indicator is Useful</strong></td>
<td>Reducing health disparities remains a major public health challenge in the United States. Although disparities exist across a number of domains, age-specific death rates for cardiovascular disease suggest that black adults had higher death rates at all ages compared with other ethnic/racial groups (Mensah et al., 2005).</td>
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<tr>
<td><strong>How to Measure</strong></td>
<td><strong>National Vital Statistics System</strong> collects information from death certificates including:</td>
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<td>• Primary and secondary causes of death</td>
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LOGIC MODEL BOX 11: Reduced Cost Associated with High Cholesterol

CVD imposes a substantial economic burden on the nation. The total estimated costs of CVD in 2008 is estimated to be $475.3 billion, which includes direct (i.e., cost of physicians, hospital, and nursing home services, medications) and indirect (i.e., lost productivity) costs (AHA, 2007). It is important to identify how the costs of treatment are allocated across payers because costs falling to individuals, especially those who are uninsured, present barriers to receiving timely treatment for high blood cholesterol (Ayanian et al., 2000). Delaying treatment or failure to comply with recommended therapies could consequently result in higher costs for heart disease and stroke treatment.

Analysis of hospital discharge data for 1979–2003 shows sizable increases in hospitalization for major CVD, including coronary heart disease (16%), stroke (29%), and chronic heart failure (174%) (Mensah & Brown, 2007). Spending due to hyperlipidemia alone has increased 89% from 1987 to 2002 (Thorpe et al., 2005). While CVD accounts for about 29% of total inpatient expenditures, it accounts for only 8% of total outpatient spending and 18% of prescription spending (Trogdon et al., 2007). Given the high cost of inpatient treatment in general, these data suggest that reducing risk factors such as high cholesterol through medication or counseling on preventive measures could have significant economic and health benefits.

Listed below are the indicators associated with this outcome box:

2.11.1 Average annual employer healthcare costs attributable to high cholesterol and related health outcomes

2.11.2 Average annual outpatient costs attributable to high cholesterol and related health outcomes

2.11.3 Average annual inpatient costs attributable to high cholesterol and related health outcomes

2.11.4 Average annual emergency department services attributable to high cholesterol and related health outcomes

References


## Proposed Indicator

**Average annual employer costs attributable to high cholesterol and related health outcomes (2.11.1)**

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### Priority Area
Controlling High Cholesterol

### Logic Model Component
Long-term Outcomes Box 11 – Reduced Cost Associated With High Cholesterol

### What to Measure
Average annual employer costs including medical care costs (expenses) and absenteeism costs attributable to high cholesterol. For additional information regarding specific measurement issues, see the “Comments” section below.

### Why This Indicator is Useful
A majority of health care costs for the under 65 population in the United States are paid by employers through employer-provided health insurance. However, employers are often unaware of the cost of chronic diseases. Work loss and societal costs among persons with cardiovascular disease is high (Druss et al., 2001). As employers grapple with rising health care costs, monitoring employer costs attributable to high cholesterol may provide motivation to institute policies that support cholesterol reduction among employees.

### How to Measure

- **Claims Data** from employer-provided health plans
- **Administrative Absenteeism Records** collected by employers

**Behavioral Risk Factor Surveillance System (BRFSS)**
- Pertinent demographic information
- Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?
- During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?
Work Limitations Questionnaire measures the degree to which employed adults are experiencing limitations on-the-job due to their health problems, and health-related productivity loss (presenteeism).

Population Group
Medical costs: adults age 18–65 and over with employer-provided health insurance; could include retirees or persons 65+ w/employer-provided health insurance (few but may be costly).

Absenteism: full-time employed adults age 18 and over (no restriction on insurance status).

Comments
Medical care costs (direct costs): Analyze medical claims for persons with diagnosis codes for hyperlipidemia, stroke, congestive heart failure, or related heart diseases. See "comments" below for a more comprehensive listing of health outcomes.

Absenteism costs (indirect costs): Analyze self-reported survey data on absenteeism, combined with self-reported data on having been diagnosed with high cholesterol. Calculation: (dollar value = per-capita days missed * average wage, adjusted/inflated to include the value of benefits)

State HDSP programs may find it useful to break out inpatient and outpatient care by different cardiovascular diseases using various codes from the International Classification of Diseases, Ninth Revision.

References


Sasser AC, Rousculp MD, Birnbaum HG, Oster EF, Lufkin E, Mallet D. Economic burden of osteoporosis, breast cancer, and cardiovascular
disease among postmenopausal women in an employed population.  
### Proposed Indicator

| Average annual outpatient costs attributable to high cholesterol and related health outcomes (2.11.2) |

### Rating

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### Priority Area

Controlling High Cholesterol

### Logic Model Component

Long-term Outcomes Box 11 – Reduced Cost Associated With High Cholesterol

### What to Measure

Average, per-capita costs of outpatient services (physician visits, ambulatory services) attributable to high cholesterol and related health outcomes. Tracking costs separately by payer (private insurance, Medicare, Medicaid, and the overall total) may be useful for evaluating program effects. For additional information regarding specific measurement issues, see the “Comments” section below.

### Why This Indicator is Useful

Examination of annual outpatient costs versus inpatient costs may serve as a marker for improvements in secondary preventive care and treatment.

### How to Measure

**Claims Data**

**MarketScan Databases** capture person-specific clinical utilization, expenditures, and enrollment across inpatient, outpatient, prescription drug, and carve-out from a selection of large employers, health plans, and government and public organizations.

### Population Group

Adults 18 and above

### Other Information:

Medical care costs (direct costs): Analyze medical claims for persons with diagnosis codes for hyperlipidemia, stroke, congestive heart failure, or related heart diseases.

State HDSP programs may find it useful to break out outpatient care by different cardiovascular diseases using various codes from the International Classification of Diseases, Ninth Revision.
**References**


### Proposed Indicator

**Average annual inpatient costs attributable to high cholesterol and related health outcomes** (2.11.3)

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**Priority Area**

Controlling High Cholesterol

**Logic Model Component**

Long-term Outcomes Box 11 – Reduced Cost Associated With High Cholesterol

**What to Measure**

Average, per-capita costs of inpatient services (hospital stays, skilled nursing facilities, hospice care) to high cholesterol and related outcomes. Tracking costs separately by payer (private insurance, Medicare, Medicaid, and the overall total) may be useful for evaluating program effects. For additional information regarding specific measurement issues, see the “Comments” section below.

**Why This Indicator is Useful**

Monitoring average annual inpatient costs captures major distribution of direct medical costs. Over time, this may capture shifts in where and how services are provided. Lends easily to analysis by payer.

**How to Measure**

**State Inpatient Databases** contain clinical and nonclinical variables such as:

- Principal and secondary diagnoses
- Principal and secondary procedures
- Admission and discharge status
- Patient demographics

**MarketScan Databases** capture person-specific clinical utilization, expenditures, and enrollment across inpatient, outpatient, prescription drug, and carve-out services from a selection of large employers, health plans, and government and public organizations.

**Population Group**

Adults 18 and above
Other Information:

Analyze medical claims for persons with diagnosis codes for hyperlipidemia, heart attack, stroke, congestive heart failure, or related heart diseases. State HDSP programs may find it useful to break out hospitalizations by different cardiovascular diseases using various codes from the International Classification of Diseases, Ninth Revision.

References


### Proposed Indicator

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<th>Average annual emergency department costs attributable to high cholesterol and related health outcomes (2.11.4)</th>
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#### Priority Area
Controlling High Cholesterol

#### Logic Model Component
Long-term Outcomes Box 11 – Reduced Cost Associated With High Cholesterol

#### What to Measure

Average, per-capita costs of emergency department (ED) services to high cholesterol and related outcomes. Tracking costs separately by payer (private insurance, Medicare, Medicaid, and the overall total) may be useful for evaluating program effects. For additional information regarding specific measurement issues, see the “Comments” section below.

#### Why This Indicator is Useful

There are substantial costs associated with heart disease and stroke treatment (Etemad and McCollam, 2005). One element of these costs is ED services. Over time, monitoring changes in average per capita ED services costs may indicate improved treatment or management of cardiovascular risks to prevent recurrent heart attack/stroke.

#### How to Measure

State Emergency Department Databases contain clinical and nonclinical variables such as:

- Principal and secondary diagnoses
- Principal and secondary procedures
- Patient demographics

#### Population Group
Adults 18 and above

#### Other Information:
Medical care costs (direct costs): Analyze medical claims for persons with diagnosis codes for hyperlipidemia, heart attack, stroke, congestive heart failure, or related heart diseases. State HDSP programs may find it useful to break out hospitalizations/ emergency care by different cardiovascular diseases using various codes from the International Classification of
Diseases, Ninth Revision.

References


Appendices
Appendix 1: Logic Model for Controlling High Cholesterol

Box 1 Healthcare System Changes:
- Adherence
- Efficiency
- Policies/Protocols/Tools

Box 2 Provider Changes:
- Awareness
- Adherence to Guidelines

Box 3 Workplace Changes:
- Policies/Protocols/Tools
- Environmental Changes

Box 4 Community Changes:
- Environmental Changes
- Policy/legislative Changes

Box 5 Individual Changes:
- Awareness
- Knowledge

Box 6 Risk Factor Reduction Through Lifestyle and Therapeutic Intervention

Box 7 Reduced Levels of High Cholesterol

Box 8 Increased Control of Cholesterol Levels Among Individuals with High Cholesterol

Box 9 Reduced Mortality and Morbidity Due to Heart Disease and Stroke

Box 10 Reduced Levels of Disparities in Heart Disease and Stroke

Box 11 Reduced Costs Associated with Heart Disease and Stroke:
- Individual
- Healthcare
- Employer
- Societal

Contextual Factors
- Socio-economic and demographic characteristics of the target population
- Participating organizations’ policies and practices
- Healthcare industry practice trends and policies
- Partnerships among patients, providers, healthcare organizations, and worksites
Appendix 2: Data Source Descriptions

There are many data sources and tools that can be used to collect data for more than one indicator. Data sources and tools are listed below in alphabetical order along with a brief description of each. Specific questions or data elements from the sources for measuring indicators are provided in each indicator profile.

<table>
<thead>
<tr>
<th>Data Source/Tool</th>
<th>Description</th>
<th>For More Information</th>
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<tbody>
<tr>
<td><strong>Adult Tobacco Survey (ATS)</strong></td>
<td>The ATS provides data on adult tobacco use, knowledge, attitudes and tobacco use prevention and control policies.</td>
<td>Office on Smoking and Health, Centers for Disease and Control and Prevention, (770) 488-5703</td>
</tr>
</tbody>
</table>
| **American Heart Association’s (AHA’s) Women’s Study** | The AHA’s Women’s Study is conducted every 3 years with a national random sample of women 25 years and older. The survey includes a standardized 38-item questionnaire with a mixture of Likert scale, open-ended, and recognition questions. Core questions remain the same but certain questions may vary from study to study depending on current interests or priorities during the time of administration. | Karen Robb  
American Heart Association  
214.706.1409  
karen.robb@heart.org |
<p>| <strong>Behavioral Risk Factor Surveillance System (BRFSS)</strong> | The BRFSS is a state-based system of health surveys that generate information about health risk behaviors, clinical preventive practices, and health care access and use primarily related to chronic diseases and injury. | <a href="http://www.cdc.gov/brfss/">http://www.cdc.gov/brfss/</a>                                   |
| <strong>Community Health Assessment and Group Evaluation (CHANGE) Tool</strong> | CHANGE is a community assessment tool developed by CDC’s Healthy Communities Program (formerly the Steps Program) within the Division of Adult and Community Health. The purpose of CHANGE is to conduct an assessment of community assets and potential areas for improvement. | <a href="http://www.cdc.gov/healthycommunitiesprogram/tools/change.htm">http://www.cdc.gov/healthycommunitiesprogram/tools/change.htm</a> |</p>
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<tr>
<th>Data Source/Tool</th>
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<tr>
<td>Georgia Worksite Health Promotion Policies and Practices Survey</td>
<td>The Georgia Worksite Health Promotion Policies and Practices Survey was conducted for the first time in 2002 and again in 2008. This cross-sectional survey was adapted from the 1999 National Worksite Health Promotion Survey. It consists of questions relating to worksite policies and environments affecting health practices of Georgia workers.</td>
<td><a href="mailto:WorksiteHealth@dhr.state.ga.us">WorksiteHealth@dhr.state.ga.us</a> <a href="mailto:GAepinfo@dhr.state.ga.us">GAepinfo@dhr.state.ga.us</a></td>
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<tr>
<td>Health and Retirement Study (HRS)</td>
<td>The HRS is a national longitudinal study based on core biennial interviews of nearly 20,000 individuals representing the US population over age 50. Hispanics and African-Americans are oversampled. Every six years, the HRS enrolls a new birth cohort in order to maintain a steady-state representation of the over 50 US population. Baseline interviews with existing birth cohorts were conducted in 1992, 1993, 1998, and 2004, with plans to enroll the next 6-year cohort in 2010. Participants are followed through the life course with biennial surveys and supplemental data collections. Data are de-identified and made publicly available at no charge to users.</td>
<td><a href="http://hrsonline.isr.umich.edu/">http://hrsonline.isr.umich.edu/</a></td>
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<tr>
<td>Health Plan Employer Data and Information Set (HEDIS®)</td>
<td>HEDIS® is a tool used by more than 90% of America's health plans to measure performance on important dimensions of care and service. Altogether, HEDIS consists of 71 measures across 8 domains of care. Because so many plans collect HEDIS data, and because the measures are so specifically defined, HEDIS makes it possible to compare the performance of health plans on an &quot;apples-to-apples&quot; basis.</td>
<td><a href="http://www.ncqa.org/tabid/59/Default.aspx">http://www.ncqa.org/tabid/59/Default.aspx</a></td>
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<tr>
<td>Heart Disease and Stroke Prevention (HDSP) Legislative Database</td>
<td>The HDSP Legislative Database is a centralized location for state heart disease and stroke prevention and control policies. Additionally, a mapping application was created so users of the database can map policies based on selected criteria. This function allows the user to see a visual representation of the policies nationwide with the ability to copy or print maps for other uses.</td>
<td><a href="http://apps.nccd.cdc.gov/DHDSPLeg/">http://apps.nccd.cdc.gov/DHDSPLeg/</a></td>
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<td><strong>Heart/Stroke Check</strong></td>
<td>The Heart/Stroke Check can be used as a planning guide and to assess if a worksite has incorporated services, programs, and interventions to prevent heart disease, stroke, and related risk factors such as high blood pressure and high cholesterol.</td>
<td>Dyann Matson-Koffman, <a href="mailto:dfm1@cdc.gov">dfm1@cdc.gov</a></td>
</tr>
<tr>
<td><strong>HERO Employee Health Management Best Practices Scorecard</strong></td>
<td>The HERO Employee Health Management (EHM) Best Practice Scorecard is intended to help employers, providers, and other stakeholders learn about and determine EHM best practice.</td>
<td><a href="http://www.the-hero.org/">http://www.the-hero.org/</a></td>
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<td><strong>MarketScan Databases</strong></td>
<td>The MarketScan Databases capture person-specific clinical utilization, expenditures, and enrollment across inpatient, outpatient, prescription drug, and carve-out services from a selection of large employers, health plans, and government and public organizations. The annual medical databases include private sector health data from approximately 100 payers. Historically, more than 500 million claim records are available in the MarketScan Databases. These data represent insured employees and their dependents for active employees, early retirees, COBRA continues, and Medicare-eligible retirees with employer-provided Medicare Supplemental plans.</td>
<td><a href="http://home.thomsonhealthcare.com/Products/view/?id=71">http://home.thomsonhealthcare.com/Products/view/?id=71</a></td>
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<td><strong>Massachusetts Worksite Health Improvement Survey</strong></td>
<td>The Massachusetts Worksite Health Improvement Survey was developed in 2008, with input from experts in health promotion and occupational health, to assess workplace practices with regard to promoting and protecting employee health and well-being.</td>
<td><a href="mailto:Heart.Stroke@state.ma.us">Heart.Stroke@state.ma.us</a></td>
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<tr>
<td>Data Source/Tool</td>
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<td><strong>National Ambulatory Medical Care Survey (NAMCS)</strong></td>
<td>NAMCS is a national survey designed to meet the need for objective, reliable information about the provision and use of ambulatory medical care services in the United States. Findings are based on a sample of visits to non-federally employed office-based physicians who are primarily engaged in direct patient care. The survey has been conducted annually since 1989.</td>
<td><a href="http://www.cdc.gov/nchs/ahcd.htm">http://www.cdc.gov/nchs/ahcd.htm</a></td>
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<td><strong>National Health and Nutrition Examination Survey (NHANES)</strong></td>
<td>NHANES is a national survey that captures information on the prevalence of selected diseases and risk factors; the population's awareness, knowledge, and attitudes; and prevention and control of selected diseases. The cross-sectional survey also includes a medical examination for participants and a laboratory component. The survey examines a nationally representative sample of about 5,000 persons each year. These persons are located in counties across the country, 15 of which are visited each year. The sample for the survey is selected to represent the U.S. population of all ages. To produce reliable statistics, NHANES over-samples persons 60 and older, African Americans, and Hispanics. Continuous data are available biennially from 1999 to present.</td>
<td><a href="http://www.cdc.gov/NCHS/nhanes">www.cdc.gov/NCHS/nhanes</a></td>
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<td><strong>National Health Interview Survey (NHIS)</strong></td>
<td>The NHIS is a nationally representative, cross-sectional survey that has been a principal source of information on the health of the civilian non-institutionalized population of the United States since 1957. NHIS data are collected through personal household interviews. Blacks, Asians, and Hispanics are oversampled.</td>
<td><a href="http://www.cdc.gov/nchs/nhis.htm">http://www.cdc.gov/nchs/nhis.htm</a></td>
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<td><strong>National Hospital Discharge Survey</strong></td>
<td>The National Hospital Discharge Survey collects medical and demographic information annually from a sample of hospital discharge records. Variables include patients' demographic characteristics, dates of admission and discharge, source and type of admission, status at discharge, final diagnoses, surgical and nonsurgical procedures, dates of surgeries, and sources of payment.</td>
<td><a href="http://www.cdc.gov/nchs/nhds.htm">http://www.cdc.gov/nchs/nhds.htm</a></td>
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<td>State Emergency Department Databases (SEDD)</td>
<td>The SEDD are a set of databases from participating states that capture discharge information on all emergency department visits that do not result in an admission. Information on patients initially seen in the emergency room and then admitted to the hospital is included in the State Inpatient Databases (SID). SEDD data files beginning in data year 1999 are available through the Healthcare Cost and Utilization Project (HCUP).</td>
<td><a href="http://www.hcup-us.ahrq.gov/db/state/sedddbdocumentation.jsp">http://www.hcup-us.ahrq.gov/db/state/sedddbdocumentation.jsp</a></td>
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<td>State Inpatient Databases (SID)</td>
<td>The SID contain inpatient discharge abstracts in participating states, translated into a uniform format to facilitate multi-state comparisons and analyses. Together, the SID encompass about 90 percent of all U.S. community hospital discharges. SID data files beginning in data year 1990 are available through HCUP.</td>
<td><a href="http://www.hcup-us.ahrq.gov/sidoverview.jsp">http://www.hcup-us.ahrq.gov/sidoverview.jsp</a></td>
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<td>Survey of Policies and Programs Related to Health For Cities and Towns in Massachusetts</td>
<td>The Survey of Policies and Programs Related to Health For Cities and Towns in Massachusetts was created in 2007 to assess municipal policies and programs related to health as well as measure the impact of land use and community design, identify community partnerships responsible for being catalysts to plan new structures and redesign existing ones, and evaluate the availability of policies or programs aimed at ensuring protection from toxins, access to healthy food outlets, places to walk and recreate, and other health-promoting environments.</td>
<td><a href="mailto:Heart.Stroke@state.ma.us">Heart.Stroke@state.ma.us</a></td>
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<td>Work Limitations Questionnaire (WLQ)</td>
<td>The WLQ measures the degree to which employed individuals are experiencing limitations on-the-job due to their health problems, and health-related productivity loss (presenteeism).</td>
<td><a href="http://160.109.101.132/icrhps/resprog/thi/wlq.asp">http://160.109.101.132/icrhps/resprog/thi/wlq.asp</a></td>
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The Division for Heart Disease and Stroke Prevention developed policy and system outcome indicators across the priority areas of the National Heart Disease and Stroke Prevention Program. The indicators are specific, observable, and measurable characteristics that show the progress being made toward achieving outcomes. This comprehensive set of indicators can be used for program planning and evaluation by state Heart Disease and Stroke Prevention programs as well as their partners.