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ABSTRACT

This guide presents an overall direction for mass media messages and materials developed for public audiences under the National Cholesterol Education Program (NCEP), with particular emphasis on overall consistency and coherence in broadcast and print materials. Section 1 introduces the program and presents overall objectives, purpose, and scope of the communications strategy; recent NCEP developments influencing the strategy; scientific basis for the strategy; public knowledge basis for the strategy; and role of the mass media campaign. Section 2 states the problem in detail using data from the third National Health and Nutrition Examination Survey (1988-91). This section presents a two-pronged strategy, with one prong aimed at the total population and the other at the high risk groups. Section 3 reviews important considerations for public education efforts, especially the general population's knowledge level regarding nutrition. Section 4, which deals with target audiences, specifies that the high risk treatment population is defined on the basis of LDL-cholesterol levels. Section 5 lists communications objectives and strategies for both the general population and high-risk groups. Section 6 lays out the desired resulting actions for both groups. Section 7 presents conclusions and notes anticipated future changes in public knowledge, health behavior, and education. (JB)

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE HEALTH COMMUNICATIONS SERIES



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# The National Cholesterol Education Program



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A COMMUNICATIONS STRATEGY FOR PUBLIC EDUCATION

# The National Cholesterol Education Program

National Heart, Lung, and Blood Institute

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Institutes of Health

NIH Publication No. 94-3292
November 1994

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# 1.

# INTRODUCTION

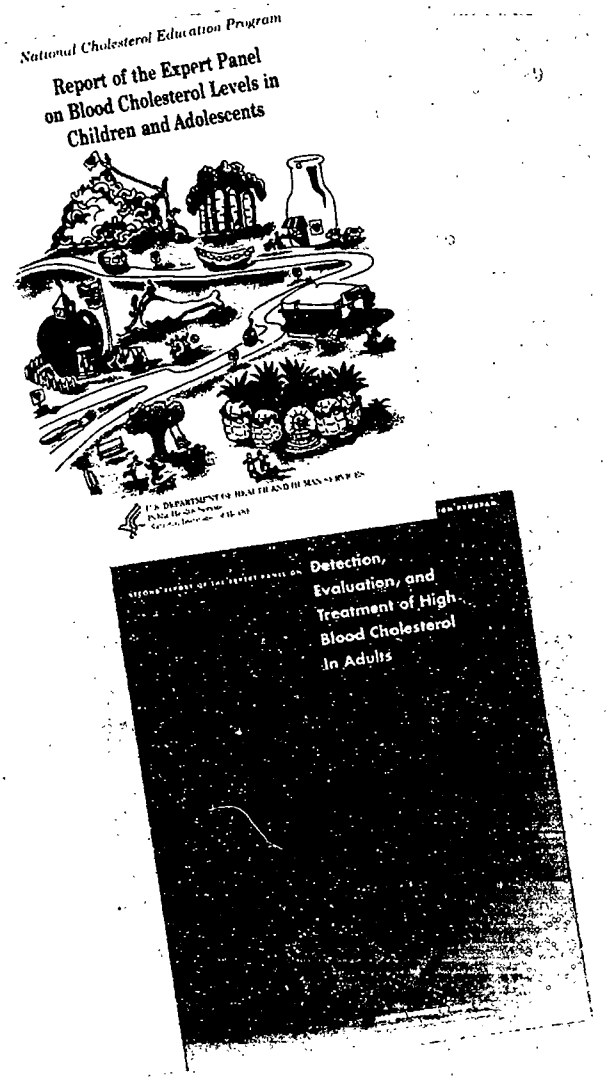
## Background and Overall Program Objectives

In November 1985, the National Heart, Lung, and Blood Institute (NHLBI) established the National Cholesterol Education Program (NCEP). The goal of this program is to help reduce illness and death from coronary heart disease by reducing the proportion of Americans with high blood cholesterol. The NCEP is built on principles derived from NHLBI's experience with the National High Blood Pressure Education Program: a solid science base, and partnership with a wide array of cooperating organizations. The NCEP's coordinating committee, comprised of representatives of over 40 professional and voluntary organizations interested in cholesterol education and control, is the program's policy setting body. The NCEP's recommendations are developed by panels of experts under the aegis of the coordinating committee, and are then endorsed by that committee. Thus, the recommendations of the NCEP represent a consensus of professionals in the cardiovascular field.

The NCEP targets its messages to professionals, patients, and the public. This strategy statement outlines an approach for the mass media component of public education.

## Purpose and Scope of the Communications Strategy Statement

This communications strategy statement expresses tne overall direction for mass media messages and materials developed for public audiences under the NCEP.[1] In addition, other health officials in Federal, State, and local governments, as well as private sector health organizations, are encouraged to use the statement as a basis for their own mass media efforts on cholesterol and heart disease. While the strategy statement is designed to support overall consistency and coherence and to provide general direction for developing broadcast and print materials for the general public, it is not intended as a set of guidelines for a specific mass media campaign.

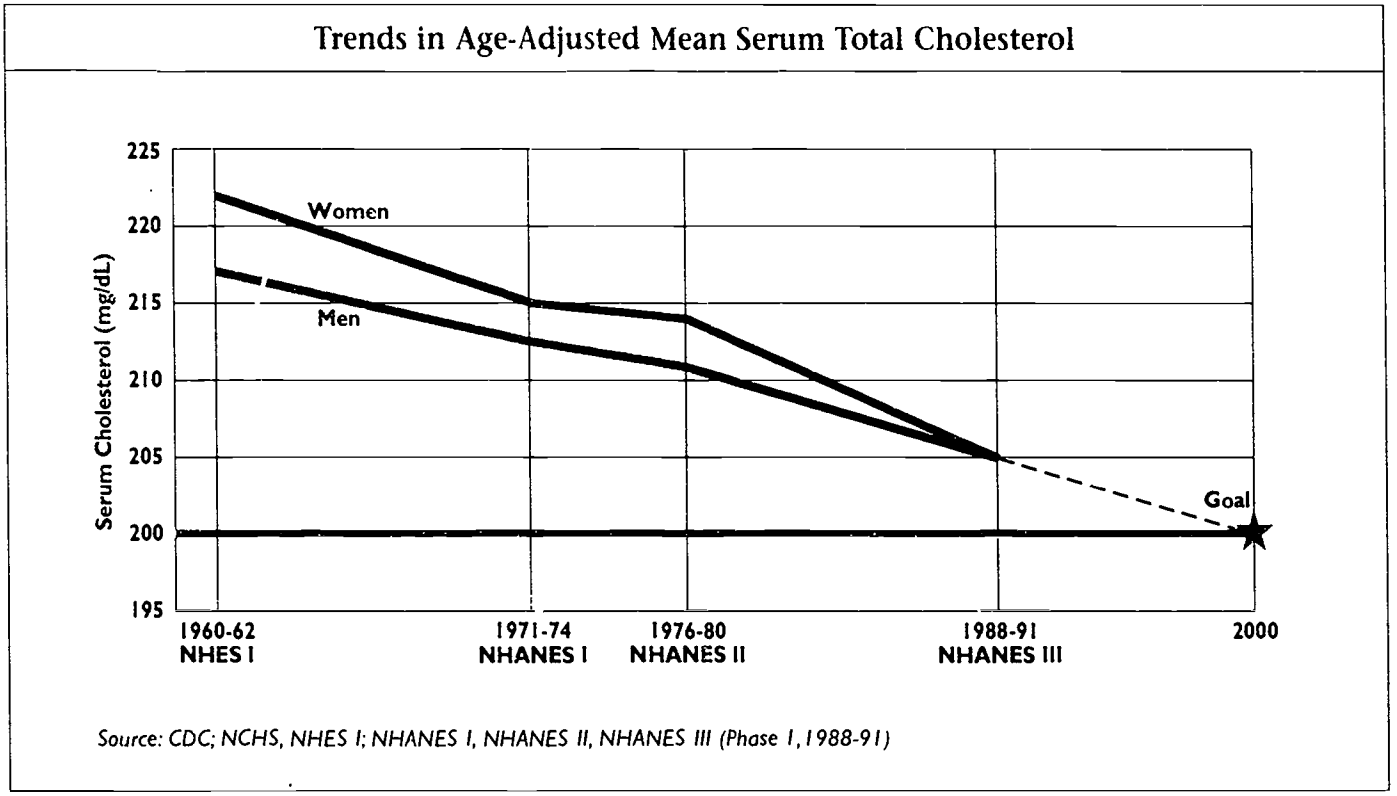



**The NCEP's expert panel reports are distributed to physicians and other health care professionals across the country.**

## Recent NCEP Developments Influencing the Strategy

NCEP's first strategy statement was written in 1986. This 1994 update reflects several important developments since that time:

- The Adult Treatment Panel (ATP)[2] developed the first set of guidelines, published in January 1988, to help physicians in identifying patients who have high blood cholesterol and treating them with dietary and (if necessary) drug regimens.
- The Population Panel[3] in its 1990 report recommended that the NCEP's cholesterol-lowering efforts go beyond identifying and treating those at high risk, to encourage healthy Americans to lower their blood cholesterol levels by adopting low-saturated fat, low-total fat, and low-cholesterol eating patterns.
- The report of the Children and Adolescents Panel,[4] released in April of 1991, recommended that children over the age of 2 adopt an eating pattern low in saturated fat and cholesterol, and that children in high-risk families have their blood cholesterol levels measured.
- The 1990 Cholesterol Awareness Survey (CAS) of the public[5] showed that public knowledge, awareness, and behavior related to high blood cholesterol has improved dramatically and continues to move in a positive direction. (The NHLBI has also sponsored Cholesterol Awareness Surveys of Physicians.)
- In June of 1993, the NCEP released an update of the guidelines on detection, evaluation, and treatment of high blood cholesterol in adults. This second report of the Adult Treatment Panel, known as ATP II,[6] called for:
  - —More aggressive treatment of patients with coronary heart disease or other atherosclerotic disease;




This figure shows the drop in average levels of total blood cholesterol in the United States.

—Consideration of a person's age, as well as sex, in choosing therapy;

—Determination of HDL cholesterol, together with total cholesterol, as part of initial testing (provided that accurate test results are available); and

—Increased emphasis on physical activity and weight loss in the overweight in combination with dietary therapy as the first-line treatment of high blood cholesterol.

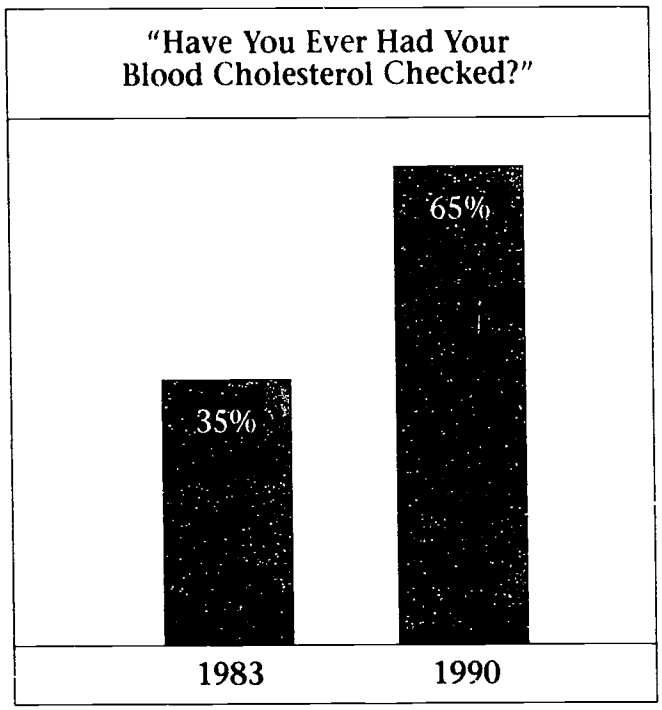
▶ Results from the third National Health and Nutrition Examination Survey (NHANES III)[7] released in June of 1993 indicate that average blood cholesterol levels in the United States have dropped significantly in the last 12 years. Between 1978 and 1990, the average total cholesterol level in the U.S. dropped from 213 mg/dL to 205 mg/dL; the average LDL-cholesterol level declined from 136 mg/dL to 128 mg/dL; and the percentage of people with high total cholesterol levels (≥240 mg/dL) declined from 26 percent to 20 percent. In addition, there was a significant drop in the percentage of people with high blood cholesterol needing dietary therapy—from 36 percent in 1978 to 29 percent in 1990.

These findings indicate the success of the NCEP's two-pronged approach: a population-based strategy targeted to the general U.S. population and a high risk strategy which seeks to identify and treat people with high blood cholesterol.

## Scientific Basis for the Strategy

### *Prevalence of Coronary Heart Disease*

Despite tremendous progress in detection, treatment, prevention and education, coronary heart disease remains the number one killer of men and of women in the United States. Each year, more than 1.25 million heart attacks occur,[8] and CHD causes almost 500,000 deaths




**There has been a substantial increase in the number of people who have had their blood cholesterol checked.**

annually.[9] About 12 million Americans have CHD, according to the third National Health and Nutrition Examination Survey. In 1991, there were 407,000 coronary bypass procedures performed in the U.S. and 303,000 angioplasty procedures. During that same year, there were also 2 million hospital discharges for CHD, about the same as in 1981.[10]

### *Scientific Evidence of Link Between Coronary Heart Disease and High Blood Cholesterol*

The NCEP's education efforts are based on scientific evidence of relationships between diet, high blood cholesterol levels, and CHD.

Results of animal, genetic, epidemiologic, and clinical investigations strongly support a causal relationship between elevated blood cholesterol levels and CHD. Epidemiological and clinical trials have been especially influential in supporting the connection between blood cholesterol and CHD. The Framingham Heart Study, which began over 40 years ago and continues today, provided epidemiological evidence that an elevated blood cholesterol level is a risk factor in coronary heart disease. The followup of the over 360,000 men screened for the Multiple Risk Factor Intervention Trial (MRFIT) showed a significant increase in mortality from heart disease for men with cholesterol levels above 240 mg/dL as compared to those with levels below 200 mg/dL. Moreover, the MRFIT followup demonstrated that the risk of death from heart disease begins to increase as blood cholesterol levels rise from as low as 180 mg/dL.

Confirmation that reducing high blood cholesterol will reduce one's risk of CHD has come from a variety of studies, including the Coronary Primary Prevention Trial (CPPT), a randomized double-blind study of 3,806 middle-age men with blood cholesterol levels of 265 mg/dL or greater. This study was conducted by NHLBI between 1976 and 1983. The CPPT indicated that a 1 percent reduction in total blood cholesterol translates into a 2 percent reduction in risk of heart disease.[11]

The Helsinki Heart Study, another primary prevention trial (i.e., a study of patients without evidence of coronary heart disease), found that patients taking a lipid-lowering drug called gemfibrozil experienced a reduction in LDL cholesterol, an increase in HDL cholesterol, and a 34 percent lower rate of coronary heart disease than a control group. Within the last several years, additional studies have demonstrated the benefit of lowering blood cholesterol levels. These include the Cholesterol-Lowering Atherosclerosis Study (CLAS),[12] the Program on the Surgical Control of the Hyperlipidemias (POSCH),[13] the Familial Atherosclerosis Treatment Study (FATS),[14] and the Treatment of Familial Hypercholesterolemia with Combined Drug Regimens Study.[15]

CLAS showed that a rigorous diet and treatment with drugs led to a 43 percent reduction in LDL cholesterol levels and a 37 percent increase in HDL cholesterol levels. These lipid changes resulted in less progression and some regression of the patients' atherosclerosis. The POSCH study showed that partial ileal bypass surgery reduced blood

cholesterol. Lowered blood cholesterol was associated with slowed progression of coronary heart disease and with reduced CHD risk. FATS established that when intensive therapy was used to modify lipid levels, the progression of atherosclerosis was significantly reduced and the regression (or reversal) of atherosclerosis was increased. In the combined drug regimens study, cholesterol-lowering drug treatment of patients with familial hypercholesterolemia produced a 38 percent reduction in blood levels of LDL cholesterol. This reduction in LDL levels was associated with regression of atherosclerotic plaques in the coronary arteries. Treatment benefitted women and men alike. In addition, a recent meta-analysis has shown that cholesterol lowering in patients with coronary heart disease significantly decreases the risk of a future heart attack and probably prolongs life. Untreated patients with CHD have a 5 to 7 times higher risk of a heart attack than the average person.

Numerous laboratory, epidemiological, and clinical studies conducted in the 1960s, 1970s, and early 1980s have highlighted the role of diet—specifically the role of saturated fatty acids and cholesterol—in the development of atherosclerosis.[16] These studies and others form the basis for and are referenced in the ATP and population panel reports, and will provide detailed evidence of the science base for those interested.

Not only is this science base strong, there has been an increasing professional consensus on the detection, evaluation, and treatment of high blood cholesterol. This has been demonstrated in the Cholesterol Awareness Surveys sponsored by the NHLBI and the Food and Drug Administration.

These surveys have regularly queried on average 1,600 practicing physicians on their attitudes and practices regarding high blood cholesterol. In the 1990 survey, more than 90 percent of physicians reported awareness and use of the ATP guidelines in their management of patients with high blood cholesterol.

## Public Knowledge Basis for the Strategy

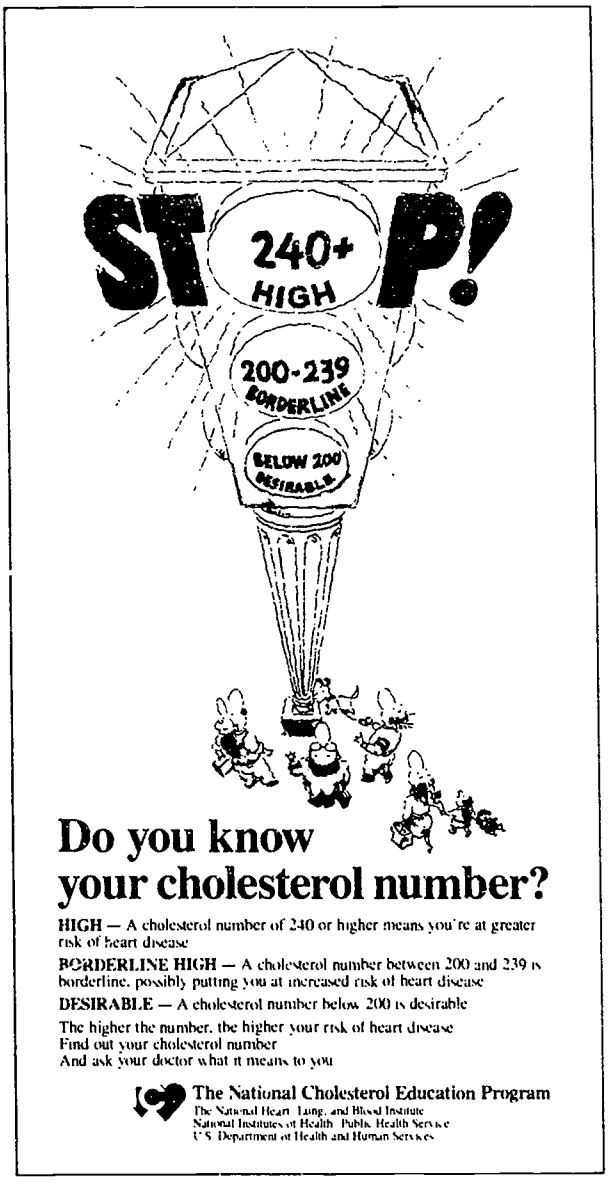
It is not enough to create messages based on scientific consensus—it is critical to provide messages that the audience will understand, that they will care about, and that they can act upon. To accomplish this, the NHLBI's public education efforts have successfully employed the principles of social marketing. These principles state that the consumer should be the central focus for planning and conducting a health education program. The social marketing process begins with a comprehensive understanding of the target audience so that strategies are based on their wants and needs.

Great strides have been made in public awareness, knowledge, attitudes, and behaviors about cholesterol since the inception of the NCEP. The Cholesterol Awareness Surveys conducted in 1983, 1986, and 1990 track this progress. (Unless otherwise noted, public knowledge data cited in this document is drawn from the CAS.)

In 1983, 64 percent of the public respondents said that lowering high blood cholesterol would have a "large effect" on heart disease. By 1986, this increased to 72 percent, and by 1990 to 74 percent. In 1983, 35 percent of those surveyed had ever had their blood cholesterol level checked, but only 3 percent knew their number. This increased to 46 percent having their level checked and 7 percent knowing their number in 1986. The 1990 survey showed even more progress, with 65 percent having had their level checked, 51 percent within the past year, and 37 percent knowing their number.

The CAS tracking data also show that overall the public's awareness, perceptions, and behavior regarding high blood cholesterol are moving in a positive direction:

- Knowledge of what constitutes a desirable blood cholesterol level quadrupled from 1986 to 1990;




**This popular NCEP print PSA was published in magazines and newspapers across the country.**

- Recognition of the role of diet in heart disease is well-established and knowledge of dietary changes that could be made to lower blood cholesterol is increasing.

Although these gains are impressive, there is still much work to be done to change public attitudes and practices.

- One-third of the population still reports that they have not had their cholesterol level checked.
- While knowledge about dietary influence on blood cholesterol has improved, it is less clear to what extent dietary change is occurring.
- One-third of the population is less than fully convinced that eating less saturated fat and cholesterol will have a large effect on CHD.

In addition to CAS data, this document also incorporates qualitative findings from six focus groups held in 1989 in Greenbelt, Maryland, and eight focus groups held in Baltimore and Philadelphia in 1993. Focus groups are a qualitative research technique useful for gaining insights into the knowledge, perceptions, and behavior of people on a specific topic. The groups are usually composed of 8 to 10 people, and discussions are guided by a trained moderator. Because of the small sample size, the results of focus groups cannot be projected to the population at large. The 1989 focus groups explored the attitudes of small groups of individuals about risk factors in heart disease, including high blood cholesterol. The 1993 focus groups assessed reactions to different approaches to the NCEP's communication strategy. The additional insights into public awareness, knowledge, attitudes, and behaviors gleaned from focus groups are cited throughout this document in the segments titled "Opportunities," "Barriers," and "Objectives and Strategies."

## Role of the Mass Media Campaign

The NCEP's education efforts involve programs of professional, patient, and public education designed to reduce the risk of heart disease. An important component of the NCEP's public education activities is the mass media campaign.

Mass media efforts have played an important role in putting cholesterol on the national agenda. The specific mass media that have been used for NCEP are public service announcements in television, radio, magazines, newspapers, and airports. Messages placed in these types of media cannot by themselves bring about behavior change but they can accomplish the following things: raise awareness, place an issue on the public's "mental agenda," educate/increase knowledge, influence attitudes, reinforce existing perceptions, and generate inquiries.

Mass media are used for two important reasons: 1) they can cast a very "wide net," reaching the broadest audience possible, and 2) communications research has shown that the public obtains much of their health information from these sources. For public education efforts, the mass media campaign can be expected to help:

- ▶ Create and reinforce awareness of the benefits of lowering high blood cholesterol levels in lowering the risk of heart disease;
- ▶ Create and increase public awareness of the threshold numbers for blood cholesterol levels and the need for everyone to be aware of their own level;
- ▶ Create and increase knowledge of general principles of reducing blood cholesterol levels through diet.

For all its power to persuade, transfer knowledge, and teach, the mass media alone cannot produce large changes in behavior. Ultimate success in changing the behavior of Americans toward high blood cholesterol will only come by coordinating mass media efforts with public and professional education, so that all messages work together to reinforce one another. The NCEP, through its broad network of national medical and voluntary organizations, State health departments, and other intermediary groups, is seeking to change public and professional perceptions and behavior through comprehensive education programs operating on many levels. Of course, increasing availability of good-tasting foods that are lower in saturated fatty acids, total fat, and cholesterol will also help change behavior.

**The NCEP's first public service advertising campaigns were designed to reinforce awareness of the benefit of lowering high levels of blood cholesterol to lower the risk of heart disease and also to encourage people to get their cholesterol checked. The audience was told to "have your cholesterol level checked and know what your number means to you." Later, when the *NCEP Report of the Expert Panel on Population Strategies for Blood Cholesterol Reduction* was released, the message was expanded to include heart-healthy diet issues. Early NCEP PSAs were directed to adults. With the release of the *NCEP Report of the Expert Panel on Blood Cholesterol Levels in Children and Adolescents* in April 1991, a family/children theme was incorporated to encourage heart-healthy eating. As cholesterol awareness and detection increase, the NCEP's messages are likely to be aimed at specific audiences. This would be similar to the way the National High Blood Pressure Education Program moved from a focus on awareness and detection in the general population to messages aimed at aware hypertensives.**

# 2. STATEMENT OF THE PROBLEM

## A Population At Risk

According to data from the third National Health and Nutrition Examination Survey (NHANES III), (1988-91), there is substantial prevalence of high blood cholesterol among men and women of all races across all age groups. In general, the prevalence of high blood cholesterol increases with age; differences occur between men and women in any given age group.[17]

Data from NHANES III show that the average cholesterol level of adult Americans is 205 mg/dL. One-fifth (20 percent) of adult Americans have total blood cholesterol levels of 240 mg/dL or above. Slightly over 30 percent have cholesterol levels of 200-239 mg/dL, which means that over half of the population has cholesterol levels higher than desirable (i.e., 200 mg/dL or above).

About 20 percent of the population has levels of 240 mg/dL or above. This group has a disproportionate share of the CHD burden. However, the remaining 80 percent of the population—individuals with blood cholesterol levels below 240 mg/dL—accounts for 50 to 60 percent of all deaths from heart disease. This is because there are many individuals in this group. Even moderately elevated cholesterol levels increase the risk of CHD, and other risk factors (smoking, diabetes, high blood pressure, and obesity) also play a role.

In other words, while a blood cholesterol level of 240 mg/dL puts one at high risk of developing heart disease, a substantial fraction of the population is at moderate risk, and almost everyone is at some risk.

The Adult Treatment Panel identified three key benchmark total cholesterol levels: desirable (below 200 mg/dL); borderline-high (200-239 mg/dL); and high (240 mg/dL or above). Recent surveys indicate that the public is becoming increasingly aware of these classifications.

However, while the 1990 CAS showed that 65 percent of respondents had their cholesterol checked, only 37 percent of

those surveyed knew their number and only 16 percent of all respondents had been told their level was high (vs. about 20 percent who have levels 240 mg/dL and above).

## A Two-Pronged Strategy for Lowering Blood Cholesterol Levels in the U.S.

Based on the scientific evidence, the Adult Treatment Panel and the Population Panel of the NCEP have recommended a two-pronged strategy for lowering blood cholesterol levels in the U.S. This strategy involves a clinical or high-risk and a population approach.

### *High-Risk Approach*

The high-risk approach seeks to identify and treat individuals with high blood cholesterol levels who have a high risk of coronary heart disease:

- About 29 percent of the population is at high risk of a future coronary heart disease event because they already have CHD or because they have high blood cholesterol levels, or borderline-high levels together with other CHD risk factors.
- Scientific evidence confirms that reducing a high blood cholesterol level reduces the risk of heart disease.
- High blood cholesterol is a silent condition. Detecting people at high risk requires that the adult population and children from high-risk families be encouraged to have their blood cholesterol levels checked.
- Since the ATP reports have been released, physicians have clear, consistent guidelines on how to treat high-risk patients.

The high-risk approach calls for all adults age 20 and above to have their total cholesterol measured at least once every 5 years. HDL cholesterol should be measured at the same time if accurate results are available.

As mentioned previously, ATP I established a classification system for desirable, borderline-high, and high blood cholesterol levels. The ATP II also establishes guidelines for recommended followup based initially on the patient's total and HDL cholesterol levels and, if treatment decisions have to be made, based on the patient's LDL cholesterol level. ATP II emphasizes dietary treatment as the primary approach to treating patients with high cholesterol levels. The first-line, Step I diet (as described in ATP II) calls for a saturated fat intake of 8 to 10 percent of calories, a total fat intake of 30 percent or less of calories, and dietary cholesterol intake of less than 300 mg/per day. The Step II diet calls for further reductions in saturated fat and cholesterol. ATP II also provides guidelines for drug therapy, if dietary treatment is unsuccessful.

### *Population Approach*

The population approach seeks to lower average blood cholesterol levels by encouraging all Americans over the age of 2 to consume lower amounts of saturated fatty acids, total fat, and cholesterol:

- Elevated blood cholesterol is a major cause of CHD. The higher a person's level of blood cholesterol, the higher the risk of heart disease. This was demonstrated by the Framingham Heart Study and the analysis of the screenees for the MRFIT study, among others.
- The risk of heart disease is not limited to those with high blood cholesterol. The 80 percent of the population with cholesterol levels below 240 mg/dL accounts for about half of all deaths from coronary heart disease.
- The average cholesterol level of U.S. adults is too high, at 205 mg/dL. In addition, this level is higher in the older population. For example, at ages 55 to 64, the average cholesterol level for men is 221 mg/dL; for women, the average level is 237 mg/dL.

## "Ducks": 30

**1ST DUCK:** Bill, I'm worried.

**2ND DUCK:** Why honey? Those hunters haven't been around here in months.

**1ST:** No, I'm worried about your cholesterol level. I don't want you to have a heart attack.

**2ND:** But honey, I'm a duck!

**1ST:** Heredity is only part of it. You've also got to watch what you eat. Like not stuffing yourself with food high in saturated fats and cholesterol.

**2ND:** Next thing, you'll want me to give up my poker night.

**ANNCR:** Watch what you eat as if your life depended on it. It does.

**SUPER:** It's your heart. It's your life. It's your move.
National Cholesterol Education Program
National Heart, Lung, and Blood Institute

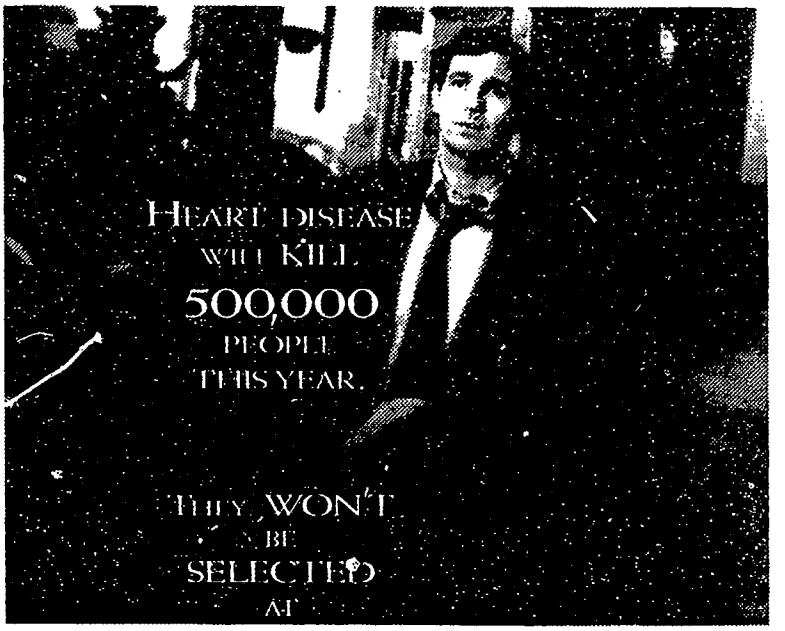
**1ST DUCK:** (WITH DUCKLINGS TRAILING)
If you won't do it for yourself, do it for the kids.

- Heart-healthy (i.e., low-saturated fat, low-total fat, low cholesterol) eating reduces blood cholesterol levels and thus reduces the risk of heart disease. This same eating pattern can help reduce the risk of other chronic diseases, such as some types of cancer.
- Everyone can benefit from messages that encourage heart-healthy eating.
- A secondary benefit of the population approach is that exposure to these messages will help educate the high-risk audience and supply social reinforcement for compliance with treatment.
- The population approach is cost effective, particularly[18] when compared with the projected benefits of this approach.

The Population Panel recommended the following pattern of nutrient intake for all healthy Americans above the age of 2: less than 10 percent of total calories from saturated fatty acids, an average of 30 percent of total calories or less from all fat, less than 300 mg of cholesterol per day, and calorie levels needed to reach or maintain a desirable body weight. The panel's other recommendations were:

- Healthy Americans, both adults and children, should select, prepare, and consume foods that contain lower amounts of saturated fatty acids, total fat, and cholesterol.
- The public should recognize that an elevated blood cholesterol level is one of the important modifiable coronary heart disease risk factors together with smoking, high blood pressure, excess body weight, and physical inactivity.

The first television PSA following the release of the *NCEP Report of the Expert Panel on Blood Cholesterol levels in Children and Adolescents* discusses the value of eating heart-healthy foods for the whole family.




Do you know your cholesterol number?

National Cholesterol Education Program
National Heart, Lung, and Blood Institute, National Institutes of Health, Public Health Service, U.S. Department of Health and Human Services

This ad is typical of materials developed for NCEP's population approach.

- Healthy children should follow the recommended eating patterns as they begin to eat with the family, usually at 2 years of age or older.

In addition, the panel addressed the nutritional concerns of special groups, including women and the elderly. The panel's report also contained recommendations for health professionals, the food industry, mass media, government, and educational systems to help attain the recommended eating patterns. The report also reinforced the ATP recommendation that all American adults have their blood cholesterol measured at least once every 5 years.

The NCEP's Expert Panel on Blood Cholesterol Levels in Children and Adolescents also recommended a two-pronged strategy: a population approach to lower average cholesterol levels and an individualized approach to identify and treat those at highest risk of heart disease in adulthood. The panel's review of the scientific evidence showed that atherosclerosis begins in childhood and that this process is related to nutrition practices which affect blood cholesterol levels both in children and in adults.

The population approach for children and adolescents calls for population-wide changes in nutrient intake and eating patterns. The Children's Panel established the same guidelines for saturated fat, total fat, and cholesterol intake as did the Population Panel. As part of the high-risk approach, the Children's Panel recommended selectively screening, in the context of regular health care, children and adolescents who have a family history of premature cardiovascular disease (before age 55) in a parent or grandparent, or at least one parent with *high* blood cholesterol (≥240 mg/dL).

# 3. IMPORTANT CONSIDERATIONS FOR PUBLIC EDUCATION EFFORTS

Despite growing public awareness about blood cholesterol levels and their meaning, there are still knowledge deficits and many Americans are not yet aware of their own risk for heart disease and may not have changed their diet to lower their blood cholesterol levels. In addition, only about one-third of coronary heart disease patients are being treated to lower their cholesterol level.

Future educational efforts can build on the progress made to date. Many of the indications of the public's progress signal opportunities that ongoing communication strategies can take advantage of.

The following two sections will highlight examples of progress and identify specific areas requiring more educational emphasis.

## The Public's Progress

***Widespread awareness of the relationship between high blood cholesterol and heart disease.***

- **Very high awareness of the condition called "high blood cholesterol":** In the 1990 survey, when asked if they had heard of the condition high blood cholesterol, 93 percent said "yes," up significantly from 81 percent in the 1986 survey.
- **Increasing belief in the benefit of lowering high blood cholesterol levels to prevent heart disease:** The public is well aware of the efficacy of reducing the three major modifiable risk factors—smoking, high blood pressure, and high blood cholesterol—to prevent heart disease. In 1983, 64 percent of those interviewed expressed the belief that reducing elevated cholesterol would have a "large" effect on heart disease; that percentage rose to 74 percent by 1990.

***Increasing knowledge about blood cholesterol levels.***

- **Sharp increase in knowledge of desirable cholesterol level:** The 1990 survey showed a fourfold increase over the 1986 survey in the public's knowledge that a desirable cholesterol level is below 200 mg/dL (65 percent in 1990 vs. 16 percent in 1986).
- **Rise in the number of individuals having their cholesterol checked:** The NCEP's "Know Your Number" message, in concert with other consumer, professional, and media efforts, has resulted in a significant rise in the number of people getting their cholesterol level checked. About two-thirds (65 percent) of the respondents in the 1990 public survey reported having had their blood cholesterol checked, up sharply from 46 percent in 1986 and almost double the number from the 1983 survey (35 percent).

***Growing recognition of the link between diet and heart disease and increasing nutritional knowledge.***

- **Widespread agreement that Americans should change their diet:** 86 percent of the respondents in the 1990 survey agreed strongly or somewhat that it would be a "good idea for Americans to eat less saturated fat and dietary cholesterol."[5]
- **Growing top-of-mind knowledge about the role of diet to prevent heart disease:** When asked if certain actions could prevent heart disease, 73 percent of respondents in 1990 thought that "eating fewer high-fat foods" would have a large effect, up from 72 percent in 1986 and 66 percent in 1983.
- **Increased recognition of specific dietary changes that can be made to control high blood cholesterol:** Between 1986 and 1990, the public appears to have become much more aware of dietary actions that can help to lower high blood cholesterol. When presented with a list of possible actions, the most frequently identified items were eating less fat (86 percent), eating less cholesterol (83 percent), and eating less sausage, bacon, and luncheon meats (81 percent). In addition, there was a significant increase in the number of respondents who mentioned eating less cheese from 50 percent in 1986 to 65 percent in 1990. There were also increases in those responding that using skim milk, eating fewer eggs, and partly replacing meat with fish and poultry would help control high blood cholesterol.

  In line with these data, the Food Marketing Institute's 1990 "Trends" survey showed that when asked on an unaided, open-ended basis about their attention to the nutrition contents of foods, the public responded with "fat" and "cholesterol" as the top two concerns, at 40 percent and 39 percent respectively. "Salt" was a distant third at 28 percent.[19]

***Continuing news media interest in the topic of cholesterol.***

In addition, consumers are continually reminded through advertising and some promotional messages about the need to lower one's cholesterol level.

***There is physician support for cholesterol lowering.***

- An even higher percent of physicians than the public stated that most Americans should change their pattern of eating. In 1990, 96 percent of physicians surveyed agreed that most Americans should eat less saturated fat and cholesterol (compared to 86 percent of the public).
- Physicians are treating their patients more intensively. For example, they are initiating diet and drug therapy at lower cholesterol levels; in 1990, these levels

# Nutrition Facts

Serving Size 1/2 cup (114g)
Servings Per Container 4

**Amount Per Serving**

**Calories** 260 Calories from Fat 120

| | % Daily Value* |
|---|---|
| **Total Fat** 13g | **20%** |
| Saturated Fat 5g | **25%** |
| **Cholesterol** 30mg | **10%** |
| **Sodium** 660mg | **28%** |
| **Total Carbohydrate** 31g | **11%** |
| Dietary Fiber 0g | **0%** |
| Sugars 5g | |
| **Protein** 5g | |

| | | |
|---|---|---|
| Vitamin A 4% | • | Vitamin C 2% |
| Calcium 15% | • | Iron 4% |

*Percent Daily Values are based on 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

| | Calories | 2,000 | 2,500 |
|---|---|---|---|
| Total Fat | Less than | 65g | 80g |
| Sat Fat | Less than | 20g | 25g |
| Cholesterol | Less than | 300mg | 300mg |
| Sodium | Less than | 2,400mg | 2,400mg |
| Total Carbohydrate | | 300g | 375g |
| Dietary Fiber | | 25g | 30g |

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

**An example of the new nutrition label developed by the Food and Drug Administration.**

approximated those recommended by the NCEP. However, approximately two-thirds of coronary heart disease patients are *not* being treated to lower their cholesterol level.[20]

- Physicians are aware of their own cholesterol levels and are changing their patterns of eating. Eighty-seven percent of the physicians surveyed in 1990 reported knowing their cholesterol level—up from 65 percent in 1986; and 69 percent said they had made dietary changes to lower cholesterol levels.

## The Public's Deficits

Although Americans have more knowledge to pursue changes in their diet to reduce blood cholesterol levels and their risk of heart disease, deficits still remain that must be overcome:

***Incomplete knowledge about personal risk for high blood cholesterol.***

- Thirty-five percent of the public report they have not had their blood cholesterol level checked.
- Only about one-third of the respondents in the 1990 survey (37 percent) remembered their own cholesterol level.
- It is estimated that about 29 percent of adults have blood cholesterol levels high enough to warrant medical advice and treatment—starting with diet therapy; and about 20 percent have levels 240 mg/dL or above. Yet in surveys, only 16 percent had been told by their physician that their cholesterol level was high. As noted previously, two-thirds of coronary heart disease patients are *not* being treated to lower their cholesterol level. Thus there is a significant number of people who have high blood cholesterol but are not yet aware of it.
- **Reasons for not getting one's cholesterol checked:** In the focus group discussions, participants' reasons for not getting their cholesterol checked included inconvenience, monetary cost,

and the lack of physical symptoms associated with high cholesterol. In addition, some participants said that they were not encouraged by their doctor to get their cholesterol level checked.

***Incomplete knowledge of key nutritional facts.***

- **Less than full knowledge of the sources of different kinds of fats in food:** With multiple choice questions, only 69 percent of the 1990 survey respondents correctly reported that saturated fat is found primarily in animal products and slightly fewer (61 percent) knew that polyunsaturated fats are found primarily in vegetable products.
- **Confusion about the difference between dietary cholesterol and fat:** In the 1990 survey, only about half the respondents (54 percent) correctly reported that dietary cholesterol and fats are different. Participants in focus groups showed the same confusion. Some stated, "fat and cholesterol are the same thing." Other focus group participants asked, "what if it has no cholesterol but it's fatty? Can you eat it?"
- In the 1990 survey, only 60 percent of the public knew that saturated fat raises one's cholesterol level.
- **Confusion about using food-labels:** The public may be confused about the implication of terms such as "no cholesterol," "low cholesterol," and "lite." In the 1990 CAS, only 50 percent of the respondents correctly stated that a food labeled "cholesterol free" could be either high or low in saturated fat. The new food labeling regulations should help clear up some of the confusion.

***Cholesterol is still not viewed as important a risk as smoking and high blood pressure.***

More of the 1990 public survey respondents said that quitting smoking (88 percent) or lowering high blood pressure (85 percent) would have a "large" effect on heart disease. As noted earlier, only 74 percent said that reducing high cholesterol would have a large effect.

***Difficulty in changing food preparation and eating habits.***

Focus group participants revealed why they like to eat high fat, high cholesterol foods: "I know you're supposed to cut out fried foods, but I love them. They taste good." "You have to cut out eggs, red meat, cheese, cream sauces...the foods I grew up on."

Some of the focus group participants also expressed concerns that children may be particularly resistant to foods lower in fat and cholesterol. They said it would be difficult to prepare different foods for different family members.

- **Prevalence of eating out, especially in fast food restaurants:** Annual surveys commissioned by the National Restaurant Association demonstrate that Americans continue to eat more of their meals away from home. This could influence their ability to plan a low fat meal. A survey, conducted by Gallup in 1991, showed that 52 percent of Americans ate at least one meal away from home each day. The rate of eating out was higher for men (57 percent) than for women (47 percent). When asked which meal they eat out most often, 30 percent responded lunch, 24 percent dinner, and 7 percent breakfast. Futhermore, 29 percent of respondents said they ate out at a "casual restaurant" at least once a week, including fast food restaurants, delis, pizza parlors, and family style restaurants.[21]

Other potential barriers to behavior change that emerged in focus group discussions included concern about lack of time to prepare "special" dishes, the perception that low-saturated fat, low cholesterol foods are expensive, and work or home schedules that result in use of quick convenience or "junk food" meals.

# 4. TARGET AUDIENCES

## Audience for the Population Strategy

As stated earlier, prevalence rates of high blood cholesterol and coronary heart disease warrant a broad-based educational effort aimed at the entire population over the age of 2. The population strategy, which encourages the public to adopt eating patterns lower in saturated fat and cholesterol to lower cholesterol levels in the population at large is appropriate for all ages except infancy, and all races, ethnic groups, socioeconomic levels, and geographic locales.

The burden of coronary heart disease is higher in certain groups even though cholesterol levels are not higher. Thus, along with NCEP, program planners may wish to select audience segments and to create messages with specific appeal to certain groups such as African Americans.

## Audience for the High-Risk Strategy

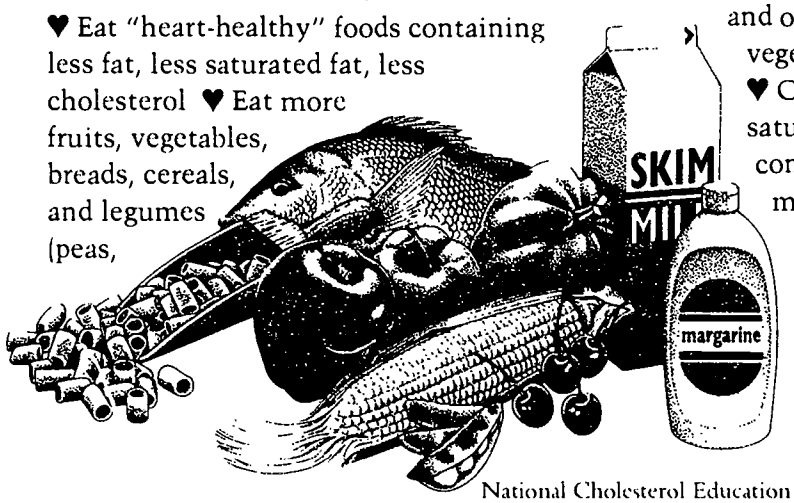
The aim of the high-risk strategy is to reach all Americans with the message to have their blood cholesterol checked in order to detect those in need of treatment for high blood cholesterol. The treatment population is defined on the basis of LDL-cholesterol levels whereas the recommended initial testing is aimed at total and HDL-cholesterol. Measurement of LDL-cholesterol is recommended for:

1. Those with a total blood cholesterol level of 240 mg/dL or above;
2. Those with a low HDL (less than 35 mg/dL);
3. Those with a "borderline-high" level (200-239 mg/dL) and two or more other coronary heart disease risk factors; and
4. All those with coronary heart disease.

# Don't eat your heart out.

**Eating right can reduce your blood cholesterol level and your risk of heart disease. Here are a few pointers:**

♥ Eat "heart-healthy" foods containing less fat, less saturated fat, less cholesterol ♥ Eat more fruits, vegetables, breads, cereals, and legumes (peas, beans, etc.) ♥ Eat more low-fat dairy foods ♥ Eat moderate amounts of trimmed, lean red meat; skinless poultry; and fish ♥ Limit how many egg yolks you eat ♥ Use unsaturated oils, margarines and shortenings ♥ Choose breads and other baked goods made with unsaturated vegetable oils, and little or no egg yolk ♥ Choose "convenience" foods by how much saturated fat, total fat and cholesterol they contain–not just cost ♥ Cut down how much fat you cook with




**IT'S YOUR HEART.**
**IT'S YOUR LIFE.**
**IT'S YOUR MOVE.**

National Cholesterol Education Program
National Heart, Lung, and Blood Institute; National Institutes of Health; Public Health Service; U.S. Department of Health and Human Services

A sample of a print PSA with a population approach.

The high-risk group who need dietary therapy (about 29 percent of the U.S. population) is defined as:

1. Those with coronary heart disease and an LDL >100 mg/dL;
2. Those without coronary heart disease who have LDL levels 130-159 mg/dL with two or more other coronary heart disease risk factors; and
3. Those without coronary heart disease who have LDL levels ≥160 mg/dL.

Ideally, each of these people would be following a physician-recommended treatment regimen based on the ATP guidelines.

# 5.

# COMMUNICATIONS OBJECTIVES AND STRATEGIES

Communications objectives for the NCEP's public education effort fall into two categories: those for the general population audience and those for the high-risk audience. Ideally, however, the two approaches will reinforce one another. As actual communications programs are planned, each strategy and specific activity of a program should contribute to one or more of these overall objectives.

## Communications Objectives for the Population Approach

The objective of the population approach of the NCEP is to motivate individuals to take action that will result in heart-healthy eating, including the following:

**Awareness:** Increase and reinforce public awareness that lowering blood cholesterol will help prevent heart disease.

**Knowledge:** Increase and reinforce public knowledge that an eating pattern high in saturated fat and cholesterol raises the blood cholesterol level. Increase knowledge about specific low fat, low-saturated fat, and low cholesterol patterns of eating.

**Action:** Increase the number of Americans adopting "heart-healthy" eating patterns lower in saturated fat and cholesterol.

As research has shown, the risk of heart disease is not limited to those with high blood cholesterol. People with levels below 240 mg/dL are also at risk. It therefore is recommended that Americans lower their cholesterol and keep it low. With the average blood cholesterol level at 205 mg/dL, a significant portion of the American population is at a higher than desirable level. "Heart-healthy" eating may reduce the likelihood that these people will develop other risk factors for heart disease, such as obesity. This low fat, low cholesterol pattern of eating also plays a role in preventing other chronic diseases such as cancer.


This poster is typical of materials developed for NCEP's population approach.

## Communications Strategies for the Population Approach

Communications strategies provide the general direction for the development of messages; they are not intended as specific message suggestions. Their purpose is to ensure that clear, consistent, and meaningful messages are disseminated to the appropriate audiences. Strategies evolve from the analysis of audience knowledge, attitudes, and practices. The following strategies will guide program development of the population approach:

### *Reinforce the link between high blood cholesterol and heart disease.*

To convince individuals of the importance of cholesterol, messages should emphasize its direct relationship to heart disease.

### *Reinforce the link between a diet high in saturated fat and cholesterol, and high blood cholesterol.*

Messages should educate the audience that it is primarily saturated fat and cholesterol in the diet that contribute to elevated blood cholesterol levels.

Reinforce the principle that an eating pattern low in saturated fat and cholesterol will lower the blood cholesterol level, and thus lower the chances of heart disease.

### *Communicate the other benefits of having your cholesterol level checked, knowing your number, and understanding what it means.*

Focus groups revealed that a key motivation for having one's cholesterol checked and knowing the number is "peace of mind," "feeling better," and "knowing where I stand."

A message that communicates these benefits has the potential to influence those who deny the possibility of heart disease.

***Communicate that getting one's cholesterol level checked is relatively simple and painless and can be done the next time a person sees the doctor.***

Focus group participants indicated that a barrier to getting one's level checked is inconvenience. Since such checks are often part of routine blood work during a physical, the message could be "ask your doctor."

***Communicate the principles of a heart-healthy eating pattern low in saturated fat and cholesterol.***

As much as possible within the communications channels available, messages should provide guidance on how to adopt a blood cholesterol-lowering eating pattern (e.g., which foods to cut down on, which foods to eat more of, and what are the best ways to shop for and prepare foods).

***Demonstrate specific food selection and preparation skills needed for heart-healthy eating patterns.***

Although the public is still confused about key nutritional facts related to fats and cholesterol, it may be difficult to teach these distinctions in a mass media campaign. However, given the increasing awareness of specific foods low in saturated fat and cholesterol, messages should go beyond generalities and encourage the public to take appropriate action (e.g., choose soft margarine instead of butter, choose fish and lean meats, remove skin from poultry, select skim milk products over whole milk products, and eat more fruits, vegetables, cereals, and grain products).

Even if they wanted to change their eating pattern to lower their blood cholesterol level, a substantial fraction of the public believes they lack the skills to do so. The mass media, when using longer message formats such as print ads, TV and radio programming, and direct mail, are well suited to demonstrating basic skills (e.g., broiling or baking instead of frying) and overcoming personal preference barriers (e.g., by making lower-fat foods look appealing and by showing family acceptance of these foods).

***Communicate the concept that everyone needs to eat a heart-healthy diet to control their blood cholesterol level.***

As recommended by the population and children's panel reports, messages should let the public know that most Americans should follow a heart-healthy way of eating.

***Communicate the benefits of eating a heart-healthy diet.***

The Cholesterol Awareness Survey indicated that two-thirds of the general public "agrees strongly" or "agrees somewhat" that Americans should eat less saturated fat and cholesterol. However, to appeal to those in the population who do not see themselves at risk for heart disease, it may be necessary to emphasize the "here and now" reasons for heart-healthy eating—being in control, feeling better, doing something good for one's family and one's self, etc.

***Communicate the concept that a combination of good eating habits, physical activity, and weight loss, if necessary, is important in controlling blood cholesterol.***

The benefits of exercise and weight loss in combination with heart-healthy eating should be incorporated into messages whenever possible. Messages should explain that regular exercise and weight loss in the overweight can increase the effectiveness of dietary changes in lowering blood cholesterol and reducing a person's risk of coronary heart disease. Exercise and weight loss also boost the level of HDL cholesterol.

## Communications Objectives for the High-Risk Approach

- To identify the high-risk population, the NCEP seeks to increase the number of people who:

  —have had their cholesterol level checked,

  —know their number,

  —understand what it means, and

  —take steps to lower it if it is high.

About 29 percent of the current adult population is estimated to have an elevated blood cholesterol requiring medical advice and treatment, with diet as the primary treatment. Yet of all those surveyed in 1990, only 16 percent said they had been told by their physician that their cholesterol level was high. Moreover, only one third of coronary heart disease patients are receiving cholesterol-lowering treatment. Therefore, it is necessary to continue with a detection strategy to identify high-risk individuals. A detection strategy also helps "catch" those who may develop high blood cholesterol as they age, or those who have not been exposed to these messages in the past.

- Increase the number of high-risk individuals who are controlling their high blood cholesterol, primarily by increasing the number of individuals who are following prescribed cholesterol-lowering diets, engaging in physical activity, and losing weight—if overweight.

Only 9 percent of those surveyed said they were on a cholesterol-lowering diet recommended by a physician. Obviously, to meet this objective, the public education and professional education efforts must be closely coordinated. However, the mass media campaign can help reinforce diet-related information given by physicians or dietitians and can provide social support for maintenance of diet therapy. The messages put forth in the population approach will help to support this objective.

## Communications Strategies for the High-Risk Approach

Message strategies for the high-risk approach will include all of the strategies mentioned for the population approach, with particular emphasis on detection of high blood cholesterol and the third and fourth strategies (Communicate the other benefits of having your cholesterol level checked, knowing your number, and understanding what it means. Communicate that getting one's cholesterol level checked is relatively simple and painless and can be done the next time a person sees the doctor.). The following additional strategies for the high-risk approach will also be included in NCEP messages:

### *Reinforce awareness of key cholesterol numbers and what they mean.*

The public is becoming increasingly knowledgeable about what constitutes a "desirable" cholesterol level. However, about half of those who report having had their cholesterol checked do not remember their number. One way of helping people remember "where they stand" is to reinforce the key benchmark levels as outlined by the Adult Treatment Panel. It may not be as important to remember a specific number as to remember where one fits in that overall scheme.

### *Emphasize that high blood cholesterol levels can be controlled and that adopting heart-healthy eating habits is an effective means of control.*

Diet therapy is the primary means of addressing high blood cholesterol, but changing long-term eating habits may not be easy for many

## "Not at Random"

***(Men)***

**SFX:** Music and distorted sirens

**Man:** Heart disease will kill 500,000 people this year.

They won't be selected at random.

Do you know your cholesterol number?

It's one of the most important things to learn about your risk of heart disease.

A message from the National Cholesterol Education Program.

***(Women)***

**SFX:** Music and distorted sirens

**Woman:** Heart disease will kill 245,000 women this year.

They won't be selected at random.

Do you know your cholesterol number?

It's one of the most important things to learn about your risk of heart disease.

A message from the National Cholesterol Education Program.

Two versions of a radio PSA (one targeted specifically to women) illustrate the NCEP's high-risk approach.

people. This strategy seeks to give high-risk patients an increased sense of "empowerment" —that they can do something about their condition and that they will see results.

In addition, the NCEP's professional and patient education effort will focus in part on providing information to develop more complex skills, such as reading food labels.

***Communicate the importance of controlling blood cholesterol for people with coronary heart disease.***

Morbidity and Mortality in Secondary Prevention Trials*

| Event | Reduction in Risk |
|---|---|
| Nonfatal myocardial infarction | 26% |
| Fatal myocardial infarction | 14% |
| All deaths | 9% |

**Meta-analysis by Rossouw from ATP II.*[6]

This meta-analysis of studies of patients with established CHD showed that cholesterol-lowering therapy reduced recurrent CHD events by about 26 percent and total deaths by about 9 percent.

# 6. DESIRED ACTIONS

The overall goal of the NCEP's public education efforts is to motivate action from the public, not simply to create awareness or increase knowledge. All components of communications programs should be designed to create a cumulative effect that will elicit at least one of the following desired actions:

***For the population approach:***

- ▶ Eat a diet lower in saturated fat, total fat, and cholesterol.
- ▶ Help and support others in eating a heart-healthy diet.

***For the high-risk approach:***

- ▶ Get cholesterol level checked.
- ▶ Ask for results of the test.
- ▶ If the cholesterol number is elevated, talk to the doctor about how to lower it.
- ▶ Understand what the number means.
- ▶ Take action to lower high blood cholesterol.

# 7.

# CONCLUSIONS

This document is provided to assist health professionals and educators in planning programs and tactics that will effectively communicate messages about lowering blood cholesterol levels, especially through the mass media.

It is acknowledged that over the next several years, rapid changes in the larger environment are likely to influence the public's attitudes and behaviors about cholesterol. For example, the Food and Drug Administration has established new food labeling regulations. In addition, the consumer news media will undoubtedly follow the cholesterol issue closely.

Other anticipated changes in the environment include the involvement of more restaurants in the provision of heart-healthy menu selections. This should help to reduce the fat intake of most segments of the population, including children. Furthermore, as manufacturers provide more low-fat, low cholesterol foods, children in particular should be more willing and likely to eat heart-healthy foods.

Additionally, it is expected that as the public becomes more knowledgeable, commercial, government, and health organizations will modify educational materials to include more complex levels of information.

In this larger context, it is increasingly important that NCEP and other program planners disseminate messages that are not only consistent and factually correct, but also informative, comprehensible, interesting, and meaningful to the audiences being addressed.

# ENDNOTES


1. Comments and suggestions about the statement are welcomed. We are particularly interested in applications of this statement to local messages and materials. Please send comments and examples of materials to: Ms. Terry Long, Communications and Public Information Branch, National Heart, Lung, and Blood Institute, 31 Center Drive, MSC 2480, Bethesda, Maryland 20892-2480.

2. NCEP Expert Panel. NCEP report of the expert panel on detection, evaluation, and treatment of high blood cholesterol in adults. *Arch of Intern Med* 1988;258:36-69.

3. NCEP Expert Panel. NCEP report of the expert panel on population strategies for blood cholesterol reduction. *Circulation* 1991;83:2154-232.

4. NCEP Expert Panel on Blood Cholesterol Levels in Children and Adolescents. NCEP report of the expert panel on blood cholesterol levels in children and adolescents. *Pediatrics* 1992;89(Suppl 3, part 2):495-501.

5. In conjunction with the Food and Drug Administration, NHLBI sponsored Cholesterol Awareness Surveys, national telephone surveys of practicing physicians and the adult public in 1983, 1986, and 1990. These surveys assessed attitudes and practices regarding high blood cholesterol. Approximately 1,600 physicians and 4,000 adults were interviewed. The surveys are national probability samples and can be extended to the population as a whole. Schucker B, Wittes JT, Santanello NC, *et al.* Change in cholesterol awareness and action: results from national physician and public surveys. *Arch Intern Med* 1991;151:666-73. Schucker B, Bailey K, Heimback J, *et al.* Change in public perspective on cholesterol and heart disease: results from two national surveys. *JAMA* 1987;258:3527-31.

6. NCEP Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Summary of the second report of the National Cholesterol Education Program expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel II). *JAMA* 1993;269:3015-23.

7. Johnson CL, Rifkind BM, Sempos CT, *et al.* Declining serum total cholesterol levels among U.S. adults. *JAMA* 1993;269:3009-14.

8. National Heart Attack Alert Program Coordinating Committee, 60 Minutes to Treatment Working Group. Emergency Department: Rapid Identification and Treatment of Patients with Acute Myocardial Infarction. *Annals of Emergency Medicine* 1994;23:311-329.

9. Monthly Vital Statistics Report, National Center for Health Statistics, Vol. 42, No. 2, Supplement. August 31, 1993.

10. Unpublished data, National Health Interview Survey (1989) and National Hospital Discharge Survey (1989); National Center for Health Statistics.

11. See Lipid Research Clinics Program. The Lipid Research Clinics Coronary Primary Prevention Trial results I (CPPT): reduction in incidence of coronary heart disease. *JAMA* 1984;251:351-64; and Lipid Research Clinics Program. The Lipid Research Clinics Coronary Primary Prevention Trial results II: the relationship of reduction in incidence of coronary heart disease to cholesterol lowering. *JAMA* 1984;251:365-74.

12. Blankenhorn DH, Nessim SA, Johnson RL, *et al.* Beneficial effects of combined Colestipol-Niacin therapy on coronary atherosclerosis and coronary venous bypass grafts. *JAMA* 1987;257:3233-40.

13. Buchwald H, Varco RL, Matts JP, *et al.* Effect of partial ileal bypass surgery on mortality and morbidity from coronary heart disease in patients with hypercholesterolemia. *N Engl J Med* 1990;323:946-55.

14. In the Familial Atherosclerosis Treatment Study (FATS) 146 men, 62 years or younger and with a family history of coronary heart disease, were randomly assigned to one of three therapeutic strategies. The study showed that intensive therapy to modify lipid levels had significant effects on the frequency of cardiovascular events as well as regression and progression of atherosclerosis. Brown G, Alberts JJ, Fisher LD, *et al.* Regression of coronary artery disease as a result of intensive lipid-lowering therapy in men with high levels of apolipoprotein B. *N Engl J Med* 1990;323:3233-40.

15. Kane JP, Malloy MJ, Ports TA, *et al.* Regression of coronary atherosclerosis during treatment of familial hypercholesterolemia with combined drug regimens. *JAMA* 1990;264:3007-12.

16. NHLBI and the American Heart Association issued a joint statement reviewing the research on diet, high blood cholesterol and heart disease. See "The Cholesterol Facts: A Summary of the Evidence Relating Dietary Fats, Blood Cholesterol, and Coronary Artery Disease: A Joint Statement of the American Heart Association and the National Heart, Lung, and Blood Institute, November 14, 1989." A more detailed review of these studies is in *Diet and Health. Implications for Reducing Chronic Disease Risk*, National Research Council, Committee on Diet and Health, Washington, DC, National Academy Press, 1989.

17. Sempos C, Cleeman J, Carroll M, *et al.* Prevalence of high blood cholesterol levels among U.S. adults. *JAMA* 1993;269:3009-14.

18. Goldman L, Gordon D, Rifkind B, *et al.* Cost and health implications of cholesterol lowering. *Circulation* 1992;85:1960-68.

19. A 1990 survey conducted by the Food Marketing Institute also showed rapidly rising public concern about the amount of fat in foods. In 1990, 40 percent of the public said the fat content of food was the nutritional item that "concerned them most," with cholesterol running second at 39 percent. In 1989, the figures were 29 percent for fat content and 38 percent for cholesterol content. See "Trends: Consumer Attitudes and the Supermarket," 1990, Food Marketing Institute, Washington, D.C.

20. Cohen MV, Byrne M-J, Levine B, Gutowski T, Adelson R. Low rate of treatment of hypercholesterolemia by cardiologists in patients with suspected and proven coronary artery disease. *Circulation* 1991;83:1294-1304.

21. The March 1991 National Restaurant Association Survey, conducted by Gallup, also shows that the majority of Americans (57 percent) who eat out at least once a day are more likely to eat at a less expensive restaurant such as a deli or a fast-food establishment. See "Annual Survey, 1991," National Restaurant Association, Washington, DC.

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