



# Adventist Health Study 2

better health for everyone!

# Report 2007

VOLUME IV

## Progress and Opportunities

**F**ive years have passed since we first started recruiting members to join the Adventist Health Study. You can see from the timeline “15 Year Study Schedule” that we are now finishing Phase 1 and moving into Phase 2 of the study.

In the near future we expect further funding, from the National Cancer Institute, to continue the study for the next five years. The ground work has been laid, the follow-up continues and during the next seven years we expect to make significant health discoveries. You will see some preliminary findings in this issue. Thank you for your part in this important study.

### What has been accomplished?

- ▶ 95,000 members from more than 4,000 U.S and Canadian churches completed the Lifestyle Questionnaire. 1,000 of these members also completed an extensive validation of diet and physical activity
- ▶ Mobile clinic teams conducted 176 church clinics across North America
- ▶ Hospital History Forms 1 and 2 were mailed and returned
- ▶ 130,000 questionnaires were checked and scanned into the computer
- ▶ The nutrition team have coded more than 100,000 different foods and recipes
- ▶ The Adventist Religion & Health Study (ARHS) commenced
- ▶ Much positive media publicity about the Adventist

Health Study has brought blessings to the church worldwide

- ▶ Ten scientific papers on study methods have been published

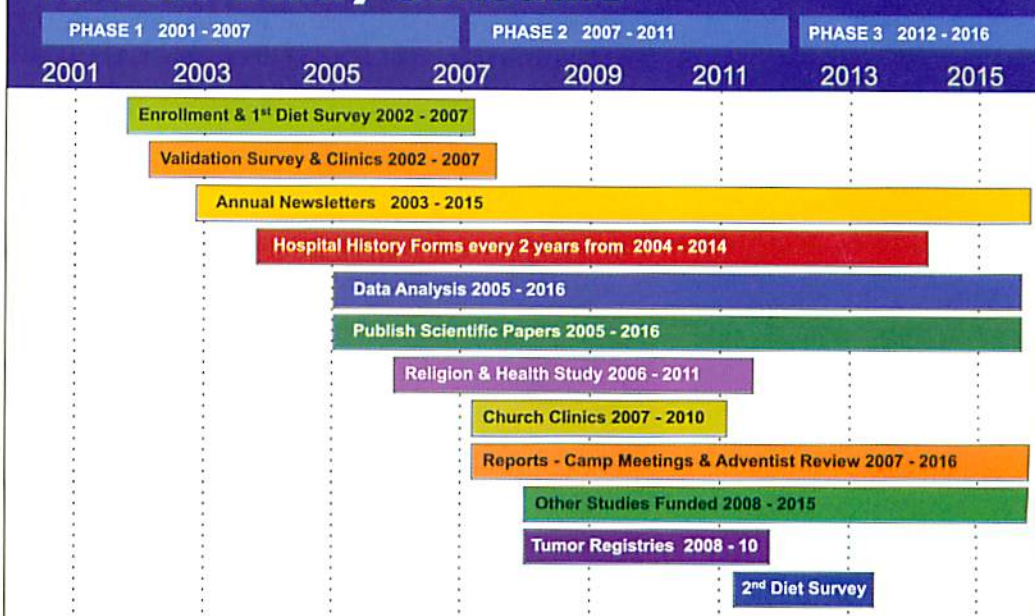
### What you can expect in the future.

- ▶ The short Hospital History Form will be mailed every two years and a second dietary questionnaire in 2011
- ▶ Clinics conducted in 2000 churches to collect blood samples
- ▶ Continuing data analysis and publishing of scientific papers
- ▶ More TV and other news media coverage
- ▶ Results shared via newsletters, articles in church magazines and at camp meetings
- ▶ Linkage with 50 Tumor Registries in the U.S. and Canada to identify cancers
- ▶ Other studies, which build on AHS-2, such as heart disease, diabetes, and aging

### Inside This Issue

- 3 1 in 10 Members Enroll
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- 6 Good Start to Religion Study

## 15 Year Study Schedule



## A Brief Look at Cancer

**S**adly, cancer affects all of us. Nearly all persons in the study will either themselves have experienced cancer or have a family member or very close friend who has. After heart disease, cancer is the second leading cause of death in the United States and Canada.

While more often a disease of older age, various cancers are also a major cause of premature death in the young and middle-aged groups. One in every four persons will die of a cancer and the American Cancer Society (ACS) estimates that the lifetime risk of developing cancer is 1 in 2 for males and 1 in 3 for females.

During the last 35 years, many organizations, including the United States and Canadian National Cancer Institutes and Cancer Societies, have directed billions of dollars to the "war on cancer". Progress in the detection, treatment and prevention of cancer has often been slow. But recent reports from ACS indicate that the rates of new cases and deaths of cancer are gradually decreasing year by year. Earlier detection and new and improved treatment options are increasing the length of survival after diagnosis.

Since 1960, the Adventist Health Studies have contributed much to prevention efforts through discoveries showing the role of smoking, diet and lifestyle behaviors in causing or preventing cancers. The causes of many cancers are now well understood but for other cancers including the major cancers of the breast, prostate and colon it is much less clear. Because of our funding source and the potential findings we can make, our main efforts at this stage of AHS-2 are directed toward these three cancers.

## A Focus on Black Health Issues

**A**n important objective of AHS-2 is to research factors relating to health disparities among people of African descent. About 13% of the U.S. population identify themselves as Black or African American.

To help address the national health disparity issues, a special effort has been made to enroll as many Black Adventists as possible into AHS-2. The Black recruitment team led by Dr Patti Herring, has achieved a good response with 25,000 Black participants completing the questionnaire. This represents about one in four of all eligible Blacks in Adventist churches. The sharing and dissemination of AHS-2 research findings to this group is particularly important. Each year, the Black research team produces a special Black edition of the newsletter called "Legacy for Life". Check our website for electronic copies of these newsletters.



Research Assistants, Yolanda and Sonya, check the Black AHS-2 newsletter

substantially higher for Black females than for White females. Among Black males, the incidence of prostate, lung, colon and stomach cancers was higher than for White males.

The participation of Black Adventists in AHS-2 will undoubtedly make a major contribution to understanding the lifestyle and dietary factors that can help reduce this burden of disease.

<sup>1</sup> MMWR, January 14, 2005 / 54(01): 1-3



A 2005 report from the Centers for Disease Control states that "for many health conditions, non-Hispanic Blacks bear a disproportionate burden of disease, injury, death, and disability." For many of the leading causes of death "the risk factors and incidence, morbidity, and mortality rates for these diseases ... often are greater among Blacks than Whites."<sup>1</sup>

National Center for Health Statistics data show that life expectancy at birth, in 2004, was five years less for Blacks (73.3 years) than for Whites (78.3 years). Blacks have higher death rates from diabetes, cardiovascular disease and most cancers than Whites. Age-adjusted incidence of colon, pancreatic and stomach cancers was



**"Have computer: Will run."**  
Our computing and technical research staff - Lars, Sandy, Ru and Gabe play a vital role in the programming, collection, management and analysis of data for all phases of the study.



- Atlantic**  
6,847 Participants  
1 in 13 members  
27 % churches reach goal
- Canada**  
3,787 Participants  
1 in 14 members  
24 % churches reach goal
- Columbia**  
10,350 Participants  
1 in 10 members  
21 % churches reach goal
- Lake**  
8,081 Participants  
1 in 9 members  
21 % churches reach goal
- Mid-America**  
7,560 Participants  
1 in 8 members  
37 % churches reach goal
- North Pacific**  
13,397 Participants  
1 in 6 members  
36 % churches reach goal
- Pacific**  
19,603 Participants  
1 in 10 members  
24 % churches reach goal
- Southern**  
18,572 Participants  
1 in 11 members  
21 % churches reach goal
- Southwestern**  
6,417 Participants  
1 in 12 members  
24 % churches reach goal

## One in Ten Members Enroll

The map is a picture of participation. We compare AHS-2 enrollment rates by Union Conference regions across the North American Division. On average, one out of every ten members has completed the questionnaire to enroll. North Pacific with a ratio of 1 participant to every 6 members and Mid-America 1 to 8 had the highest levels of participation. By comparison, one in four Adventist Californians participated in the 1976 study.

### Regional Comparisons of Diet

There are minor differences in some of the key diet factors—people who drink soy milk once or more a week and people who are vegetarian. Canada, at 69%, has the highest percentage of members consuming soy milk. North Pacific, at 48%, has the highest proportion of vegetarians.

Region	% Who Drink Soy Milk	% Vegan or Lacto-Ovo Vegetarian
Atlantic	61%	31%
Canada	69%	40%
Columbia	52%	35%
Lake	54%	41%
Mid-America	51%	38%
North Pacific	56%	48%
Pacific	54%	41%
Southern	52%	36%
Southwestern	52%	36%

### 1,107 Churches Achieve Gold

We challenged Conferences and Churches to join the Olympic spirit and achieve the highest medal status for returned questionnaires. Goals were based on 18-24% of the listed membership. We say a special thank you to the 1,107 churches that have reached 90% or more of their goal. You can check your church medal status at our website [www.adventisthealthstudy.org](http://www.adventisthealthstudy.org)

#### Returned Questionnaire Goal Achievement

Medal Status	% of Goal	Number of Churches
Double Gold	105% & higher	713
Gold	90-104%	394
Silver	75-89%	456
Bronze	60-74%	507

# How Does Your Diet Affect Your Health?



We present some early study results looking at the association of diet with reported conditions of weight, high cholesterol level, high blood pressure and type 2 diabetes.

**F**irstly, we classified each participant into one of five broad diet groups based on their combined responses to more than 25 food questions about the consumption of red meat, fish, poultry, dairy and eggs. The five diet classifications and percentage of participants in each are shown in the table below. ("None" for a food group means never consumed or consumed less than once a month)

**S**econdly, for each of these diets, we compared the health conditions self-reported by participants when they

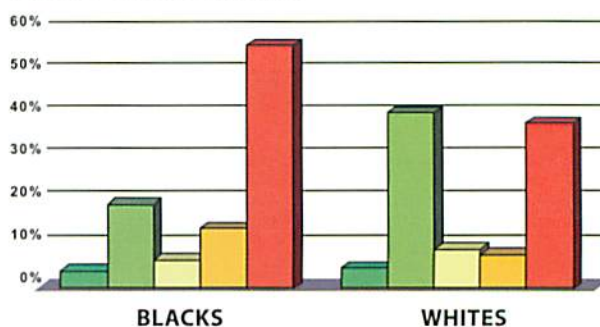
filled in the questionnaire. This is a simple preliminary analysis and only uses data given by the participants for conditions diagnosed in the past and being treated at the beginning of the study. We shall have more definitive data as we conduct follow-up of the group over time. Results for cancer are another four or five years away.

For high cholesterol, Blacks had lower levels than Whites; but for hypertension and diabetes, Blacks had a higher prevalence than Whites.

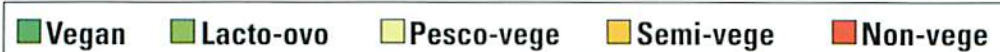
## Classification of Dietary Status

	%	BEEF	POULTRY/FISH	DAIRY/EGGS
<b>VEGAN</b>	4.3	NONE	NONE	NONE
<b>LACTO-OVO</b>	34.0	NONE	NONE	
<b>PESCO-VEGE</b>	9.7	NONE		
<b>SEMI-VEGE</b>	8.3			
<b>NON-VEGE</b>	43.7			

## Dietary Status by Race



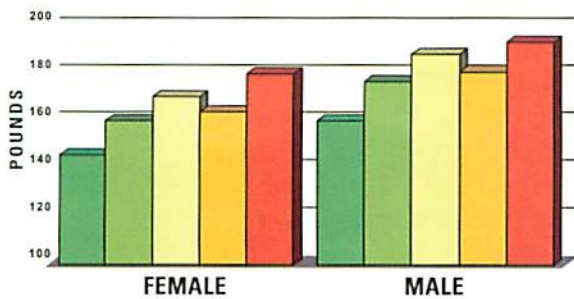
- Note: 1. Vegans (total vegetarians): No red meat, fish, poultry, dairy and eggs  
 2. Lacto-ovo vegetarians: Eat milk and/or eggs but no red meat, fish or poultry  
 3. Pesco-vegetarians: Eat fish, milk and eggs but no red meat and poultry  
 4. Semi-vegetarians: Eat red meat, poultry and fish less than once per week  
 5. Non-vegetarians: Eat red meat, poultry, fish, milk and eggs more than once a week



## Weight

We compared the average weights across diet groups. There was a general increasing trend in weight from vegans to non-vegetarians for both females and males. For a typical 55-year old woman 5'6" tall, vegan women reported weights 34 pound less than non-vegetarian women the same age and height. And for a typical 55-year old man 5'10" tall, vegan men reported weights 32 pounds less than non-vegetarian men the same age and height. For both men and women semi-vegetarians weighed 7 pound less than fish eating vegetarians.

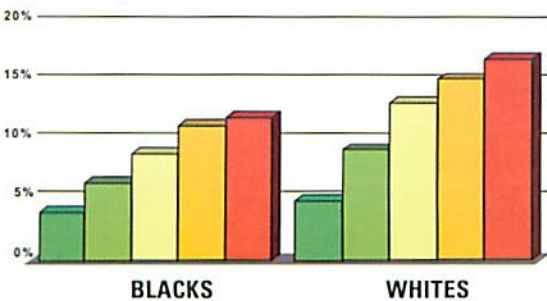
### Weight Differences Between Vegetarians and Non-Vegetarians



## High Cholesterol

Overall and for each diet category, a lower proportion of Blacks reported being treated for high cholesterol levels compared to Whites. Once again there was an increasing trend across the diet categories. For Blacks and Whites respectively vegans (4.3% and 5.2%), followed by lacto-ovo vegetarians (6.7% and 9.5%) were diagnosed for high cholesterol, this less than non-vegetarians (12.3% and 17.3%).

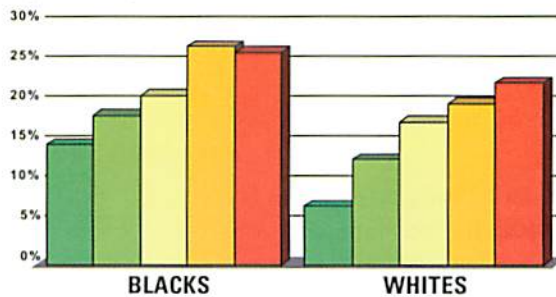
### Frequency of High Cholesterol by Dietary Status and Race



## High Blood Pressure

High blood pressure was reported less by Whites than Blacks. In this report, among Blacks, 15.2% of vegans, 18.8% of lacto-ovo vegetarians and 26.8% of non-vegetarians reported having high blood pressure. Among Whites the trend was similar; 7.4% of vegans, 13.3% of lacto-ovo vegetarians and 22.9% of non-vegetarians reported having high blood pressure.

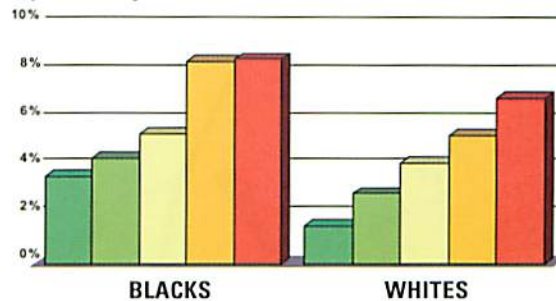
### Frequency of High Blood Pressure by Dietary Status and Race



## Diabetes

Overall more than three times as many non-vegetarians than vegans reported being treated for type 2 diabetes. Blacks have a higher level of diabetes than Whites. However, for both Blacks and Whites the prevalence of diabetes increases as the diet increases in animal products. Lacto-ovo vegetarians have about half the prevalence of diabetes compared to non-vegetarians (Blacks 4.4% to 8.7% and Whites 3% to 7%).

### Frequency of Type 2 Diabetes by Dietary Status and Race



■ Vegan   
 ■ Lacto-ovo   
 ■ Pesco-vege   
 ■ Semi-vege   
 ■ Non-vege

## And the Best Diet for Health Is...?

Many Adventist vegetarians are interested in knowing which is the best diet - vegan or lacto-ovo? We don't have all the information in yet BUT AHS-2 is already easily the best study in the world to address this question.

You can see from the charts that vegans do better as far as body weight, frequency of diabetes, hypertension and high cholesterol, but lacto-ovo vegetarians also do much better than non-vegetarians.

What we do not know, which is even more important, is whether vegans do better than lacto-ovo vegetarians in the risk of heart disease and cancer. Information from previous studies was very tentative (as these studies were much smaller) but they suggested that vegans have about the same risk of heart disease but just maybe experience more cancer. SO we'll have to wait for AHS-2 to give more definitive answers. In the meantime it is clear that a lacto-ovo vegetarian diet is a healthful and sensible choice to make.

# What Happens to Your Questionnaires?

**D**o you wonder what happens to your returned questionnaires at the AHS-2 office? We've used several questionnaires so far to gather different types of data. Here's a brief description of the procedures used in our AHS-2 office to collect, protect, store, manage and prepare the large amount of data for analysis.



- 1 AHS-2 Lifestyle Questionnaire:** The big questionnaire completed at the time of enrollment: questions on foods, physical activity, and medical history.
- 2 Hospital History Form (Bi-Annual Hospitalization History):** The 4-page form sent every two years asking about any hospital admissions and diagnosis of cancer and heart attacks.
- 3 Adventist Religion & Health Study (ARHS) Questionnaire:** A 20-page questionnaire completed by a random sample of 10,000 participants: questions on religious beliefs, Sabbath, stress and health.



Gina processing the mail



Chris helps process the questionnaires

## step 1

### The Mail Room

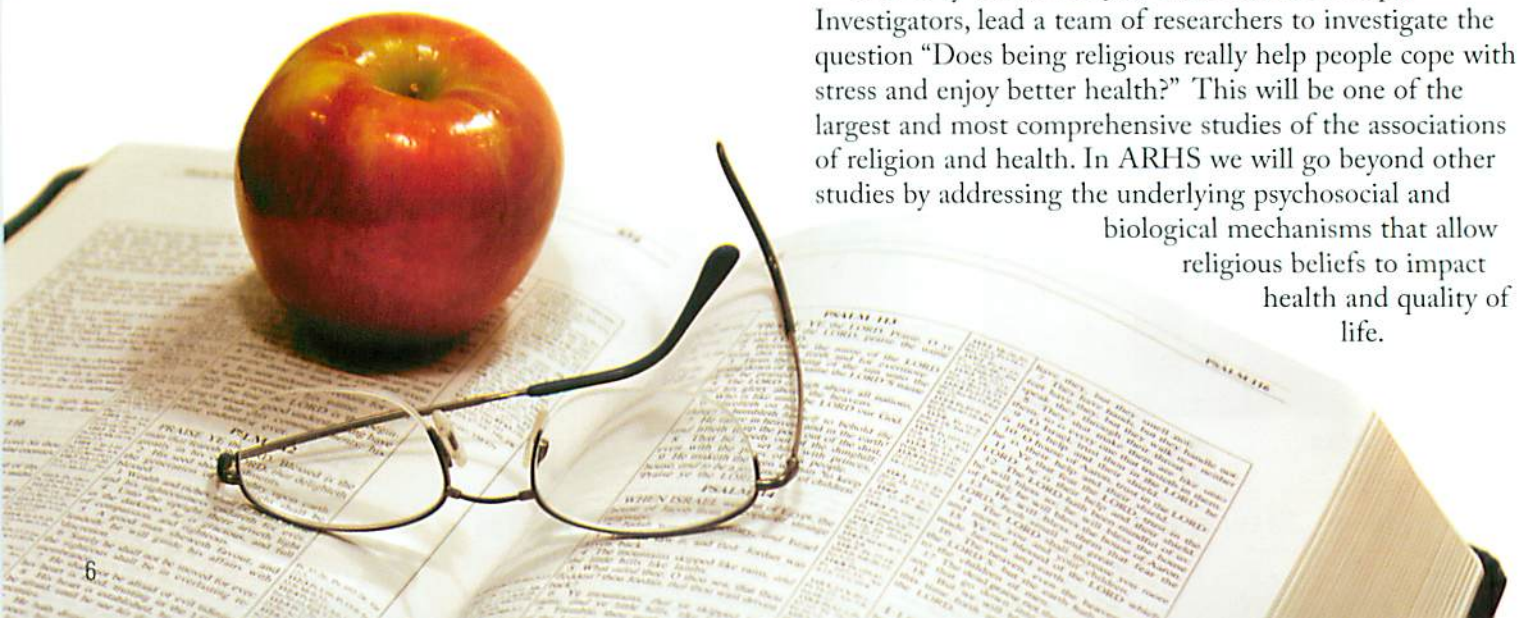
Every day we receive tubs of mail from US Post, sometimes with thousands of pieces of mail. Envelopes are opened and questionnaires are sorted for processing. The barcode on each questionnaire is scanned to record the receipt date. The mail room team also assemble and send out supplies to churches, make address corrections and re-mail post office returns of undeliverable mail.

## step 2

### Confidentiality of Data

The back page, of the large Lifestyle Questionnaire, with the personal contact information is first removed and filed separately from the rest of the questionnaire. An important part of this process is to protect the privacy and confidentiality of your personal information. Your name is never linked to your questionnaire responses in any computer file

## Good Start to Religion Study



**T**he Adventist Religion and Health Study (ARHS), a sub-study of AHS-2, is off to a good start.

Funded by the National Institutes of Aging with a grant of \$1.25 million over five years, ARHS is a collaborative project of the Schools of Public Health, Religion, Medicine and Psychology at Loma Linda University.

Drs Gary Fraser and Jim Walters, the Principal Investigators, lead a team of researchers to investigate the question "Does being religious really help people cope with stress and enjoy better health?" This will be one of the largest and most comprehensive studies of the associations of religion and health. In ARHS we will go beyond other studies by addressing the underlying psychosocial and biological mechanisms that allow religious beliefs to impact health and quality of life.



Leon and Gladys, two of our volunteer helpers

### step 3

#### Pre-scan Check

We have a team of volunteers who manually check each questionnaire, before scanning takes place, to make sure that the key questions are answered, that no pages are left blank and that the scan bubbles are correctly filled in.



Amber conducts a 24-hour dietary interview

### step 4

#### Phone Calls for Extra Information

Some participants are contacted by phone to collect critical missing information or to clarify responses. For various sub-studies we may call and invite people to participate or to conduct telephone interviews.



Ray manages the scanning process

### step 5

#### Scanning

Our large scanner can process about 140 questionnaires an hour. The scanner optically reads the marked bubbles, takes a tiff image of each page and then digitally stores the data on our computer. Ray then performs a post-edit check and manually enters any write-in data. More than 5 million pages of data have been scanned and stored ready for analysis.



Dr. Larry Beeson checks on the filing

### step 6

#### Step 6: Filing

After scanning, the questionnaires are filed in locked storage cabinets in a locked room for security. Occasionally there may be need to check these questionnaires but all our analysis is conducted on the data files stored on our secure computers.

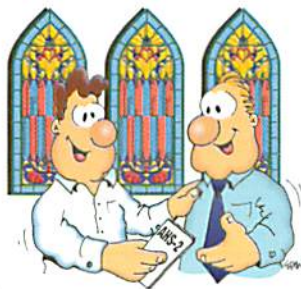
There are two parts to the study. In the first, 10,000 randomly selected participants from the AHS-2 parent study are invited to complete a questionnaire that has a focus on faith, religious activities, and beliefs about God, Sabbath, social support and stress.

Already, nearly 6,000 questionnaires have been returned. The other 4,000 should be completed by April.

The second part of the study adds a clinical component. Five hundred participants (250 Black and 250 non-Black) over the age of fifty years and living near Loma Linda are invited to a check-up that includes a memory test, a balance and agility check and a blood test to check for measures of stress.

The clinics started in February and the data gathered will allow investigators to identify associations between religion and biological measures of stress, immune system function, and physical/cognitive function.

A major benefit of the ARHS sub-study is the ability to combine the extra data with the extensive lifestyle



and health information already collected in AHS-2. This unique, diverse and large geographically spread study will increase our understanding of how biological, psychosocial, emotional, lifestyle and religious factors influence each other and impact health. We expect to have some preliminary findings next year.

#### Opportunities for Public Health Researchers

In the future, there is potential for more researchers, particularly epidemiologists\* and bio-statisticians, to become involved with the study. Post-doctoral fellowships may be available. There is a wide range of epidemiology interest areas such as: genetic, molecular, nutrition, cancer, cardiovascular, sociology and healthy aging.

Ideally, we would like to have Seventh-day Adventists who have post-graduate degrees in Public Health research experience to help continue this study in the years ahead. Dr Gary Fraser, Principal Investigator of AHS-2, would be very glad to hear from any epidemiologist, graduate in public health or medical resident with an interest in this area.

\*Epidemiology, the scientific backbone of AHS-2, is the study of the distribution and determinants of disease and health in populations.

# Adventist Health Study 2

better health for everyone!



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## Report 2007

### Address Correction

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Please notify us if your address changes. >>>

Please **PRINT** clearly

FIRST NAME	MIDDLE INITIAL	LAST NAME
STREET		APT#
CITY	STATE	ZIP/POSTAL CODE
EMAIL ADDRESS		TELEPHONE

### Contact Information

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Gary E Fraser MD PhD

**Newsletter Editor:**  
Terry L Butler DrPH

**Telephone:**  
1 (800) 247-1699

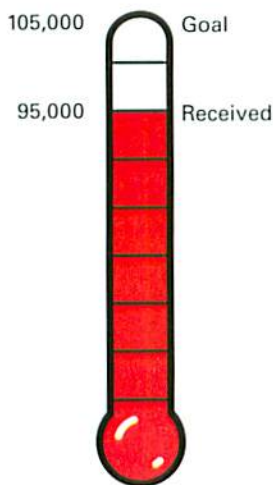
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Adventist Health Study-2  
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24785 Stewart St  
Loma Linda University  
Loma Linda CA 92350  
USA

**Enroll by phone call**  
1(877) 700-7077



### Enrollment Progress

**W**e're almost there! Another 5,000 enrollees will carry us over the critical mark of 100,000. That number will meet the expectations we made to the National Institutes of Health and ensure the study can achieve its research objectives. We're counting on those members who still have questionnaires at home to respond to the challenge to make up the shortfall. Enrollment is complete once the diet and lifestyle questionnaire is returned. Thank you again for being in the study and helping recruit others.

### Yes! We're Still Accepting Questionnaires.

**D**o you know someone who still has a lifestyle questionnaire at home? Can you pass the message on that it's not too late to return it? Probation is fast closing on our recruitment campaign. We've been going for five years now and it's time to wind down and move on to the follow-up and analysis aspects of the study. But we still need the outstanding questionnaires.

### Can You Help in the Last Enrollment Push?

We are asking all churches to give one final promotion for enrollment in AHS-2 and for the return of the questionnaire. Here's what you can do.

- Give a positive appeal from the pulpit and in Sabbath School classes
- Share the information in this newsletter with your church friends
- Place a notice in your church bulletin and on your church website
- Show the DVD, "Health Secrets of Living Longer"
- Encourage and help someone (perhaps a spouse) complete their questionnaire
- Remember every member 30 years and older can join even, those who do not regularly attend church