

Adventist Health Study-2—the Next 5 Years

We have a great study, and thank you for being a participant. As you can see below, we, along with you, have been busy. Together we have achieved much. Both the funding agency and external reviewers are very complimentary about the study design and our progress, and had no serious concerns.

Studies such as AHS-2 tend to set goals and be funded in five-year time blocks, and that is so for us. However, for the next few years we are not assured of funding from the federal government for the cancer part of the study—although we hope to finally succeed in this regard. We recently received a significantly better score than when we were funded 6 years ago, but research funds are extremely scarce at present—probably more so than at any other time in the last 40 years. Studies in nutritional epidemiology, which is where AHS-2 falls, at present have a lower priority with the funding agency than research on clinical treatments for cancer, or how genes influence the risk of cancer, for instance.

Unfortunately, a number of other well-known diet-cancer studies run by internationally recognized universities are also struggling for adequate funds. We are far from alone in this challenge. Several of our external advisors are the very best diet-cancer epidemiologists in the world and have similar problems with their research.

In the meantime we are finding alternative funding sources while we continue to apply to federal agencies. Loma Linda University is a critically important partner with the research team (all are LLU faculty) and is

...Next 5 Years, *continued on page 2*

Achievements in the Last 5 Years

▶	We have collected our baseline data from 97,000 Adventists members aged from 30-110 years of age at the time of enrolment. More than 25,000 of the participants are Blacks/African-Americans. Participants represent more than 4,000 churches throughout the geographical spread of US and Canada.
▶	By the end of 2008, 80,000 subjects will have also completed a detailed sun exposure questionnaire.
▶	Initial results from our large and comprehensive calibration study of 1000 representative subjects show very good validity for the estimation of dietary intake from our large questionnaire. Those in the calibration study completed six 24-hour dietary recalls, a second food frequency questionnaire, two one week physical activity recalls, and provided biological data.
▶	We continue to receive positive national and international media coverage. In the last six months BBC London and French television broadcast TV documentaries featuring the Loma Linda studies.
▶	Twelve manuscripts have been submitted to medical/health journals and others are in preparation. Presentations were made at national epidemiology and public health conferences and at the International Congress on Vegetarian Nutrition held recently at Loma Linda.

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This is one of the largest and most comprehensive studies of diet and cancer in the world. AHS-2 is poised to make important health discoveries in the next five years because of everything coming together: the initial funding from the NIH, the support of Loma Linda University School of Public Health, the vision of scientists, the commitment of church members, pastors, administrators, and the work of the research team.

...Next 5 Years, (Continued from Page 1)

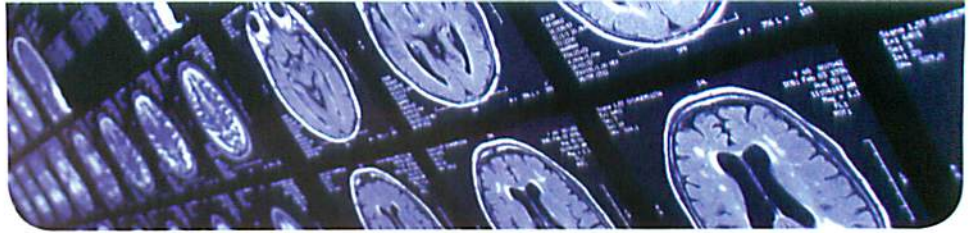
committed to the continued good health of the study. University administration and others are working to assure that there is a smooth transition and continued good progress using the best research methods.

So we are moving ahead, celebrating the nearly \$19,000,000 that we have received so far from the National Institutes of Health, and the truly great study that is now well underway. Remember, however, that this is a long-term study. The main results about diet and cancer are still 4-5 years away. In the meantime we will be able to study some other issues and report back to you on these.

Gary E. Fraser, Director, Adventist Health Study-2

The main goals of this study are to evaluate the effects of intake of soy, calcium, dairy foods, and omega-3 linolenic acid on risks of colorectal, breast and prostate cancers. Our study population has a very high range of exposure to each of these factors and the consumption of soy approaches Oriental levels. There is a broad spectrum of dietary habits with about 45% who are vegetarian.

Dr Fraser says, "The wide range of dietary habits is a very important feature of our study and makes it distinctive from many other large studies and is important for the study success."



Coping with a Catastrophic Illness

A Man with a Plan

Researchers have identified three basic determinants of health: heredity, environment and behavior. You have no control over your heredity and not much over the environment. But, you do have control over your lifestyle behavior. Unfortunately, despite living a healthy lifestyle a catastrophic illness like cancer can strike. It just happens less often.

This is what happened to W. Augustus (Gus) Cheatham who was diagnosed in January 2007 with a malignant brain tumor. Dr. Patti Herring talked to Gus, and shares his encouraging story—and how his wife, Ida, has lived with Multiple Sclerosis (MS) for over 40 years.

In 1985, Mr. Cheatham joined Loma Linda University as vice president for public relations and development and later as vice president for public affairs and marketing for all of the entities of Loma Linda University. His distinguished 22-year career marks the longest vice presidential tenure in this institution's history.

Q: Gus, can you us a little background history on your family?

A: My father pastored the large Berea Temple church in Baltimore and was then the president of the Allegheny East Conference for 13 years. Daddy was 92 when he passed away. My mother will be 105 on July 4th and still lives in the family home.

Q: What do you think is the secret of her longevity?

A: I do think that she and Dad worked outside in the garden for years—that, and living in the country. Their house is on 3 acres of land. And eating those fresh vegetables from that garden was very important to their good health. They also enjoyed family and loved their eight children. We were a happy household. It was a very positive kind of atmosphere in the Cheatham home.

Q: Have the family enjoyed good health?

A: My brain tumor is the most serious health problem of any of the children. Everybody else has been very healthy. Two of my brothers have had prostate cancer, but they are doing well.

Q: Can you tell us about your illness?

Addressing Black Health Issues

AHS-2 could help reduce health disparities and improve Black health in the USA. We need better understanding of disease causes in Blacks—and AHS-2 could give that breakthrough. Adventist Blacks may have lower rates of diabetes, hypertension, heart disease and cancer compared to Blacks in the general community. Diet, genes and lifestyle are important, but social, emotional and spiritual factors also influence quality of life.



Gus's Story

Early in January 2007 while sitting at my desk preparing for my 4:00 p.m. appointment I suddenly and without previous symptoms began to experience a seizure. My vision went from normal to flashing black and white lights. My body shook and jerked as I tried to hold myself still by grabbing my desk and armchair. The seizure seemed to stop as suddenly as it began. I felt no pain or dizziness. I completed my meetings scheduled for the day and went home to rest.

While seated in the family room,

I experienced another seizure. Early the next morning I went to the LLUMC Emergency Room. While there, I experienced another seizure, the third in less than 24 hours. An MRI revealed a golf ball size tumor on the right side of my brain. The tumor was removed surgically the next morning and found to be malignant. I have post-surgical paralysis on my left side, mainly affecting movement in my leg, arm and left hand. My right side remains strong. My sight, hearing, and cognitive skills remain normal. Since the surgery I have received 6 weeks of proton radiation treatment, and 3 weeks of chemotherapy. I participate in an aggressive physical and occupational therapy program at the Loma Linda University Rehabilitation Institute.

In addition I am following the recommendations based on findings from the Adventist Health Study and clinicians at the Cleveland Clinic. These include a plant based diet, limited sugar intake, fresh vegetable and fruit juices and maximize the drinking of water. I generally feel good, I'm able to do some walking and my left arm and hand are recovering slowly.

Ida Cheatham—MS patient for 40 years

While pregnant with my third child, I experienced a serious onset of weakness and numbness, which after many tests was diagnosed as multiple sclerosis (MS).



My condition deteriorated rapidly to the point that the doctor said that I would likely not survive the pregnancy if it was not terminated. However, my third child was delivered at the end of the 9 months. During that period I recovered significantly and was able to continue my profession as an elementary school teacher until 3 days prior to delivery.

When I was diagnosed with multiple sclerosis, there were no effective medications to reduce the symptoms and the progression of the disease. I therefore began to drink 10-ounces of fresh vegetable juice (kale, collard, carrots, beets) along with 60-ounces of water before breakfast which is often brown rice, beans and a fresh salad made of dark green lettuce and an abundance of fresh tomatoes.

Although my ability to walk has deteriorated over the years, I have always taken every opportunity to exercise. Despite being told more than 35 years ago that my disease was progressing rapidly and I would not likely live more than a year, I will soon celebrate my 45th wedding anniversary and enjoy the company of my 3 children and my 7 grandchildren. I have never taken medications to treat multiple sclerosis.

The Power of Positive Choices

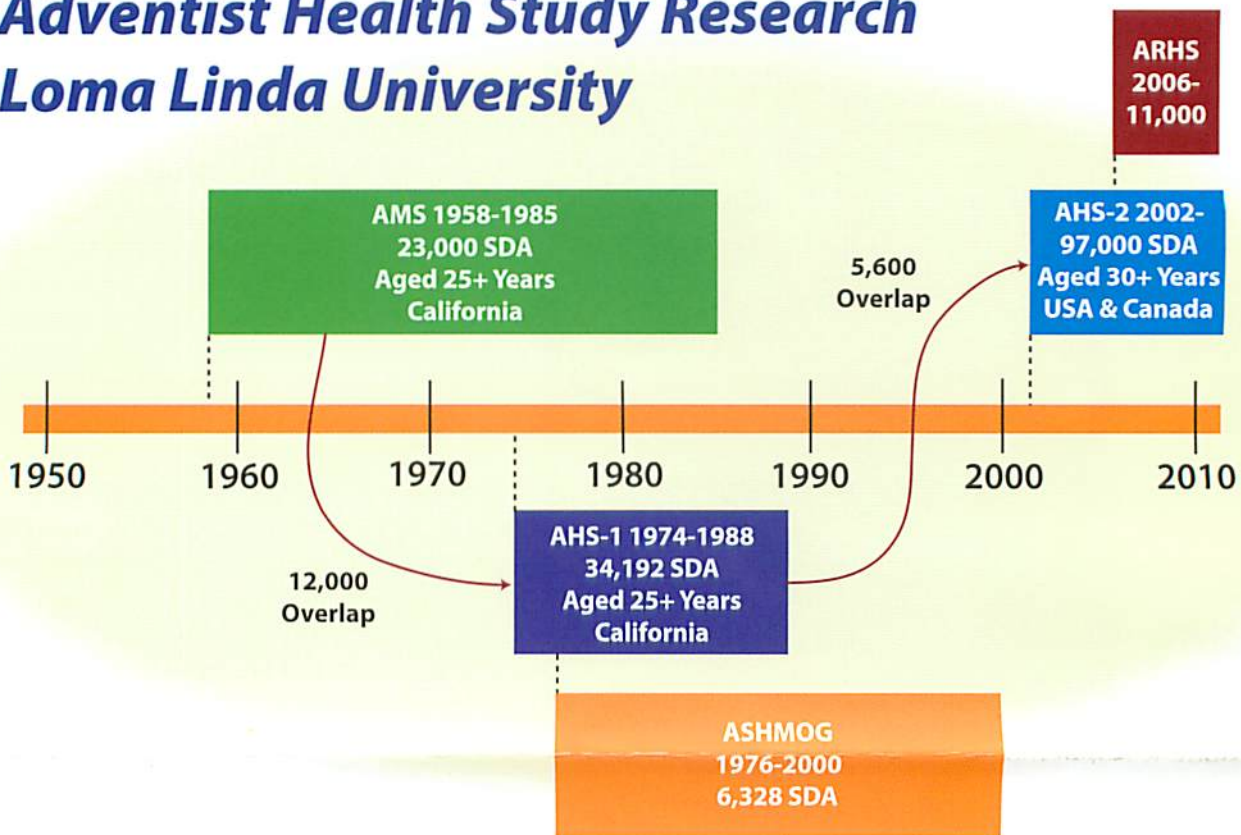
We appreciate Gus and Ida Cheatham for sharing their stories which illustrate how, despite positive lifestyle choices, we may not prevent the risk of all disease. Nevertheless, the positive choices we make, combined with gratitude and hope, are beneficial and can enhance our lives.

Seventh-day Adventists, for more than 140 years, have been blessed with health recommendations that can diminish the risk of certain diseases. But as we get older we are likely to suffer the same disease outcomes as others—just at a much later age.

The Adventist Health Studies will continue to research the various aspects of diet and lifestyle to identify specific factors that may reduce the risk of disease and improve quality of life—not just for Adventists—but for all peoples.

1958-2008

Celebrating 50 Years of Adventist Health Study Research at Loma Linda University



Dr. Frank Lemon's study titled "Causes of death among Seventh-day Adventists" later became known as the "Adventist Mortality Study." Prior to this time Dr. Mervyn Hardinge in the early 1950s had demonstrated the adequacy of the vegetarian diet among Adventists.

Little did Dr. Frank Lemon realize how his first epidemiology study of Adventists in 1958 would lead to major discoveries in health during the next fifty years.

The pioneering efforts of Dr. Lemon were followed by other Adventist Health Study principal investigators at Loma Linda University—Richard Walden, Roland Phillips, Jan Kuzma, Gary Fraser, David Abbey and Synnove Knutsen. These efforts have been largely funded by grants totalling more than \$40 million from the National Institutes of Health and other US agencies.

Many other researchers from Loma Linda have worked with these principal investigators to produce more than 150 manuscripts on the key findings of the Loma Linda Adventist Health Studies.

From the small beginnings when Loma Linda was known as "the farm" these studies have been on the cutting edge of lifestyle research; are some of the most comprehensive longitudinal studies in the world; helped in the global wars on tobacco and cancer; highlighted the benefits of the Adventist health message; given scientific support for healthy living and been featured in news media around the world. In addition, other similar, but smaller, population studies of Adventists have been conducted internationally.

We highlight some of the key results from these studies. Further details and references can be found at our website <www.adventisthealthstudy.org> and in Dr. Gary E. Fraser's book "Diet, Life Expectancy, and Chronic Diseases" published by Oxford University Press, 2003.

Adventist Mortality Study 1958-1966

23,000 Adventists aged 25+ years living in California

This study was conducted at the same time as the large American Cancer Society study of non-Adventists and comparisons were made for many causes of death between the two populations.

Key Results

Compared to other Californians, Adventists experienced lower rates of death:

- All cancers—60% for Adventist men and 76% for Adventist women
- Lung cancer—21%
- Colorectal cancer—62%
- Breast cancer—85%
- Coronary heart disease—66% for Adventist men, 98% for Adventist women

Adventist Health Study-1 1974-1988

34,192 Adventists aged 25+ from California

This cohort study was different to the earlier mortality study in that it investigated factors related to the incidence of disease and mainly compared Adventist with Adventist.

Key Results

- On average Adventist men live 7.3 years longer and Adventist women live 4.4 years longer than other Californians
- Five simple health behaviors promoted by the church for more than 100 years (not smoking, eating a plant based diet, eating nuts several times per week, regular exercise and maintaining normal body weight) increase life span by up to 10 years
- Increasing consumption of red and white meat was associated with an increase of colon cancer
- Eating legumes was protective for colon cancer
- Eating nuts several times a week reduces the risk of heart attack by up to 50%
- Eating whole meal bread instead of white bread reduced non-fatal heart attack risk by 45%
- Drinking 5 or more glasses of water a day may reduce heart disease by 50%
- Men who had a high consumption of tomatoes reduced their risk of prostate cancer by 40%
- Drinking soy milk more than once daily may reduce prostate cancer risk by 70%

In summary, frequent eating of fruits and vegetables lowers the risk of several cancers. Eating nuts and whole grains reduces the risk of heart attack.

Adventist Health Air Pollution Study (AHSMOG) 1976-2000

This was a sub-study of Adventist Health Study-1 which included 6,328 Adventists from California. The study was funded by the Environmental Protection Agency and linked the effects of various indoor and outdoor pollutants with respiratory diseases and lung cancer.

Adventist Health Study-2 2002-2008

97,000 Adventists aged 30 + years living in the USA and Canada

Preliminary Key Results

- 1% smoke tobacco
- 6% are current drinkers of alcohol
- About 50% drink soy milk (the relationship between soy milk and certain cancers and heart disease is one of the major themes of the study)
- There is a wide distribution of diet:
 - ▶ Total vegetarians (vegan)—4%
 - ▶ Lacto-ovo vegetarians—31%
 - ▶ Pesco vegetarians—11% (eat fish and dairy)
 - ▶ Semi-vegetarians—6% (eat meat more than once per month, but less than once per week)
 - ▶ Non-vegetarians—46%
- Type of diet is a significant factor for body weight:
 - ▶ Our data shows a progressive weight increase from a total vegetarian diet toward a non-vegetarian diet. For instance, 55 year old male and female vegans weigh about 30 pounds less than non-vegetarians of similar height.
 - ▶ The closer you are to eating a vegetarian diet, the better you can control your weight.
- Levels of cholesterol, diabetes, and high blood pressure, all had the same trend—the closer you are to being a vegetarian, the lower the health risks in these areas.

Adventist Religion & Health Study 2006-2008

11,000 Adventists aged 30 + years living in the USA

This sub-study of AHS-2 promises interesting results on the connections between religious factors, stress and health and is described further on page 7.

In July 2007, when the enrollment phase of AHS-2 finished, 97,036 Seventh-day Adventists from the USA and Canada had returned the 50-page lifestyle questionnaire. This was a mammoth response. Although we fell a little short of our goal, we have one of the largest research groups of its kind in the world. We are proud of the commitment of each participant and grateful for the thousands of church volunteers who promoted the

Enrollment to AHS-2 Tops at 97,000



Region	AHS-2 Subjects	Blacks in AHS-2	ARHS Subjects
Atlantic	6,654	3,836	915
Canada	4,450	721	
Columbia	10,574	4,080	1460
Lake	8,300	2,314	1078
Mid-America	7,675	934	925
North Pacific	13,696	311	1,567
Pacific	19,945	2,782	2,528
Southern	19,140	8,298	2,726
Southwestern	6,602	2,022	636

Number of Participants in AHS-2 and ARHS by Region

study. Our funding agency (NCI) and other researchers also acknowledge the achievement of this enrollment. The number of participants and Black participants in AHS-2 and the distribution of the 11,835 in the Adventist Religion & Health Study (ARHS) are shown for each Union territory in the chart below.

Why is the Follow-up Phase of AHS-2 Important?

Enrollment of participants into AHS-2 has finished. The initial baseline health history, lifestyle and dietary data of 97,000 participants is safely stored in the AHS-2 database. We are now in the follow-up phase of the study.

Preliminary analysis of this data is underway and each year we'll share results with you. But as you realize this is a long-term study. The most comprehensive and significant findings are yet to come—perhaps beginning in three or four years time.

You are just as important now in this follow-up phase of the study as you were when you first enrolled in the study two to six years ago.

In our previous California Adventist Health Studies (1958 and 1976) we had an enviable reputation of keeping track of our participants over many years of the study. Church clerks kept us up to date with church transfers and deaths of members. Individuals notified us of their change of address or withdrawal from the study.



In this AHS-2 study we want to maintain high response and the ability to keep in contact with folk. Let us know if you change address or transfer to another church. If a family member who is a study participant dies, please let us know. Your help and cooperation is valued.

This is what we plan in the follow-up phase of AHS-2

- Keep in contact with you
- Share study progress and findings each year
- We shall need to note any change in your address
- Every second year update information on hospital admissions
- Identify new cases of cancer, heart attacks and stroke
- Identify deaths of participants
- Continue to analyze data and write reports

Religion and Health

Study Progress

We are about halfway through the first 5-year phase of the Adventist Religion and Health Study and the data is attracting much attention. This sub-study of AHS-2 is funded by the National Institutes of Aging and is also known in scientific settings as the Biopsychosocial Religion and Health Study (BRHS).

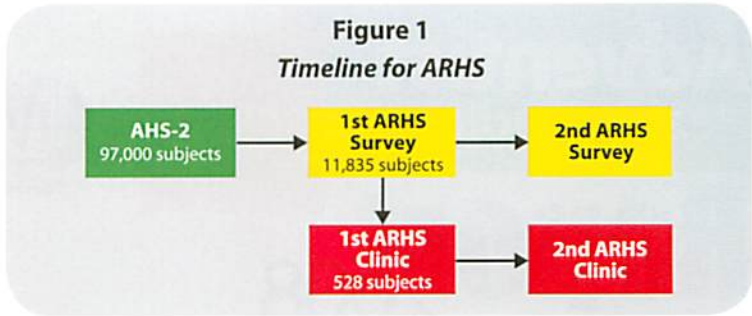
We have exceeded our goal of 10,000 members with more than 11,000 participants (3,500 Blacks and 7,500 non-Blacks) from among AHS-2 members in the US. As shown in Figure 1, the study has a survey and a clinical component both of which will be repeated in 2010. All 11,000 completed a comprehensive 20-page survey which included detailed measures of life stress, health, quality of life, religious activities and beliefs, dimensions of prayer, Sabbath rest and religious support.

The clinical component involved 528 participants fifty years and older from the greater Loma Linda area and areas of Los Angeles. Loma Linda doctoral students from psychology and public health assisted with clinics on Sunday mornings. Height, weight, body fat and blood pressure were measured; participants gave samples of blood, urine and saliva (to test for stress indicators) and also completed a memory test and an assessment for physical strength, balance and gait. Laboratory analyses are currently being conducted on the samples for markers of inflammation and other stress indicators.

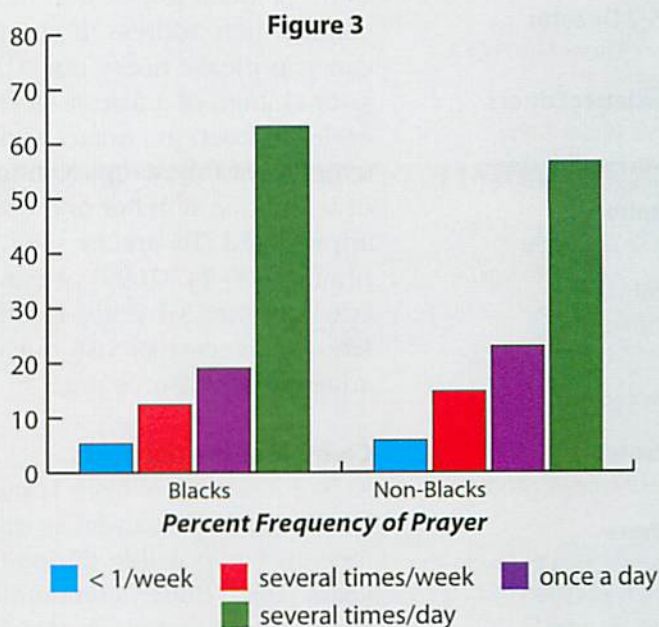
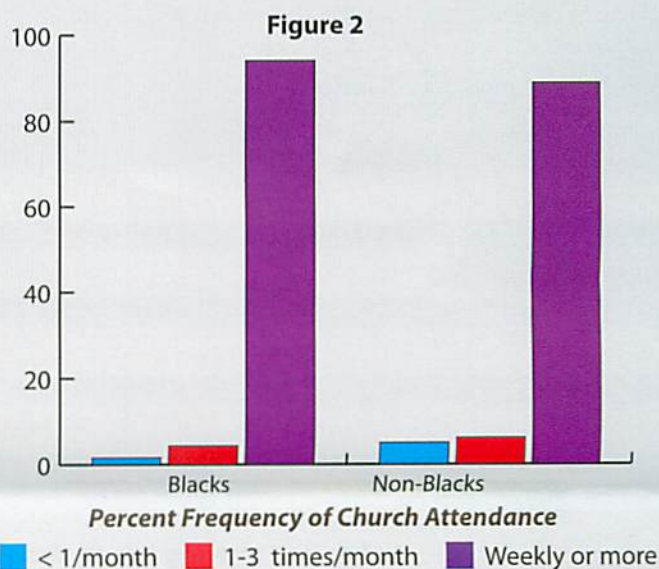
This study will provide a very extensive data set to explore a wide range of religious and health connections. Other studies, including AHS-1, have shown health benefits associated with church attendance. But this study, perhaps the most comprehensive investigation of religion and health, will go much further.

The main aims of BRHS are to examine:

- how aspects of religious experience may buffer the cumulative impact of stress in one's life on quality of life, health, and mortality;
- how aspects of religious experience relate to biologic indicators of stress, immune system function and coronary artery disease within the context of a stressful life; and
- whether these factors operate differently in non-Blacks and Blacks—Blacks being a group for whom religion may be more central in life and, perhaps, in health.



Figures 2 and 3 respectively describe the percent frequency of church attendance and prayer for the Blacks and Non-blacks in the study. Other reports will be shared in the next year.



Note: We will study the effects of prayer, the Sabbath, concepts of God, attitudes to the apocalypse, social support from church members, as well as other factors, on physical and mental health.

Adventist Health Studies

better
health for
everyone!

Report 2008



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Are you moving house this year?

Every year in the USA and Canada about 15% of the general population move house and change their address. If you are one of these can you please notify our AHS-2 office of your change of address? It makes it so much easier to keep in contact and reduces the expense of follow-up. Notification of change of telephone number and email is also appreciated. To update your contact details: phone (800-247-1699) or email (ahs2@llu.edu) or write Adventist Health Studies, Loma Linda University or visit our website, www.adventisthealthstudy.org.

Camp Meeting Reports

AHS-2 researchers from Loma Linda University hope to visit as many camp meetings as possible during the next five years. Terry Butler, communication and promotion director for AHS-2, says, "Subject to available funds we would like to visit 12-15 camp meetings each year. Participants are expecting feedback from the study and the camp meeting environment is one of the more personal approaches to share such."

Hospital History Forms Critical to Study Success

Every two years AHS-2 will mail you a Hospital History Form (HHF) to complete. This is a brief 4-page questionnaire that should **only take a few minutes** to fill in. Already since enrolling in the study you may have completed one or two of these forms. These forms may look similar but each HHF asks for updated information on any hospitalizations and diagnosis of cancer and other diseases you experienced since the previous HHF report. We may also ask you to update your contact information and some aspects of lifestyle and diet.

Your prompt response to these Hospital History Forms is much appreciated. If we don't hear from you within several weeks we send a duplicate HHF as a reminder. The success of the study during the next several years is very much dependent on having complete and up-to-date records of your health experience as it relates to the study. The more complete our data, the more valid are our results.

Address Service Requested