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## Health Problems of Selected LDS Missionaries Throughout the World

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HEALTH PROBLEMS OF SELECTED LDS MISSIONARIES  
THROUGHOUT THE WORLD

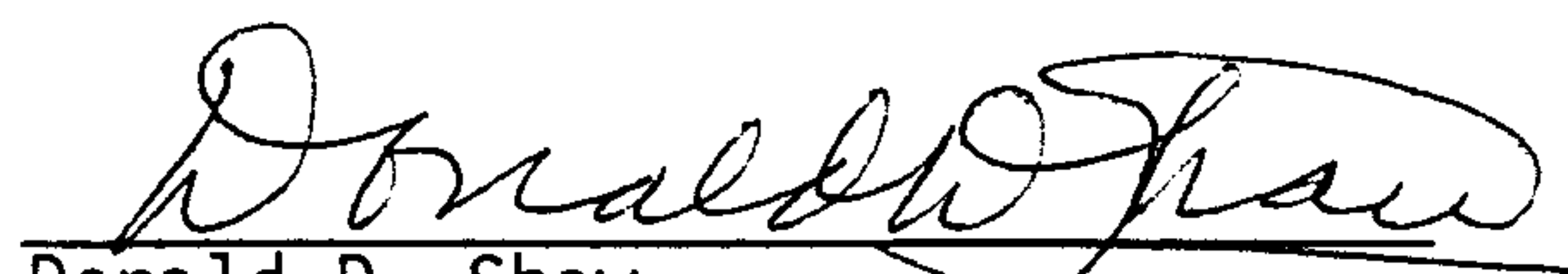
A Thesis  
Presented to the  
Department of Health Sciences  
Brigham Young University

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science


by  
Susan Jensen  
December 1981

This thesis, by Susan Jensen, is accepted in its present form by the Department of Health Sciences of Brigham Young University as satisfying the thesis requirement for the degree of Master of Science.

  
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Committee Chairman

  
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12-14-81  
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Department Chairman

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## Chapter 1

### INTRODUCTION

The Church of Jesus Christ of Latter-day Saints (commonly known as the LDS Church) currently has over 30,000 volunteer missionaries (1:5) serving within 190 missions throughout the world. (2) More than three-quarters (79 percent) of these missionaries are young men between the ages of 19-25. (1:5) Young women, commonly in the 21-30 year age range, represent 13 percent of that force and older couples represent 8 percent of the total. (1:5)

Missionary service in the LDS Church is a vital part of its organization. Members are taught from youth that one of their major responsibilities is to share the gospel with all peoples throughout the world. (3) Hence, many men and women answer the directive of their prophet-leader to serve voluntarily without pay for two years if a young man or one and one-half years if a young woman. Older couples may choose to serve six months, one year, or one and one-half years.

A significant concern of the LDS Executive Missionary Committee, which is comprised of church authorities, is the health of the missionaries--particularly those who serve in countries where the risk of disease is high. (4) Under the direction of the Missionary Committee, a mission president's survey was conducted in 1971 by the church's Health Services Corporation to discover the

extent of missionary health problems. It was determined that "72,000 missionary man-days were lost [that] . . . year due to illness."

(5:1) At that time the missionary force numbered 12,562 and thus, the per capita illness ratio was computed to be 5.73 days per missionary per year. (6:1) In 1974 that information was updated and "total lost time due to health-related problems in the mission field was estimated at 80,000 days." (7) The per capita illness ratio, however, decreased to 4.55 days, because of the increase in missionaries. (8) Although no new statistics have been generated between 1974 and 1980, it is believed that total lost time due to health problems has increased if for no other reason than the increased number of missionaries.

While it is known that there is a significant amount of lost time in the mission field due to injury and illness,

Understanding of missionary health problems is at present sketchy and inadequate. A need exists to more accurately identify the causes of missionary illness so that action can be taken to improve preventive efforts. (5:1)

Currently there is a paucity of published research on missionary health. Although independent researchers have studied disease related to the American traveler and serviceman in foreign countries, the research on missionary health is highly limited. (9:1) Because of the general dearth of relevant information on the topic of missionary health, the Mormon Church has found a need to more clearly define the health problems at hand; hence the following problem was proposed.

## Statement of the Problem

The purpose of this study was to determine the effect of illness and injury on Mormon missionary activity time.

### Subproblems

In addition to the general problem specified, the following subproblems were considered:

- 1 What was the effect of selected variables on ill missionary lost time and other dependent variables.
- 2 What social and emotional health factors, as reported by mission presidents, were related to missionary health?

### Null Hypothesis

Missionary illness and injury will have no effect on missionary activity time.

### Delimitations

The study was designed to identify variables related to injury and illness found among LDS missionaries serving in seven randomly selected missions throughout the world.

The main model in this study used mission, health, and sex as independent variables. Dependent variables included: hours worked, age, nativity, months in field, laboring city population, monthly mission cost, living conditions, diet, pre-existing conditions, adequacy of medical care, and specified social and emotional factors. One specialized model, however, utilized ill time lost,

companion time lost, and total time lost as dependent variables. Independent variables included: mission, sex, diagnosis, pre-existing conditions, preventive advice/instruction, medication taken, nativity, age, months in field, laboring city population, and monthly mission cost.

### Definitions

Adequacy of Medical Care. A subjective rating by ill missionaries as to their judgment of the quality of the medical care they received. It also referred to a subjective rating by well missionaries as to how adequately they judged the quality of medical care available in their mission.

Age. The number of years from birth to date of mission experience.

Balanced Diet. An average daily food intake composed of two items from the milk group, two items from the meat group, four items from the fruit/vegetable group, and four items from the bread/cereal group. (All food groupings are based on the Basic Four as espoused by the National Dairy Council.)

Companion Time Lost. Time lost by companions of ill missionaries from proselyting or welfare service assignment as a result of ill missionaries' injury or illness.

Elder. A Mormon male missionary.

Energy Level. The amount of energy a missionary judged he was using to accomplish his proselyting activities.

Frequency of Illness/Injury. The total number of injuries and illnesses experienced by the missionaries in selected missions throughout the world during a specified time-span.

Health. A term which described the physical condition of a missionary. If a missionary turned in an injury or illness report, his physical condition was classified as ill; otherwise, his condition was categorized as well.

Health Prevention Advice and/or Instruction. Advice and/or instruction given to missionaries which they felt specifically helped them avoid or prevent injury/illness.

Health Problem. An injury or illness reported by a missionary or mission president.

Hours Worked. The estimated weekly total number of hours that missionaries engaged in missionary activities.

Ill Time Lost. Time lost by ill missionaries from proselyting or welfare service assignment as a result of injury or illness.

Injury/Illness Preceding Mission (Pre-existing Condition). Any reported illness or injury which individuals experienced prior to full-time missionary service that continued to bother them while on missions.

Mission. A geographic region wherein missionaries are assigned to work under the direction of a mission president.

Mission President. "LDS official responsible for directing the missionary activities in designated geographical areas or missions." (7:2)



Missionary. One who is called by the President of the Mormon Church to serve as a representative of that organization for a specified length of time.

Missionary Activity Time. Time spent by missionaries in any one of the following activities; (1) studying church publications, (2) teaching church doctrine to non-members, (3) attending church meetings and filling church jobs when asked to do so by church authorities, (4) traveling from one place to another to find people interested in listening to their message, and (5) fulfilling welfare service assignments.

Missionary Committee. A committee composed of church authorities and leaders who oversees all missionary activity of the LDS Church throughout the world.

Missionary Effectiveness. A subjective term referring to a mission president's judgment of how effectively he thought a missionary taught church doctrine.

Missionary Emotional Health. A term referring to a mission president's rating of how emotionally healthy he thought a missionary to be and how happily engaged in a missionary work he felt a missionary was.

Missionary Interpersonal Relationships. A social factor in which missionaries were judged by their mission presidents as to how well they got along with their companions and others.

Missionary Motivation and Enthusiasm. A social factor in which missionaries were judged by mission presidents as to how self-motivated and enthusiastic they were.

Missionary Native. A missionary who serves his mission in his homeland.

Missionary System. "That system which includes selected members of the LDS Church whose objective is disseminating information about the church on a full-time voluntary basis for a specified length of time." (7:3)

Monthly Mission Cost. The amount of money expended by a missionary on living expenses in one month's time.

Months in Field. The number of months a missionary served on a mission.

Previous Episode of Injury/Illness. Any reported illness or injury by missionaries which was a reoccurrence of the same condition experienced earlier while in the mission field.

Proselyting. The time spent by missionaries in tracting and teaching church doctrine for the ultimate purpose of converting individuals to the LDS belief.

Sister. A Mormon female missionary.

Standard of Living. A subjective numerical description of living conditions in the mission field based on comparison with living conditions at home.

Total Time Lost. Combined time lost by ill missionaries and their companions from proselyting or welfare service assignment as a result of ill missionary health problems.

Welfare Service Assignment. A missionary assignment involving one or all of the following areas: "(1) serving as resources to welfare services committees, (2) teaching personal and

family preparedness, (3) utilizing community and church resources, (4) conducting welfare services proselyting, (5) promoting missionary well-being." (11)

## Chapter 2

### REVIEW OF LITERATURE

#### History of Mormon Missionary Work

Just before the resurrected Christ ascended into heaven, He charged His twelve apostles "to go out into all the world and preach the gospel to every creature." (12:105) In response to the Savior's instructions, the apostles proselyted in Palestine and in most, if not all of the nations surrounding the Mediterranean Sea. Despite an initial increase in converts during the apostolic period, however, Mormons believe a great apostasy gradually developed wherein true principles of the Church of Christ taught by the apostles were distorted into debasing rituals and corrupting doctrines. Eventually, the gospel was lost to mankind.

Mormons assert that a restoration of the true gospel occurred in the early eighteen hundreds and was brought about by divine revelation to Joseph Smith. This restoration culminated in the official organization of the Church of Jesus Christ of Latter-day Saints on April 6, 1830. Anxious to share the message of the Latter-day Saint Church with others and mindful of the charge given the ancient apostles by the Savior, Joseph Smith immediately began a missionary program. On April 11, five days after the organization of the Church, Oliver Cowdery "preached the first public discourse ever delivered by a Latter-day Saint elder." (12:105)

Shortly after this sermon, Joseph Smith, Oliver Cowdery, and Peter Whitmer, Jr., left on a mission to Colesville, New York, where Newel Knight, the first convert to the church, was baptized. Others from Colesville also joined and thus the growth of the church officially commenced. (12:105)

Another early Mormon missionary sent one month later was Samuel Smith--a brother to the Prophet Joseph. On June 30, 1830, he left his home to distribute the Book of Mormon (LDS scripture) in the countryside near Palmyra, New York. (13:47) Although he encountered persecution and little immediate success, a copy of the Book of Mormon that he had left with a minister of another faith eventually landed in the hands of Brigham Young, who later succeeded Joseph Smith in the presidency of the church.

Missionary work did not focus solely on U.S. citizens. Joseph Smith called four elders of the church in October of 1830 to preach the gospel to the Indians on the borders of Missouri. The Indians treated the missionaries kindly and listened with interest to their message. However, Indian Bureau agents soon became jealous of the Mormon elders and forced them off the reservation. (14:79)

Despite active opposition from others, the Church continued to grow and by the end of 1837 an estimated 20,000 people had joined the Latter-day Saints. (15:73)

The year 1837 proved to be a turning point in missionary work, for in June of that year Joseph Smith called Heber C. Kimball to venture across the Atlantic and open a mission in England.

The missionaries left their homes almost destitute, and arrived in their fields penniless, and yet made friends and

attained a success many would have thought impossible. . . . Just ten months after they had left the shores of New York, over 1,500 English citizens joined the LDS Church. (13:117-118)

Fifty-five thousand more Englishmen would also join in the next fifty years. (16)

The first actual foreign-speaking mission commenced in 1843 when four missionaries were called to serve in the Pacific Islands. One of the four elders did not reach his destination because he died at sea on the trip over. In spite of the loss of this missionary, the work was successful and "Two or three thousand natives of Tubuni, the Tuamotu Islands, and adjacent groups soon became identified with the Church." (17)

Missionary work slowed down tremendously during the mass exodus west to Utah. Persecution against the Saints had become so great that the "Mormons," as they had come to be called, were forced from homes in Illinois and hence fled to the "tops of the Rocky Mountains" where they established their settlements in the Great Salt Lake Valley.

Shortly after their colonizing trip west, missionaries were once again sent to preach to all the world. Scandanavia proved to be an especially fruitful field at this time. Some countries, however, refused to allow LDS missionaries to share their message within their borders. Speaking on this subject in 1925, Andrew Jensen, an assistant church historian, noted that:

If there are countries in the world which have not been covered by Latter-day Saint missionaries, it is surely not the fault of the Church nor is it to be ascribed to any neglect on the parts of its missionaries. It is mostly due

to the fact that religious liberty does not exist in all nations. (13:49)

Lack of religious liberty has been a major factor in the curtailment of missionary work in certain countries--both now and in the past. In early times, lack of religious freedom caused extreme persecution. Threats "to have roast missionary" occurred in the Society Islands (13:50) and two missionaries were murdered in the Southern United States. (13:50) Currently, lack of religious freedom rarely results in the murder of missionaries, but it does curtail the conversions of many truth-seeking people.

Missionaries of past decades proselyted in slightly different circumstances than their descendents. In Joseph Smith's time, missionaries would leave their families in the care of neighbors and depart to serve a mission without "purse or script" for as long as the president of the church indicated. Some missions were six months long, others lasted three years. Usually these early missionaries would travel in pairs, but not always. If assigned to a foreign-speaking mission, the elders were expected to learn the language while in the country because no formal language training or education program existed for the missionaries.

Gradually some significant changes occurred in the missionary program. Women began to be called in the 1850s and in the 1860s, missionaries were no longer required to travel without purse or scrip. (13:52) As time progressed, the rule to stay with a companion stiffened and missionaries were told to always remain in pairs. Presently the usual age for a young man to be sent on a mission is nineteen and for a young woman, twenty-one. These

missions last two years for the young men and one and one-half years for the young women. Older couples may serve six months, one year, or one and one-half years, depending on their preference. All missionaries now receive training and education concerning missionary work at the Mission Training Center (MTC) located in Provo, Utah. The MTC greatly aids missionaries in learning a foreign language and teaches them about the cultural customs found in the area they have been assigned.

This helps cushion the shock for the Idaho farm-boy suddenly immersed in the culture of Thailand or Tahiti or for the Japanese-American from Hawaii abruptly confronted with modes of living and thinking of his relatives in Japan.  
(18)

Along with the changes which have taken place in the missionary system, certain important factors have remained the same. First, all missionaries must be deemed worthy to serve missions. Second, all missionaries serve voluntarily without pay. Third, missionaries serve where they are sent--they ordinarily do not choose where they want to serve. Fourth, all missions are presided over by a mission president who has the responsibility of seeing that the mission is efficient and effective. Fifth, all mission calls come directly from the president of the church.

In 1974 President Spencer W. Kimball, current president of the Mormon Church, stated:

The question is frequently asked: Should every young man fill a mission? And the answer has been given by the Lord. It is "yes." Every young man should fill a mission.  
(15:625)

In response to the statement of President Kimball, whom Mormons regard not only as a president but as a prophet, seer, and revelator,



missionary numbers have greatly increased. When this man took over the presidency approximately 16,000 missionaries were serving in the field. In six years, that number has climbed to approximately 31,000. (19:3) Predictions indicate that if the growth rate of the church and missionary program continues, by 1985 the missionary force will have increased to 50,000. (19:3)

Nonmembers of the church may find missionary work "one of the numerous distinctive features of the Church and at the same time, one of the most puzzling. . . ." (13:46) Many may wonder why the church continues to increase its missionary force and program. In answer to the puzzlement and questions of nonmembers, it must be explained that Mormons believe one of their most important duties, as stated by Abraham the ancient prophet, is to preach the gospel. They believe their gospel is the restored Church of Christ, and by following the precepts taught therein, they may receive a completeness of joy and happiness. Their desires to share this message of happiness with others as well as obey the divine injunction of their prophet-leader cause many to serve missions.

Missionary work within the Mormon Church will continue to grow. Mormons picture a time when their message will be taught to "all nations, kingdoms, tongues, and peoples," and "will cover the earth as with a blanket." (15:625) This work, Mormons believe, is destined to succeed. They exclaim with the prophet Joseph Smith that:

The Standard of Truth has been erected; no unhallowed hand can stop the work from progressing; persecutions may rage, mobs may combine, armies may assemble, calumny may defame, but the truth of God will go forth boldly, nobly, and

independent till it has penetrated every continent, visited every clime, swept every country, and sounded in every ear, till the purposes of God shall be accomplished, and the Great Jehovah shall say the work is done. (1:6)

### Related Literature

The Church of Jesus Christ of Latter-day Saints is not the only religious group with an organized missionary program. Catholics and Protestants alike have long heritages of missionary work associated with their respective religions. It is probable that Catholics trace back their missionary program to Peter and the twelve apostles while Protestant religions vary on their origins of missionary work. Presently Protestant religions in the United States have a combined total of 35,000 missionaries (20) while Catholic missionaries total 6,455. (21)

With such a large population of missionaries, illness and injury have been inevitable. In earlier days, missionaries suffered and sacrificed greatly--many to the point of death.

Accounts of some missionaries of . . . over 150 years ago end as follows: "jungle fever," "massacred by cannibals," . . . "thrown from sofa in cabin--shattered nerves," . . . "bleeding of the lungs," . . . and again and again, "cholera"--"cholera"--"cholera!" (22:184)

With the advent of modern antibiotics and the vastly improved practice of medicine, missionary deaths and the incidence of illness has greatly decreased. A smug attitude of "all is well," however, is certainly not justified. Missionaries often work in developing countries where sanitary conditions and health facilities are inadequate. In addition, they work closely with the indigenous population, which sometimes harbors serious infectious diseases that

spread quickly to missionaries and their families. Consequently, missionaries contract illnesses that they never would have been exposed to had they remained in their native country. The problem of illness and injury while on a mission is a real concern.

#### Current Research

Research on the health problems of Catholic and Protestant missionaries has been limited during the past twenty years. Nevertheless, three computer searches uncovered eight pertinent articles on missionary health written between 1967-1975. The majority of these articles dealt with the incidence of viral hepatitis, the others with sundry other maladies. A condensed summary of the findings of these articles follows.

In 1967, Dr. Allen Cline, Dr. James Mosley, and Dr. Frederick Scovel wrote:

It is the impression of many physicians that the incidence of viral hepatitis among Americans abroad is much higher than that in the United States. There is very little information available, however, to assist them in determining whether this is indeed true. Attack rates have only been determined for military populations, and may not apply to civilians who obviously live under very different circumstances. (23:119)

Consequently, this group of researchers decided to study the incidence of viral hepatitis among American missionaries since they lived so closely to the native population in hyperendemic areas. Dr. Cline and his colleagues found the risk of viral hepatitis high among Protestant missionaries. In a later study initiated by Dr. Mosley, it was reported that if attack rates per 100,000 people in the U.S. were compared with the attack rates of missionaries, "the

expected adjusted total incidence of hepatitis A and B combined would be 1,301.0 per 100,000 for missionaries, compared with an adjusted total rate of 24.2 per 100,000 at current rates in the United States." (24:227) This report also indicated the geographic area with the highest incidence of hepatitis was the Middle East and North Africa. (24:228) Central America and South America were second. (24:228)

In another study, Dr. John D. Frame reported that Protestant missionaries in Ethiopia "were . . . 450 times as likely to get hepatitis in their first year in Ethiopia as they would, had they been at home in the United States during a year of high incidence." (25:103)

Viral hepatitis rates abroad were also studied among the Catholic missionary population by Dr. Woodson and Dr. Cahill. Their findings supported research done on Protestant missionaries. They found that "a missionary living in many of the Central American and South American countries for ten years had a chance of developing hepatitis in excess of 40 percent." In addition, their study "clearly showed . . . that risk of contracting hepatitis diminished only slightly . . . after the first ten years abroad." (26:1,193)

As can be seen from the reported literature, hepatitis is indeed a risk to missionaries in hyperendemic areas. However, gamma globulin injections given at quarterly intervals are known to be effective against viral hepatitis (26:1053) and currently are being used as a protective measure. It is believed the incidence

of viral hepatitis among missionaries has been greatly reduced since the introduction of gamma globulin.

In addition to reports on hepatitis among missionaries, articles on the following topics have also been published: lassa fever incidence among missionaries, incidence of parasites and worms among missionaries, mental health profile of potential Protestant missionaries, and a description of health problems found among the children of missionaries. A brief summary of the conclusions arrived at in these articles follows.

First, an article on lassa fever among missionaries stationed in West Africa was published in 1975 by Dr. John D. Frame and confirmed that lassa fever virus had now been documented in Malai, Central Africa-Zaire and the Ivory Coast. Dr. Frame also reported that the symptoms and outcome of lassa fever were not always as severe as previously described.

Second, an article on parasites and worms reported that nearly 24% of 4,315 missionary personnel harbored pathogenic amebae. The article also documented a high rate of worm infestation among missionaries.

Of the 4,871 persons examined [missionaries and their families], 2,889 (59.3%) were adults and 802 (16.5%) were children from five to nine years old. Only 1.4% of the children were less than 1 year old. One or more intestinal helminths were found in 20% of the group, as evidenced by the presence of either eggs or larvae or both, enterbiases having been excluded by the cellophane tape method. Worms were present in 16.2% of the adults and in 32% of the children from five to nine. (28:162)

One unfortunate male missionary

Who had been in Venezuela had in addition to *Strongloides stercoralis* the following: Hookworm, *Trichuris*, *Ascaris*,

E. histolytica (large race), E. histolytica (small race),  
E. hartmanni group, E. coli, and E. nana. (28:164)

Third, a mental health profile of potential Protestant missionaries indicated the following:

Although some individual variations were found, we were impressed by the persistent similarities in the 50 missionary candidates' basic personalities. Superficially, the candidates were well aware of social amenities, appearing friendly and polite but reserved. On a deeper level, constriction was the most outstanding feature. . . . However, despite this personality feature the candidates led energetic, altruistic, and productive lives professionally and socially. In work situations, they completed their jobs efficiently and maintained friendly relationships with their co-workers and supervisors. (29:363-4)

Fourth, a health profile of 140 missionary children conducted by John D. Frame and James P. Carter brought to light the following findings:

Unexplained diarrhea, primary tuberculosis, and hepatitis were the most common bacterial and viral diseases which occurred in this group which might not have occurred had . . . the children remained in the United States. Parasitic diseases were also common. In addition there appeared to be a high over-all incidence of minor congenital malformations in this group. . . . (30:271)

In summary, little has been published on missionary health. There exists a need for more research to be done in this area in order to upgrade and improve the health of missionaries everywhere. Presently, Dr. John D. Frame, director of the Associated Medical Missions' Office, is the only individual that this author knows who is doing any current research on Protestant missionary health. It takes more than one person, however, to research an area as broad as missionary illness and injury and so current research being conducted by the LDS Church will be a welcome addition to the published literature on this topic.

Specific Literature

"The preservation of health is a duty." (32)

Since the organization of the Mormon Church 150 years ago, relatively little public information has been written or published on the health of Latter-day Saint missionaries. Substantial research has been conducted, however, on the health of the Mormon people as a whole. Since LDS missionaries are a subset of the foregoing population, the author will briefly include the findings of a few of the more current studies.

In 1974, Dr. James Enstrum, a non-member of the Church, reported that Latter-day Saints living in Alameda County "had a mortality rate only 55% as great as the total sample in the county." (33) The article also stated that in relation to the entire population of California, "Latter-day Saints experienced only about 50% of expected deaths from all causes and from cancer of all sites." (33)

Another study in 1973 reported "Utah residents, about 72% of whom are Latter-day Saints, experience total mortality and cancer mortality rates that are the lowest in the United States." (33)

Many people believe the positive research findings are due to the Mormons' adherence to a "strict" health code, commonly called "the Word of Wisdom." This Word of Wisdom, Mormons believe, was given as revelation from God to the prophet Joseph Smith in 1833. Included in the revelation are six basic health concepts. They are the following:

1. "It is not good to drink wine or strong drink. . . ."
2. Tobacco is not good for man.
3. Hot drinks are not good for man. (Hot drinks are interpreted by Church leaders to mean tea and coffee.)

4. Herbs and fruits are "ordained for the constitution, nature and use of man." They are to be used with prudence.

5. The flesh of beasts and fowls is to be used sparingly by man.

6. "All grain is ordained for the use of man and of beasts, to be the staff of life. . . ." (34)

Although the revelation was originally given as a "greeting," it was later adopted as a commandment by the church, and since the time of Heber J. Grant (a successor to Joseph Smith), no one is allowed to accept the assignment of full-time missionary work if he/she uses alcohol, tobacco, coffee, or tea.

In contrast to the consequences experienced by the violator, all Saints who abide by the Word of Wisdom and are obedient to the commandments of God are promised "health in their navel and marrow to their bones; And shall find wisdom and great treasures of knowledge, even hidden treasures; and shall run and not be weary and shall walk and not faint." (35)

Partially because of adherence to the Word of Wisdom, Mormon missionaries are generally healthy and strong. Nevertheless, their work sometimes exposes them to contaminated areas filled with disease-producing bacteria, fungi, viruses, and other organisms. In addition, missionaries encounter unsafe environmental conditions that lead to occasional accidents and injury. Up until 1970, however, no significant research had been conducted on the specific causes and frequencies of missionary illness and injury.

October of 1970 proved to be the turning point in the study of LDS missionary health. In October the Church announced the formation of a Health Services Corporation which was to be directed by a health services commissioner. The first commissioner was



Dr. James O. Mason. Dr. Mason brought impressive qualifications to the commissionership. He received his M.D. from the University of Utah and later his Ph.D. in Public Health from Harvard University. After completion of his education requirements and military duties, he accepted a position as deputy director of the Center of Disease Control in Atlanta, Georgia. It was while serving in Georgia that he accepted the position of commissioner of health services for the church. (36:4)

In accepting this position Dr. Mason outlined some goals for the Health Services Corporation:

We not only will conduct the business of caring for the sick, but also hope to carry educational activities related to the rendering of care to the sick and injured in the promotion of health. . . . In addition, the corporation also will sponsor and conduct scientific research. (37:5)

True to his word, one of the first items on his agenda was research related to the health needs of approximately 12,000 missionaries. Research commenced in 1971 and consisted of mailing a questionnaire to 98 mission presidents throughout the world. These mission presidents were to report the frequency of certain diseases among their missionaries as well as answer questions pertaining to medical costs, preventive health measures and practices within the mission, and proselyting days lost by the average missionary due to illness. Eighty-five mission presidents responded and the findings showed gastro-intestinal and respiratory illnesses to be the most common ailments. In addition, it was found that Asia had the greatest incidence of illness.

The validity of the study was questionable because it was based on "approximation and memory." (38) Inaccuracies were inevitably reported and consequently the tabulated data was not as accurate as would have been desired. In a personal interview, Dr. Mason readily admitted this problem, but stated the research was the best that could be done at the time due to constraints of money, time, and permission. (38)

Dr. Mason followed this study with a tour of the mission fields in Central and South America, Asia, and the Pacific Islands. In every mission home he visited, Dr. Mason found four to six missionaries convalescing from hepatitis. Gamma Globulin injections were then prescribed in countries with high hepatitis rates and the number of cases fell to 1-2 cases per mission home. Of those individuals who still contracted hepatitis it was discovered they usually hadn't been administered the gamma globulin injections. (38)

During Dr. Mason's tenure in office, a study was also conducted in the Philippines where it was found that over a period of time the average number of proselyting days missed due to illness and/or injury dropped from seventeen days to five days. Some factors that may have contributed to this decline were:

1. Pre-mission screening. This included medical and dental examinations and medical screening of missionary applications. Mission presidents . . . were also informed of noted missionary problems.
2. Immunization programs. These . . . included stringent regulations and immunizations given at the initial mission home.
3. Post-mission screening for specific diseases among missionaries from high risk areas, i.e., tuberculosis.
4. Quarterly gamma globulin injections in high risk missions for protection against infectious hepatitis.
5. Education. (7:2)

In 1975 another study was conducted on missionary health.

The purpose was to:

Bring about a more descriptive and comprehensive understanding of medical disorders causing the leave, release, and transfer of missionaries. The study compared a group of 300 missionaries representing those in 1975 (up to November) who suffered mission disruption with an equally sized control group matched for age, sex, and mission.

One important objective of the study was to see if comparative testing of certain variables would reveal indicators with significant predictive value for identifying potential disruptive medical problems. (3:7)

The analysis of the study showed some interesting results.

First, females appeared to be significantly more susceptible to disorders. "Of the three hundred cases experiencing mission disruption, 27.7% were female. Quantitatively . . . sister missionaries have double their proportion of problems." (39) This held true in all areas listed except in psychosomatic disorders. Second, home residency appeared to have no effect on whether or not a missionary's service was disrupted. Third, the geographic region to which a missionary was sent appeared to play a part in the incidence of mission disruption. There were more cases of mission disruption from Europe than from Asia and the Pacific Islands. Fourth, age was an influential factor in determining what disorders caused mission disruption.

Those in the 30-64 age groups had comparatively fewer orthopedic and psychosomatic problems . . . while experiencing excesses in chronic illnesses. . . . What is said for the 30-64 age group, can also be said for the 64 plus age group since they, interestingly, approximate each other for all disorders. Those of the 25-29 age group had a significant reduction of gastro-intestinal problems and a marked increase in psychosomatic/emotional disorders. There were no significant deviations from the norm for the 19-24 age groups. (39)

Fifth, of those who left the mission field, the majority had served nine months or less. (39)

#### Summary of Review of Literature

This review of literature has included a history of LDS missionary work and a review of recently conducted research on missionary illness and injury. Due to the dearth of information on this subject area, the Church of Jesus Christ of Latter-day Saints has deemed it wise to study the characteristics and frequencies of illness and injury among LDS missionaries. Consequently, the following research was proposed.

## Chapter 3

### PROCEDURES

The purpose of this study of LDS missionaries was to determine the effects of illness and injury on missionary activity time.

The following procedures were utilized in order to achieve the intention of this thesis.

#### Population Identification

The population studied consisted of full-time missionaries of the LDS Church whose service in the mission field partially or completely spanned the time period from December 1, 1979 to March 1, 1980.

#### Sampling Techniques

A stratified random sampling technique was used in the study as the following explanation will confirm.

Missions throughout the world were categorized into one of seven major geographic regions. These regions were: (1) U.S. and Canada, (2) Mexico and Central America, (3) South America, (4) Asia North, (5) Asia South, (6) Europe, and (7) South Pacific. After the missions were classified into regions, the names of every mission found within each of the seven geographic areas were then placed into a hat and one mission from that region was randomly selected to

participate in the study from December 1979 to March 1980. Two other missions from the same region were then randomly selected to take part in the project during different four-month periods, i.e., April 1980-July 1980 and August 1980-November 1980. A final mission was selected from that region to participate in the research project for one entire year from December 1979 to November 1980.

This procedure of selecting four missions from each region was followed in all 7 regions. However, only missionary health data received from missions in the first four month period (December 1979 March 1980) was available in time to be analyzed for this report. Hence, while 28 missions were actually surveyed in this project by the Church Welfare Services, only results from 7 of the missions were reported in this paper.

The number of ill health surveys received for this research report was dependent on the number of missionaries who reported illness or injury in each of the participating missions. The number of well health reports received was based on the size of individual missions' well population. Either thirty randomly selected well missionaries within each mission or 25% of the well missionary population in each mission were asked to submit health survey forms. The decision of which sampling method to use in each mission was based on statistical analysis considerations.

Twenty-eight mission presidents composed the third group sampled in the project. These administrators were surveyed for responses to a mission health questionnaire.

### Data Collection

Data collection was accomplished by the use of five questionnaires designed by the LDS Health Services Corporation. A brief description of the questions follows: The first instrument was titled "Mission President's Survey of Missionary Illness and Injury." It was administered once to 28 participating mission presidents. Quantitative estimates by the mission presidents on the overall physical and mental health of missionaries were requested. The second questionnaire was called the "Ill Missionary Profile." "The ill missionary profile asked . . . mission presidents (in the seven surveyed missions) to make judgment concerning each ill missionary's social and emotional adjustment, personal commitment, personal energy and proselyting effectiveness." (5) The third questionnaire was entitled "Well Missionary Profile." All missionaries who did not send in an illness/injury report during a four-month period were judged "well" and their mission presidents were asked to rate these individuals on the same qualities found on the ill missionary profile, i.e., "social and emotional adjustment, personal commitment, personal energy and proselyting effectiveness." (5) The fourth questionnaire was termed "Missionary Illness and Injury Report Form." "This form was to be completed each time a missionary experienced an injury or illness during the study and was mailed to the mission president with the weekly proselyting report." (5) This form asked for information relating to the specific illness/injury suffered and also requested a history of health factors which may have contributed

to the disorder. The last instrument was also called "Missionary Illness and Injury Report Form." However, it was different from the previously mentioned questionnaire in two important ways. First, it was given only to those missionaries who had not reported any illness/injury during the time their mission had been involved in the health survey program and secondly, the questions dealt mainly with general health conditions within the mission field.

See Appendix for attached copies of all questionnaires.

### Research Design

This study used a true experimental post-test only research design. All missionaries were asked to submit injury reports when ill. These reports were contrasted with forms submitted from "well" missionaries who did not report an injury/illness during the span of the research program.

The data collected from the foregoing surveys was used in one model to discover the effects of the independent variables (mission, sex, health, and their interactions) on the dependent variables (age, hours worked, native, months in field, laboring city population, monthly mission cost, living conditions, diet, pre-existing conditions, energy levels, adequacy of medical care, and emotional and social factors). In addition, another model employed ill time lost, companion time lost and total time lost as dependent variables to determine the effect that the following independent variables had on them: mission, sex, diagnosis, preexisting conditions, preventive/advice/instruction, medication taken,



nativity, age, months in field, laboring city population, and monthly mission cost.

Chi square and analysis of variance was employed to analyze the data gathered since the response modes required nominal independent and interval independent answers as well as interval dependent responses. In addition, analysis of co-variance was utilized in order to determine those factors which were significant predictors to illness/injury.

A confidence level of .05 was used for the analysis of variance and analysis of co-variance tests.

After the data was properly collected and analyzed, conclusions and recommendations were made.

## Chapter 4

### ANALYSIS OF DATA

The purpose of this study on Mormon missionaries' health was to determine the effect of illness and injury on missionary activity time. In actuality, this statistical determination was of only academic importance as the subproblems of this thesis addressed the more significant issues of missionary health.

The analysis used in this research project classified ill missionary reports into one of three categories: (1) premier initial, (2) initial, and (3) subsequent. A premier initial report was an artifactual category created and imposed by the analyzers of this study on the survey responses. It literally meant the "first in time" initial report and referred to the earliest account of illness or injury by an ill missionary during the four-month survey period. An initial report was no different from a premier initial report in definition except it described a new injury or illness which occurred later in time.

The missionaries themselves made no distinction between premier initial and initial on their report forms; instead they simply differentiated between initial and subsequent reports. Every time a new illness or injury developed an initial report was filed. If the health problem was a continuation of a previously reported injury or illness, however, it was filed as a subsequent report.

The artifactual category--premier initial--was developed by the analyzers for the purpose of avoiding bias in statistical calculations. While it was true some data was lost from the ill missionaries because most comparisons between ill and well missionaries utilized only premier initial reports without any other initial or subsequent reports, it was believed the advantages of using only premier initial reports far outweighed the complications which would have arisen if all initial and all subsequent reports were used. The logic behind the decision to eliminate all ill reports except premier initials follows.

During the four-month period, certain missionaries experienced more illness and injury than others. While the majority of ill missionaries only reported one illness or injury during the survey period, several ill missionaries did submit more than one initial and subsequent report. Consequently, repeated measures were obtained from some ill missionaries, but not from others. Only one response was obtained from "well missionaries." Analytical difficulties emerged when one tried to combine responses of some ill missionaries who had repeated measures with other ill missionaries who only had one measure and then compare that "ill" group to well missionaries with only one measure.

The decision in this analysis was to simply compare ill premier initial reports to well reports. While it is conceded some data was lost, no other viable solution appeared to be available.

Average Hours Worked

Question One on both the well and ill missionary survey forms requested that the respondents estimate the average hours worked per week in missionary activity over a three-month period. One hundred and seventy-two responses were received from the well missionaries and three hundred and sixty-two premier initial reports were received from the ill missionaries. Well missionary estimates ranged from 10 hours to 128 hours per week, the majority falling between 65-84 hours. These responses were not normally distributed. The well missionary mode, median, and mean was computed to be 70, 76.5, and 74.26 hours respectively. Ill missionary reports which were also not normally distributed ranged from 0 to 114 hours, most falling between 72.5 and 82.5 hours. (Twelve ill missionaries reported weekly work averages to be between 184-199 hours. There are only 168 hours in one week; consequently, those who reported more than 114 hours were recoded as missing values.) The mode for the ill missionaries was the same as the mode for the well missionaries--80 hours. The ill median was 76, slightly less than the well median. There was a minor difference between means of the ill and the well, the ill mean being 75.25--approximately one hour more than the well. Table 1 on the next page presents this data in more detailed form.

In order to determine whether the difference in means between well and ill missionaries was statistically significant, a general linear model was formulated. The model was represented as follows:

$$\text{AVERAGE WEEKLY WORK HOURS} = M + M_i + S_j + MS(ij) + H(k) + MH(ik) + SH(ik) + MSH(ijk) + E$$

Table 1

Frequency Distribution of Ill and Well Missionaries by Average  
Weekly Work Hours (Including Study Time)  
Dec. 1, 1979 - March 30, 1980

Amount of Hours Worked	Ill			Well			Both		
	Ct.	%	Cum. F.	Ct.	%	Cum. F.	Ct.	%	Cum. F.
0-60	34	9.8	9.8	26	15.1	15.1	60	11.2	11.2
61-70	92	25.0	34.8	43	25.0	40.1	135	25.3	36.5
71-80	141	40.0	73.8	46	26.8	66.9	187	35.0	71.5
81-90	76	21.0	94.8	40	23.2	90.1	116	21.8	93.3
91-110	17	4.6	99.4	15	8.7	98.8	32	6.0	99.3
111-130	2	.6	100.0	2	1.2	100.0	4	.7	100.0
Total	362	100.0	100.0	172	100.0	100.0	534	100.0	100.0

$M_i$ : mission

$S_j$ : sex

Hk: health

MS(ij): mission x sex

MH(ik): mission x health

SH(ij): sex x health

MSH(ijk): mission x sex x health

E: error

Each major class, i.e., mission, sex, and health, had more than one level enclosed within it. Mission had seven levels, one for each of the seven missions studied; sex had two levels, one for male and one for female; and health also had two levels, one for well and one for ill.

In this model, the only variable that proved to be significant at the .05 level of confidence was mission. Translated into practical terms, missionaries in England (London East) appeared to work the longest hours and were followed by missionaries in Mexico (Mexico City North). Philippines (Davao) mission ranked third and Japan (Tokyo South) mission ranked fourth. California (Fresno) was fifth and New Zealand (Wellington) was sixth and Bolivia (La Paz) was seventh at 67.16 hours. Table 2 resummaries this data and includes all means.

The only other variable which was close to the .05 level of significance was sex at a .0773 level. This trend showed that male missionaries tended to work longer hours than female missionaries. Table 3 shows this trend in statistical form. One assumption for

Table 2

Frequency Distribution of Missions by  
Average Weekly Work Hours  
Dec. 1979 - March 1980

Mission	Average Weekly Work Hours
California (Fresno)	71.44
Philippines (Davao)	74.29
Japan (Tokyo South)	73.54
Mexico (Mexico City North)	78.53
England (London East)	79.30
Bolivia (LaPaz)	67.17
New Zealand (Wellington)	69.19

Table 3

Frequency Distribution of Male and Female Missionaries  
by Average Weekly Work Hours  
Dec. 1979 - March 1980

Missionaries	Average Weekly Work Hours
Male	78.85
Female	71.84

this difference may be due to the fact that females typically require more time for daily personal care and thus spend a few less hours per week in missionary activities.

The most surprising result from the survey responses was that the ill missionaries reported about the same average weekly hours as the well missionaries. One would normally assume that ill missionaries would work less hours--at a statistically significant level. One possible reason why ill and well missionary estimates were so similar was because all missionaries were asked to include study time within their estimated averages. Missionaries who were sick enough to miss a day of proselyting, could conceivably have been well enough to study in their apartments. Thus ill missionaries who studied in bed would not have lost any work hours while ill or injured.

Another factor which most likely played a part in the result was the fact that missionaries could have filled out their premier initial reports at the beginning of their illness. Missionaries were not told when specifically to fill out their illness/injury report form during a week. They were given the option by default to fill it out at their convenience and thus missionaries may have filled it out any time during the illness or after the missionary got well so long as that occurred before the mission weekly report was due. Hence if a missionary did in fact fill out a form at the beginning of his illness, then very little (if any) impact would have occurred on the average hour worked.



It also must be pointed out that average weekly estimates over a three-month period would not have been affected drastically by an episode of illness lasting one to three days. And since the median duration of illness was in fact only three days, ill missionaries would not have been missing a great deal of work over a span of three months.

One last point to note is that estimates between ill and well missionaries was not found to be statistically different at the .05 level. Hence, there is the possibility that the results obtained were not an accurate depiction of reality and consequently, continued research being conducted by the Church Welfare Services department in various other missions for a longer period of time (one year) will be vital on determining whether or not actual differences in average weekly work hours do exist between ill and well missionaries.

#### Subproblems

The research study on missionary health was proposed under major subproblems one and two, i.e.:

1. What was the effect of selected variables on ill missionary lost time and other dependent quantities?
2. What social and emotional health factors as reported by mission presidents were related to missionary health?

Before an inferential statistical analysis on these two subproblems is given, a descriptive analysis will be provided.

### Univariate Analysis

Both ill and well missionaries responded to survey questions regarding their age, sex, mission area, homeland, months in the mission field, population of city currently laboring in, monthly mission cost, living conditions, diet, pre-existing health conditions, energy levels, health prevention advice, and adequacy of medical care within mission area. In addition, ill missionaries were asked to report the diagnosis of their condition, the duration of their illness or injury, whether or not they had experienced their condition previously on their mission, the number of lost proselyting hours accumulated due to health problems, and the amount of medical costs incurred while recuperating.

Responses to these questions were not normally distributed because of extreme values obtained from certain individuals and because of the unique population surveyed. Consequently, the most sensitive measure of central tendency was often the median as it was not affected by extreme scores. The mean and mode were also provided, however, for a more complete analysis.

With that background information noted, a univariate summary of the responses received from the surveys follows.

#### Age

Table 4 illustrates the age breakdown of ill and well missionaries and can be seen on the next page.

Table 4 shows there were three hundred and eighty-five ill missionaries who ranged between 18 and 73 years of age, the

Table 4

Frequency Distribution of Ill and Well Missionaries by Age  
Dec. 1979 - March 1980

Age	Health Status								
	Ill	%	Cum. F.	Well	%	Cum. F.	Comb.	%	Cum. F.
18	1	.3	.3	2	1.1	1.1	3	.5	.5
19	96	24.9	25.2	39	21.2	22.3	135	23.7	24.3
20	119	30.9	56.1	53	28.8	51.1	172	30.2	54.5
21	71	18.4	74.5	37	20.1	71.2	108	19.0	73.5
22	33	8.6	83.1	10	5.4	76.6	43	7.6	81.0
23	21	5.5	88.6	16	8.7	85.3	37	6.5	87.5
24	11	2.9	91.4	6	3.3	88.6	17	3.0	90.5
25-34	19	5.0	96.4	13	7.1	95.7	32	5.6	96.1
35-44	2	.5	96.9	.	.	95.7	2	.4	96.5
45-54	.	.	96.9	.	.	95.7	.	.	96.5
55-64	8	2.1	99.0	2	1.1	96.7	10	1.7	98.2
65-74	4	.	100.0	4	2.2	98.9	8	1.4	99.6
75-84	.	.	100.0	1	.6	99.5	1	.2	99.8
85+	.	.	100.0	1	.5	100.0	1	.2	100.0
Total	385	100.0	100.0	184	100.0	100.0	569	100.0	100.0

majority falling between 19 and 23. The calculated median and mode were both 20 years while the mean was 22 years. There were one hundred and eighty-four well missionaries who spanned from 18 to 86 years.

### Sex

Table 5 presents the percentage of male and female missionaries in the project sample. Eighty-three percent or 320 of the ill missionaries and 85% or 155 of the well missionaries were male. In contrast, 65 ill females composed 17% of the ill missionaries compared to 28 well females who determined 15% of the well sample.

Table 5

Frequency Distribution of Ill and  
Well Missionaries by Sex  
Dec. 1979 - March 1980

Sex	Health Status					
	Ill	%	Well	%	Comb.	%
Male	320	83.1	155	84.7	475	83.6
Female	65	16.9	28	15.3	93	16.4
Total	385	100.0	183	100.0	568	100.0

### Mission Reports

Table 6 demonstrates the percentage of survey reports received by mission while Tables 7 and 8 illustrate injury or illness attack rates by mission. Specifically, table 7's attack rates were calculated using only premier initial while table 8's attack rates were computed using all initial and subsequent reports.

When the seven surveyed missions were ranked in order of the number of ill reports received from the mission field, the following list resulted: England, London East; California, Fresno; Japan, Tokyo South; Philippines, Davao; New Zealand, Wellington; Bolivia, La Paz; Mexico, Mexico City North. This relative mission ranking remained the same even when all initial and subsequent reports were taken into account. Nevertheless, the mission order changed slightly when attack rates and percentages were figured. England continued in first place, but New Zealand came in second and was followed closely by the Philippines. California was fourth and Japan was fifth, only six points away from England. Bolivia and Mexico remained at the bottom of the ranking--in that respective order. When attack rates were further broken down by sex, England was first in both the male (41.8%) and female (53.9%) category. The sequence of missions for male attack rates then proceeded as follows: Japan, New Zealand, Philippines, California, Mexico, and Bolivia. The mission ranking for female attack rates descended in the following manner: England, New Zealand, Philippines, California, Bolivia, Japan, and Mexico.

Table 6

Frequency Distribution of Ill and Well  
Missionary by Mission  
Dec. 1979 - March 1980

MSN	Health Status by Percent					
	Ill	%	Well	%	Both	%
California	78	20.26	25	13.6	102	18.0
Philippines	56	14.55	25	13.6	81	14.3
Japan	71	18.44	30	16.3	101	17.8
Mexico	20	5.19	24	13.0	44	7.7
England	80	20.78	28	15.2	108	19.0
Bolivia	25	6.49	28	15.2	53	9.3
New Zealand	55	14.29	24	13.0	79	13.9
Total	385	100.00	184	100.0	568	100.0

Table 7

Attack Rates (Per 100) of Missionary Injury/Illness  
by Mission Using Premier Initial Reports  
Dec. 1979 - March 1980

	Number of Ill Missionary Reports	Population Within Mission	Attack Rate x 100
California	78	209	37.32
Philippines	56	145	38.62
Japan	71	193	36.79
Mexico	20	145	13.79
England	80	184	43.48
Bolivia	25	143	17.48
New Zealand	55	138	39.86
Total	385	1,157	33.28

Table 8

Attack Rates (Per 100) of Missionary Illness/Injury  
Per Mission Using all Initial and Subsequent  
Reports from Ill Missionaries  
Dec. 1979 - March 1980

MSN	Number of Ill Missionary Observations	Population Within Mission	Attack Rate x 100
California	133	209	63.6
Philippines	97	145	66.9
Japan	111	193	57.5
Mexico	30	145	20.7
England	159	184	86.4
Bolivia	50	143	35.0
New Zealand	73	138	52.9
Total	653	1,157	56.44

If the overall ranking of missions was contrasted with the national health pictures of the various countries where the missions resided, a surprising discrepancy results. Statistically, the lesser developed countries (LDCs) such as Bolivia, Mexico, and the Philippines pose much greater health threats to their native populations and thus to visitors than developed countries like England, New Zealand, Japan, and the United States. This discrepancy may be partly explained by the possibility that compliance with the survey program was followed more closely in the developed countries. Although this is just an assumption, it seems absolutely improbable that missionaries in developed countries have more illness than those in less developed nations.

Homeland

Table 9 depicts percentage figures showing the proportion of ill and well missionary reports received from missionaries who served their mission in their homeland versus those missionaries who served in areas other than their homeland.

As can be seen in table 9, 27% of the ill missionaries served their missions within their native homeland while 72.7% labored in mission fields other than their native countries. In contrast, the majority (66.3%) of well missionaries reported serving in their homeland while 33.7% of the well sample reported laboring in non-native areas.

Table 9

Frequency Distribution of Ill and Well Missionaries  
by Birth Status--Native vs. Non-Native

Dec. 1979 - March 1980

Birth Status	Health Status					
	Ill	%	Well	%	Comb.	%
Native	105	27.3	122	66.3	227	39.9
Non-native	280	72.7	62	33.7	342	60.1
Total	385	100.0	184	100.0	569	100.0



### Months in Field

Table 10 on page 47 shows the percentage breakdown of the number of months ill and well missionaries had served in the field at the time they sent in their research questionnaires. Of the ill missionaries, 35.3% reported 0-6 months experience in the mission field and the percentage of ill missionaries who reported 7-12, 13-18, and 19-23 months decreased systematically from 27.3% to 25.7% to 11.7%. Such a trend was predictable in light of the 1975 missionary study conducted by LDS Welfare Services. This study found that most missionary disruption occurred within the first nine months of missionary experience. (39) Well missionary reports were fairly evenly divided among the four categories of mission experience, i.e., 0-6, 7-12, 13-18, 19-23, as the computed percentages for these periods were 25.5%, 26.1%, 26.1% and 22.3% respectively.

### Population of City When Laboring

The information organized in Table 11 presents the city population of where ill and well missionaries were serving at the time they sent in their reports.

Ill and well missionaries labored in villages and cities ranging from 2,000 to 20,000,000. Most missionaries, however, worked in areas of 75,000 or less (50.1%). The median population for the ill missionaries within a range from 2,000 to 15,000,000 was 80,000 while the mode was 200,000. Well missionaries reported a median population of 65,000 and a mode of 100,000 within a span from

Table 10

Frequency Distribution of Ill and Well Missionaries  
by Number of Months in the Mission Field  
Dec. 1979 - March 1980

Number of Months in Mission Field	Ill	%	Cum. F.	Well	%	Cum. F.	Comb.	%	Cum. F.
0-6	136	35.3	35.3	47	25.5	25.5	183	32.2	32.2
7-12	105	27.3	62.6	48	26.1	51.6	153	26.9	59.1
13-18	99	25.7	88.3	48	26.1	77.7	147	25.8	84.9
19-23	45	11.7	100.0	41	22.3	100.0	86	15.1	100.0
Total	385	100.0	100.0	184	100.0	100.0	569	100.0	100.0

Table 11

Frequency Distribution of Ill and Well Missionaries  
by Population of Laboring Cities  
Dec. 1979 - March 1980

Population	Ill			Well		
	Ct.	%	Cum.F.	Ct.	%	Cum.F.
0-10,000	42	14.1	14.1	20	15.5	15.5
10,001-30,000	52	17.4	31.5	24	18.6	34.1
30,001-70,000	44	14.8	46.3	24	18.6	52.7
70,001-120,000	44	14.8	61.1	16	12.4	65.1
120,001-200,000	43	14.4	75.5	27	20.9	86.0
200,001-1,000,000	48	16.1	91.6	9	7.0	93.0
1,000,001-20,000,000	25	8.4	100.0	9	7.0	100.0
Total	298	100.0	100.0	129	100.0	100.0

2,000 to 20,000,000. On the average, ill missionaries tended to work in lesser populated areas.

#### Monthly Mission Costs

Table 12 on page 49 summarizes data received from ill and well missionaries concerning the amount of money they spent in one month on living expenses.

Ill missionary monthly estimated costs ranged from approximately \$125 to \$500. The mode and median were both \$200 and the mean was \$199. Overall, 95% of the ill sample spent no more than \$250 per month. Well missionary monthly cost estimates were somewhat similar to the estimated costs of ill missionaries. The mean was \$202; the median was \$190; and the mode was \$150. Ninety-five percent of the well missionaries spent \$300 or less monthly.

Table 12

Frequency Distribution of Ill and Well Missionaries  
by Monthly Cost of Mission  
Dec. 1979 - March 1980

Monthly Cost of Mission	Health Status								
	Ill	%	Cum. F.	Well	%	Cum. F.	Comb.	%	Cum. F.
0-100	1	.3	.3	6	3.4	3.4	7	1.3	1.3
101-200	211	58.8	59.1	95	54.3	57.7	306	57.3	58.6
201-300	141	39.2	98.3	67	38.3	96.0	208	41.0	98.3
301-400	4	1.1	99.7	3	1.7	97.7	7	.6	98.9
401-500+	2	.6	100.0	4	2.3	100.0	6	1.1	100.0
Total	359	100.0	100.0	175	100.0	100.0	534	100.0	100.0

The range for the well missionaries fell between \$88 and \$634. It was suspected that four well missionary monthly cost reports extending from \$475 to \$634 were estimates for missionary couples--not for single elders or sisters. Missionary couples were not supposed to file joint reports, but may have done so in these instances.

### Diet

Unfortunately, much of the data gleaned from the diet question (i.e., "Over a three day period, how many times (average) do you eat from each of the foods listed below?" Meat, milk, fruits, vegetables, cereals and grains) was suspect as it appeared after reviewing individual reports that many of the missionaries responded to the question by estimating food intake for only one day. Consequently, these 24-hour responses biased the whole sample and therefore any interpretation based on this dietary data is disputable. Tables 13, 14, 15, 16, and 17 on pages 51-53 demonstrate data breakdown on the number of servings ill and well missionaries ate of the milk, meat, fruit, vegetable, and cereal food groups respectively.

### Milk

From an overall view, ill missionaries consumed milk products once a day, as the reported median, mode, and mean over a three-day period was 3, 3, and 3.4 respectively. Well missionaries related similar averages for milk products, i.e., 3.37 for the mean, 3 for the median, and 3 for the mode. The relatively low number of servings for a three-day period is partially accounted for because

Table 13

Frequency Distribution of Ill and Well Missionaries  
by the Number of Times they Ate Milk Products  
during a Three-Day Period  
Dec. 1979 - March 1980

Milk Serving	Health Status					
	Ill			Well		
	Ct.	%	Cum.F.	Ct.	%	Cum.F.
0-1	73	20.4	20.4	38	22.2	22.2
2-3	167	47.2	67.6	81	47.4	69.6
4-5	34	9.2	76.8	18	10.5	80.1
6-7	60	16.8	93.6	24	14.1	94.2
8-10	23	6.4	100.0	10	5.8	100.0
Total	357	100.0	100.0	171	100.0	100.0

Table 14

Frequency Distribution of Ill and Well Missionaries  
by the Number of Times they Ate from the Meat  
Group during a Three-Day Period  
Dec. 1979 - March 1980

Meat Serving	Health Status					
	Ill			Well		
	Ct.	%	Cum.F.	Ct.	%	Cum.F.
0-1	91	24.5	24.5	51	28.8	28.8
2-3	192	51.8	76.3	81	45.8	74.6
4-5	54	14.5	90.8	26	14.7	89.3
6-7	30	8.1	98.9	19	10.7	100.0
8-9	4	1.1	100.0	0	.	.
Total	371	100.0	100.0	177	100.0	100.0

Table 15

Frequency Distribution of Ill and Well Missionaries  
by the Number of Times They Ate Fruit during  
a Three-Day Period  
Dec. 1979 - March 1980

Fruit Serving	Ill			Well		
	Ct.	%	Cum.F.	Ct.	%	Cum.F.
0-2	156	66.8	66.8	58	33.9	33.9
3-4	107	5.3	72.1	73	42.7	76.6
5-6	65	17.8	89.9	26	15.2	91.8
7-8	16	4.3	94.2	6	3.5	95.3
9-10	15	4.2	98.4	8	4.7	100.0
11-12	6	1.6	100.0	.	.	.
Total	365	100.0	100.0	177	100.0	100.0

Table 16

Frequency Distribution of Ill and Well Missionaries  
by the Number of Times they Ate Vegetables  
during a Three-Day Period  
Dec. 1979 - March 1980

Vegetable Serving	Ill			Well		
	Ct.	%	Cum.F.	Ct.	%	Cum.F.
0-2	142	38.2	38.2	69	39.2	39.2
3-4	163	43.8	82.0	66	37.5	76.7
5-7	49	13.2	95.2	34	19.3	96.0
7-8	10	2.6	97.8	7	4.0	100.0
9-10	6	1.6	99.5	.	.	.
11-12	2	.5	100.0	.	.	.
Total	372	100.0	100.0	176	100.0	100.0

Table 17

Frequency Distribution of Ill and Well Missionaries  
by the Number of Times they Ate Cereals and  
Grains during a Three-Day Period  
Dec. 1979 - March 1980

Cereals and Grains Servings	Ill			Well		
	Ct.	%	C.F.	Ct.	%	C.F.
0-1	43	11.9	11.9	19	10.9	10.9
2-3	156	43.4	55.3	76	43.4	54.3
4-5	49	25.5	68.9	26	14.8	69.1
6-7	74	17.8	86.7	33	18.9	88.0
8-10	38	13.3	100.0	21	12.0	100.0
Total	360	100.0	100.0	175	100.0	100.0

of a lack of availability of milk products in some of the surveyed countries.

#### Meat

Meat servings for ill missionaries during a three-day period ranged from 0-9 portions. The mean, median, and mode were 2.8, 3, and 3 respectively. Well missionaries ranged from 0-7 servings during three days and their reported mean, median, and mode was 2.7, 2, and 3.

#### Fruit

Ill missionary reports on fruit serving were similar to the milk and meat groups. Once again, the median and mode were 3



although the mean was 3.5. Well missionary estimates appeared slightly lower than the ill measurements, as their mean was 3.2, the median was 3 and their mode was 1.

### Vegetables

Ill missionaries reported eating an average of three servings of vegetables over a three-day period. Specifically, their mean was 3.14, their median was 3, and their mode was 3. Eighty percent of the ill missionaries ate vegetables between 2-3 times during the specified three-day time limit. Well missionary averages appeared close to their counterpart as their mean was 3.16, their median was 3, and their mode was 1.

### Breads and Cereals

The mean for the ill missionaries was 4.08 servings while the median and mode were both 3. The range spanned between 0-9 portions with the majority (53.6%) falling between 1-3. Well missionaries ranged between 0-10 with most (52.6%) falling between 1-3. Their mean, median, and mode was 4.15, 3, and 3 respectively.

Without exception both well and ill missionaries reported eating fewer portions than recommended in all the food groups. If the missionaries had followed rigidly the 2-2-4-4 basic food group formula, then they should have averaged 6-6-12 (combining fruits and vegetables) 12 for three days. Obviously, the nutritional intake of these sampled missionaries was lacking if indeed the data received is depicting an accurate diet picture--which is highly doubtful.

### Obstacles to Proper Diet

In addition to the question on food servings, the research survey asked missionaries what obstacles they encountered in maintaining a balanced diet. Table 18 summarizes the responses received from this question on page 56.

As shown before in tabular format both ill and well missionaries (approximately 40% of each group) listed cost as the key obstacle to eating balanced meals. Cost was followed by time constraints (approximately 28%) as the next greatest obstacle. Lack of availability of certain foods came in third with about 14% of the vote. Preparation factors (approximately 11%) followed lack of availability and a catch-all category labeled "other" accounted for about 7% of the remaining responses in each group.

### Diagnoses of Ill Missionary Health Conditions

Figure 1 portrays the proportional amount of ill missionary health conditions by diagnosis. There were 369 premier initial reports received which had responses to Question 6. Question 6 asked the ill missionaries to specifically describe the nature of their health conditions. These health conditions were then classified into one of the following eight categories:

1. Respiratory
2. Gastro-intestinal
3. Uro-Genital
4. Orthopedic
5. Emotional

Table 18

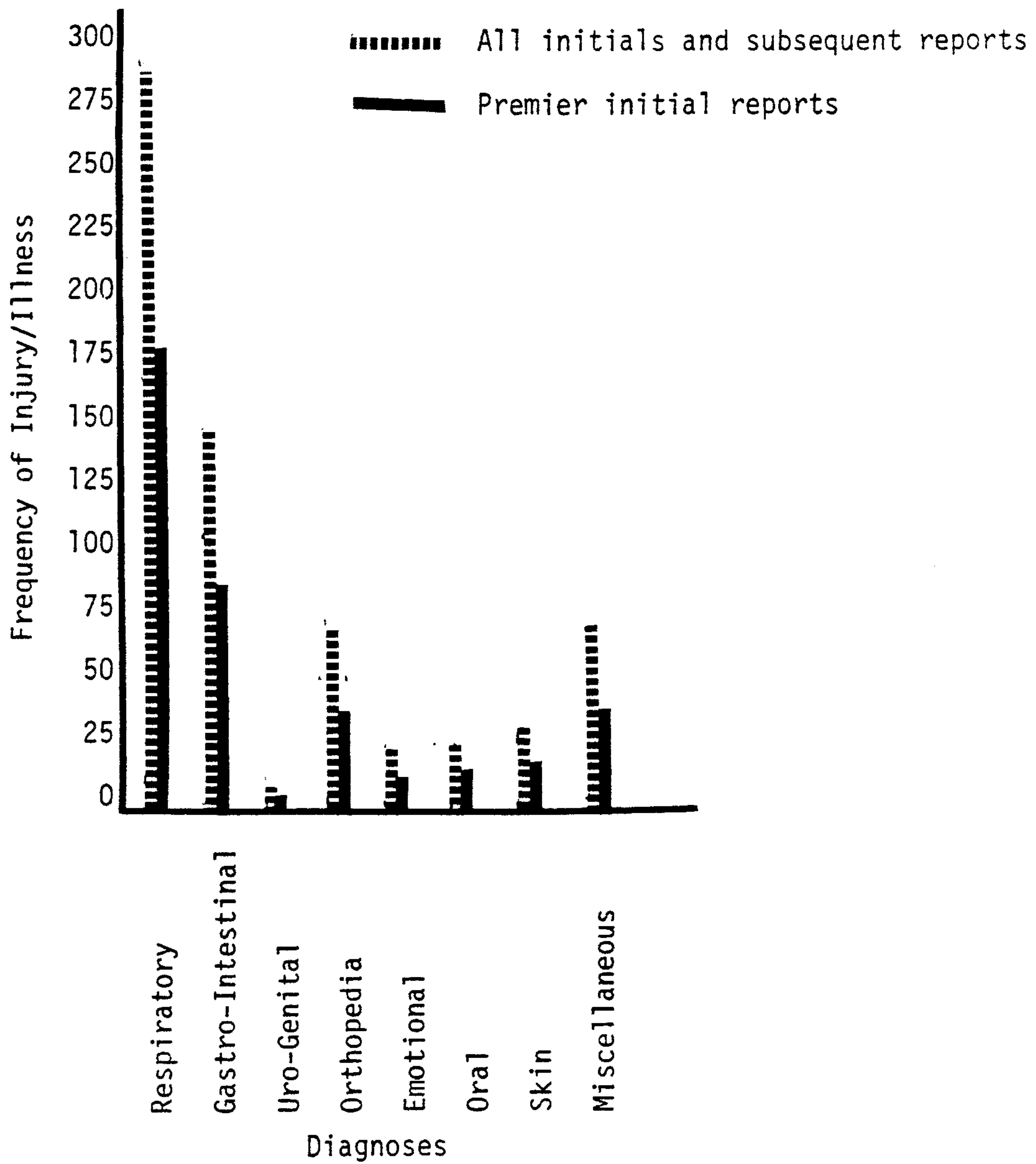
Frequency Distribution of Ill and Well Missionaries  
by Obstacles to Eating Balanced Meals  
Dec. 1979 - March 1980

Obstacles	Ill			Well			Both		
	Ct.	%	Cum.F.	Ct.	%	Cum.F.	Ct.	%	Cum.F.
Cost	147	39.2	39.2	77	42.5	42.5	224	40.3	40.3
Time	107	28.5	67.7	51	28.2	70.7	158	28.4	68.7
Availability	48	12.8	80.5	29	16.0	86.7	77	13.8	82.6
Preparation	47	12.5	93.1	12	6.6	93.4	59	10.6	93.2
Other	26	6.9	100.0	12	6.6	100.0	38	6.8	100.0
Total	375	100.0	100.0	181	100.0	100.0	556	100.0	100.0

Figure 1

FREQUENCY DISTRIBUTION OF ILL MISSIONARIES  
 BY DIAGNOSIS FOR PREMIER INITIALS  
 AND ALL INITIALS AND  
 SUBSEQUENT REPORTS

December 1979 - March 1980



6. Oral
7. Skin
8. Miscellaneous

Respiratory conditions led the list of health problems as 47.7% of the missionaries suffered from some sort of respiratory ailment. Next in count were gastro-intestinal problems (21.7%) and they were followed by orthopedic injuries (9.2%). Eight and nine-tenths percent of the missionary health conditions fell into the "other" category, while 4.1% of the conditions were skin disorders. Skin disorders were followed by oral and emotional problems. Urogenital disorders came in last with 1.1%.

#### Duration of Illness

Table 19 shows the duration of illness or injury experienced by missionaries as a result of their health conditions. Data used to calculate the average duration of missionary illness came only from missionaries whose illness was completed by the time they turned in their premier initial report. Those individuals whose illness lasted longer than one week and thus who had not recovered from their illness/injury, were asked to give the date the illness/injury developed. Efforts were not made to trace how long the unrecovered missionaries took to regain their health.

Two hundred eighty-two premier initial reports from ill missionaries evidenced that 54.6% of these individuals were well within three days; 85.1% were well within seven days, and 93.3% were

Table 19

Frequency Distribution of Ill Missionaries  
by Total Days Duration of Illness  
Dec. 1979 - March 1980

Days	Ct.	%	C.F.
0-1	66	23.4	23.4
2-3	88	31.2	54.6
4-7	86	30.5	85.1
8-14	23	8.2	93.3
15-21	8	2.8	96.1
22-99	11	3.9	100.0
Total	282	100.0	100.0

well within two weeks. The mean for this variable was 6.3 days while the median and mode were 3 and 2 respectively.

If all initial and subsequent reports were taken into account for the missionaries who responded to Question 6 in days only, excluding unrecovered illness and hour responses, then the mean for 432 responses was 7.18 days. Both the median (3 days) and the mode (2 days) were the same figures found in the premier initial analysis. The measures of central tendency were computed from range extremes of 0 and 99.

While it would not be statistically pure to compare averages computed from premier initials utilizing both days and hours against all initial and subsequent reports which computed averages utilizing only days, unmistakable similarities in the mean, median, and mode did appear. Thus, it may be that the premier initial reports were valid indicators of duration of illness.

### Pre-existing Conditions

Figure 2 depicts ill missionaries pre-existing conditions by medical classification. While not clearly shown from the figure, there were 381 out of 385 will missionaries who reported their injury/illness was not a result of conditions which existed before their mission. Strangely, however, 47 missionaries specified what the nature of their pre-existing injury/illness was.

Of the 47 reported conditions, 12 were classified as respiratory ailments. Four were categorized as gastro-intestinal problems, 1 was termed a uro-genital condition, 7 were listed under orthopedic injuries, 3 were oral problems, 1 was itemized as a skin condition, and 19 were so unique that they did not fall into any major category.

Well missionaries were also asked a question regarding pre-existing conditions, i.e., whether there were any illnesses or injuries they experienced prior to their mission that bothered them since being in the mission field. Of the 184 responses, 143 (77.7%) answered negatively and 41 (22.3) replied positively. Unfortunately, specific descriptions of these pre-existing illnesses were not analyzed.

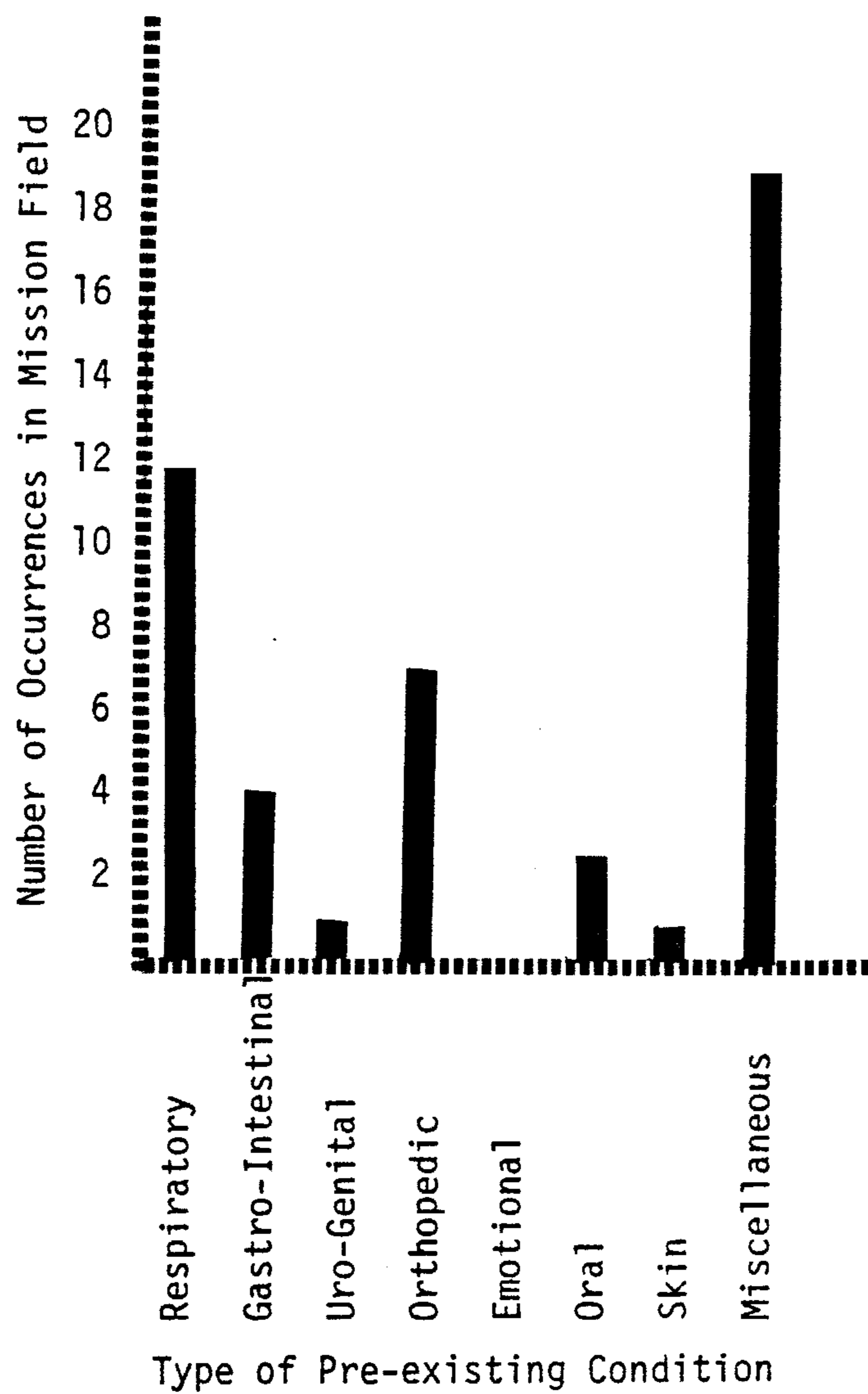
### Previous Episode

In close correlation to Question 8 regarding pre-existing conditions was Question 9 concerning previous episodes of illness/injury. A pre-existing illness or injury was classified as such if the missionary had experienced his health condition as a result of

Figure 2

FREQUENCY DISTRIBUTION OF ILL MISSIONARIES  
BY PRE-EXISTING CONDITION

December 1979 - March 1980





a situation which existed before his mission. A previous episode referred to a health condition which had occurred previously on his mission.

Of the 380 missionaries who responded to Question 9 on their premier initial reports, 201 (52.9%) reported they had experienced at least one episode previously on their mission. One hundred seventy-nine or 47.1% responded that their illness/injury was not preceded by a previous episode.

#### Lost Proselyting Time

In addition to requesting information from missionaries regarding the duration of their health conditions, the survey also asked missionaries to estimate the number of lost proselyting hours accumulated during their illness/injury. Tabular responses to the questionnaire's 10aa query on ill missionary lost proselyting time is found in table 20 on page 63.

As seen in table 20 115 or 30.7% of the 375 ill missionaries who answered Question 10aa reported no loss of proselyting time while ill or injured. Nevertheless, 249 premier initial forms which did report lost proselyting time evidenced a mean for this variable to be 15.14 hours; a median, 10 hours; and a mode, 10 hours. Eighty percent of these missionaries reported losing 24 hours or less, although the range extended from 0 to 83 hours.

If one took into account all initial and subsequent reports received for this variable, then 426 observations were obtained. All three measures of central tendency were similar to the premier

Table 20

Frequency Distribution of Ill Missionaries by Estimated  
Hours of Lost Proselyting Time Due to Illness  
or Injury  
Dec. 1979 - March 1980

Hours Lost	Missionaries' Lost Time			Companions' Lost Time			Missionaries' and Companions' Total Lost Time		
	Ct.	%	Cum. F.	Ct.	%	Cum. F.	Ct.	%	Cum. F.
0-12	165	66.3	66.3	184	76.7	76.7	114	45.4	45.4
13-24	36	14.3	80.7	29	12.0	88.7	66	26.3	71.7
25-48	34	13.7	94.4	20	9.4	97.1	31	12.4	84.1
49-72	13	2.2	99.6	7	3.9	100.0	22	9.1	93.2
73-144	1	.4	100.0	.	.	100.0	18	6.8	100.0
Total	249	100.0	100.0	240	100.0	100.0	251	100.0	100.0

initials, i.e., the mean was 15.43 hours while the median was 10 hours and the mode was 10 hours.

Another portion of Question 10 asked ill missionaries to estimate how many hours of lost proselyting time their companions experienced while they were sick. Two hundred forty-nine premier initial responses were received in answer to this question. Overall, companions lost less proselyting time than the actual sick or injured missionary. The mean for this variable was computed to be 10.47 hours while the median was 6 hours and the mode was 0. The range extended from 0-72 hours.

When these results were compared to tabulated findings acquired from all initial and subsequent reports, similar outcomes were obtained. The range spanned from 0 to 76 hours with a mean, median, and mode of 10.59 hours, 6 hours, and 0 hours respectively. Ninety percent of the companions were estimated to have not lost more than 25 proselyting hours because of ill/injured missionaries.

Total lost proselyting hours were tallied for all premier initial reports by adding the injured/ill missionaries' lost hours with the companions' lost hours. In all, 6,281 hours of proselyting time was lost by missionaries due to illness/injury. The median for this variable was 15 hours, although the mean was 25.02 hours.

If total proselyting hours lost from all initial and subsequent reports were taken into account, then 10,800 hours were reported lost over a four-month period. If, in turn these hours were divided by the total number of missionaries from all missions, the average missionary lost 9.3 proselyting hours during the four-month research period attributable to illness or injury.

### Energy Levels

Both ill and well missionaries were asked to respond to Question 11a and 11b regarding energy levels. Question 11b was worded the same way on both survey sheets, i.e., "On a scale from one to seven, what is your present energy performance level?" Question 11a, however, did not ask the same question on the two surveys since the wording was changed to fit the health condition of the missionary. Specifically, on the ill survey, 11a asked, "How do you feel your health allowed you to perform your proselyting activities (excluding study time) during the period of your illness?" Question 11a on the well missionary form asked "How do you feel your health has allowed you to perform proselyting activities (excluding study time) during the last four months?" Simply put, Question 11a on the ill survey was concerned solely with energy levels during illness/injury, while on the well survey it focused attention on energy levels during a four-month period. Table 21 illustrates the energy level data obtained from question 11a.

Three hundred seventy-one ill missionary responses to Question 11a were computed into a mean of 3.35, a median of 3, and a mode of 2. While a majority of ill missionaries reported low energy levels, a surprising 42.3% rated their energy levels to be four or above--even while ill.

These high ratings might have been partly the result of missionaries' overanxious desires to please their mission presidents whom they might have felt would see their reports. Another explanation for some of the high ratings might have been respondents'

Table 21  
 Frequency Distribution of Ill Missionaries  
 by Energy Level  
 Dec. 1979 - March 1980

Energy Level	During Illness			Presently		
	Ct.	%	C.F.	Ct.	%	C.F.
1	74	19.9	19.9	11	3.0	3.0
2	79	21.3	41.2	15	4.1	7.0
3	61	16.4	57.7	26	7.0	14.1
4	40	10.8	68.5	35	9.5	23.6
5	49	13.2	81.7	68	18.4	42.0
6	42	11.3	93.0	117	31.7	73.7
7	26	7.0	100.0	97	26.3	26.3
Total	371	100.0	100.0	369	100.0	100.0

unrealistic ideas of missionary duty, i.e., "even when ill or injured, a good missionary will have enough energy to perform his labors uncomplainingly and successfully." By marking a four or above, his energy level would have been considered sufficient to successfully perform all duties. Question 11b, as previously explained referred to ill missionary perceptions of their present level of energy. The mean for the ill missionaries was 5.37, while the median and mode were 6. In total, 58% of the ill missionaries reported energy levels of 6 or 7.

Tabular energy levels of well missionaries are shown in table 22. Well missionary energy level ratings in response to 11a were generally higher than the ill missionaries. The median and mode were both 6 while the mean was 5.56. Sixty-two and six tenths percent described their energy levels as either a 6 or 7 over a

Table 22

Frequency Distribution of Well Missionaries  
by Past and Present Energy Levels  
Dec. 1979 - March 1980

Energy Level	Past (During the Four-Month Period)			Present		
	Ct.	%	C.F.	Ct.	%	C.F.
1	2	1.1	1.1	3	1.7	1.7
2	1	0.5	0.5	3	1.7	3.3
3	12	6.7	7.8	5	2.8	6.1
4	21	11.7	19.6	13	13.0	13.3
5	32	17.9	37.4	33	18.3	31.7
6	70	39.1	96.5	72	40.0	71.7
7	42	23.5	100.0	51	28.3	100.0
Total	179	100.0	100.0	180	100.0	100.0

four-month time period. Only 7.8% described their energy level as a 1, 2, or 3. Normally on a rating scale people tend to mark the middle numbers but apparently missionaries whether well or ill tend to rate themselves in the upper extremes.

Present energy levels for well missionaries were closely comparable to ill missionaries' present energy ratings. The well missionary mean for this variable was 5.37. Both the median and mode were slightly higher at 6.

#### Adequacy of Medical Care

On a scale from 1 (inadequate) to 7 (adequate), ill and well missionaries were asked to judge the quality of medical care within their missions. At the outset, however it must be explained that the ill survey form and well survey form did not ask missionaries the

same exact question in regard to adequacy of medical care. Ill missionaries were asked to judge on a scale of one to seven how well they judged the quality of medical care they received. Many ill missionaries did not, however, receive any medical care and thus if they answered the question could only respond on the basis of subjective estimation. Well missionaries also did not receive any medical treatment, so they were asked how adequately they judged the quality of medical care available in their area. Both questions, while worded slightly differently focused on the same general topic, i.e., how adequate were mission area medical facilities? Because the questions were so closely connected, it was felt that the responses received from both groups could be contrasted against each other. With that explanation given, a summary of the data results follow in table 23 on page 69.

The table shows 231 ill missionary responses on adequacy of medical care were averaged and the following results were obtained: Mean = 5.22; median = 6, and mode = 7. In contrast, 180 well missionaries reported an overall mean of 4.63, a median of 5, and a mode of 5 for the same variable.

#### Comparison of Living Conditions

Question 2 on both surveys asked missionaries to indicate on a scale from 1 (much worse) to 7 (much better) how living conditions in their current field of labor compared with those they experienced at home before their mission. Both missionary groups generally agreed that conditions in the mission field were worse than at home

Table 23

Frequency Distribution of Ill and Well Missionaries by Subjective  
Judgment on Adequacy of Medical Care within Mission Field  
Dec. 1979 - March 1980

Adequacy of Medical Care	Health Status								
	Ill			Well			Both		
	Ct.	%	C.F.	Ct.	%	C.F.	Ct.	%	C.F.
1	6	2.6	2.6	12	6.8	6.8	18	4.4	4.4
2	11	4.8	7.4	15	8.5	15.3	26	6.4	10.8
3	22	9.5	16.9	23	13.1	28.4	45	11.1	21.9
4	35	15.2	32.0	24	13.6	42.4	59	14.5	36.4
5	37	16.0	48.1	37	21.0	63.1	74	18.2	54.5
6	54	23.4	71.4	28	15.9	79.0	82	20.1	74.7
7	66	28.6	100.0	37	21.0	100.0	103	25.3	100.0
Total	231	100.0	100.0	176	100.0	100.0	407	100.0	100.0



as can be seen on Table 24, page 71. Data shown in the frequency distribution on ill missionaries' comparison of living conditions was averaged and the mean was found to be 3.37 while the median and mode were both 3. Similarly, the overall averages for 177 well missionaries were almost identical to the ill missionary measures, i.e., the mean was 3.36, the median was 3, and the mode was 3.

#### Preventive Health Advice/Instruction

Question 13 on the ill survey and Question 9 on the well survey asked missionaries if they had received advice/instruction which specifically helped them avoid or prevent illness or injury.

For this particular question, ill missionary responses were tabulated from all initial reports. (Subsequent reports were not included.) By using all initial reports in the analysis, some bias was introduced into the results; however, it was surmised that during a four-month period preventive advice and instruction could have been given to missionaries more than once by more than one individual. Premier initial reports would have only reported on preventive advice given previous to the first injury/illness, while the use of all initial reports took into account a greater time frame and therefore additional preventive sources. Thus table 25 includes preventive advice data from all initial forms.

Two hundred sixty-six (52.9%) initial reports from ill missionaries indicated they had received preventive health advice from some source(s). However, 237 (47.1%) initial reports indicated no preventive health advice had been obtained. In contrast 128 (71.9%) of the well missionaries were given advice while 50 (28.1%)

Table 24

Frequency Distribution of Ill and Well Missionaries by Comparison  
of Living Conditions in Mission Field  
with Living Conditions at Home  
Dec. 1979 - March 1980

Living Conditions Rating	Health Status								
	Ill			Well			Both		
	Ct.	%	Cum. F.	Ct.	%	Cum. F.	Ct.	%	Cum. F.
1	27	7.1	7.1	20	11.1	11.1	47	8.4	8.4
2	68	18.0	25.1	28	15.6	26.7	96	17.2	25.6
3	114	30.2	55.3	53	29.4	56.1	167	29.9	55.6
4	108	28.6	83.9	41	22.8	78.9	149	26.7	82.3
5	37	9.8	93.7	25	13.9	92.8	62	11.1	93.4
6	17	4.5	98.1	11	6.1	98.9	28	5.0	98.4
7	7	1.9	100.0	2	1.1	100.0	9	1.6	100.0
Total	378	100.0	100.0	180	100.0	100.0	558	100.0	100.0

Table 25

Frequency Distribution of Ill and Well Missionaries  
by Advice Received on Prevention of Illness  
(Includes all Initial Reports)  
Dec. 1979 - March 1980

	Ill	Well	Both
Physician	106	53	159
Self	90	51	141
Mission President	73	55	128
Companion	65	24	89
Other (Miscellaneous)	58	46	104
MTC	41	35	76
Member	30	11	41
Nurse	23	10	33
Dentist	16	12	28
Pharmacist	6	6	12

were not. (Those ill and well missionaries who responded affirmatively to question 9 could mark one or more advice sources on the survey. Thus total figures from both groups were higher than actual number who responded.)

#### Days of Hospitalization

Table 26 illustrates the number of hospitalized days experienced by ill missionaries during a four-month period. In order to accurately calculate total days of hospitalization experienced by ill missionaries, all initial and subsequent reports were utilized. Hence, based on 651 initial and subsequent reports, 17 reported some form of hospitalization for a total of 49 days. The range extended from 0 (evidently five missionaries were hospitalized for less than one day) to 15 days. A mean was computed and found to be 2.8 days. The median and mode were both 1 day.

Table 26

Frequency Distribution of Ill Missionaries by Days  
Hospitalized (Includes all Initial and  
Subsequent Reports)  
Dec. 1979 - March 1980

Days	Ct.	%	C.F.
1	6	50.0	50.0
3	1	8.3	58.3
4	1	8.3	66.6
5	1	8.3	74.9
6	1	8.3	83.2
10	1	8.3	91.5
15	1	8.3	100.0
Total	12	100.0	100.0

#### Total Cost of Illness

Ill missionaries who spent money on hospitals medical practitioner bills, or medications, were asked to render an account of their expenditures in these areas. A univariate analysis was conducted on these expenditures using all initial and subsequent reports and the following results were reported:

#### Hospital Costs

Thirty-five missionaries reported spending a total of \$3,258.00 on hospital expenses. The total was especially high because of one California missionary who incurred hospital costs of \$1,800.00 (the range limit). Consequently, the mean expenditure was \$93.08 which did not accurately reflect the average amount spent

by missionaries on hospital bills. The median was \$10.00 as 54.3% spend \$10.00 or less on hospital expenses.

#### Medical Practitioner Costs

A total sum of \$4,827.00 was spent by 102 missionaries for practitioner services. The mean payment from a dollar range of \$0 to \$450.00 was \$47.32, although the median was computed to be \$10.00.

#### Medication Costs

One hundred sixty missionaries reported medication expenses ranging from 0 to 200 dollars. Total medication expenditures accumulated to \$1,657.00 for the group. Most medication purchases were not large, however, as the mean payment was only \$10.35 and the median was even less at \$5.00.

#### Total Costs

Total medical costs incurred by 204 missionaries spanned from \$0 to \$2,330.00. Fifty-nine percent of the missionaries spent a sum of \$10.00 or less. An additional 25% spent between \$11.00-50.00. Consequently, over 75% of the missionaries who reported paying medical expenses in actuality spent \$50.00 or less. The median expenditure for total medical costs was \$7.50. The mean of \$50.83 was much higher than the other averages because of extreme medical expenses incurred by a few missionaries in California. Table 27 resummaries this data in tabular form.

Table 27

Frequency Distribution of Ill Missionaries by Total  
Cost of Illness (Includes all Initial  
and Subsequent Reports)  
Dec. 1979 - March 1980

Amount of Dollars	Ct.	%	C.F.
0-10	120	58.8	58.8
11-50	50	24.5	83.3
51-100	11	5.4	88.7
101-500	21	10.3	99.0
500+	2	1.0	100.0
Total	204	100.0	100.0

General Linear Model Procedures:  
Subproblem I

After a univariate analysis was conducted on the foregoing data, two general linear models were devised in order to test for levels of significance between independent and dependent variables in hopes of satisfying the purpose of Subproblem I. The first model attempted to discover relationships between the independent variables of mission, health, sex and their interactions with the following dependent variables: age, nativity, months in field, laboring city population, monthly mission cost, living conditions, diet, pre-existing conditions, energy levels, and adequacy of medical care. These variables were substituted into the statistical formula individually and thus the effect of each dependent variable on the model was studied separately. This statistical model is written below in mathematical format:

$$\begin{aligned} \text{DEPENDENT VARIABLE} = & \text{Mu} + \text{Mission} + \text{Sex} + (\text{Mission} \times \text{Sex}) + \\ & \text{Health} + (\text{Mission} \times \text{Health}) + (\text{Sex} \times \text{Health}) + \\ & (\text{Mission} \times \text{Sex} \times \text{Health}) + \text{Error} \end{aligned}$$

Because of the nature of the overall studies, the analyzers were most interested in the relationship between health and the dependent variable. Consequently, while all levels of significance of .05 level will be reported in this thesis, tabled results and interpretations will only be attempted for relationships in which dependent variables significantly correlated with health and/or its interactions.

#### Age (568 Observations)

The first dependent variable studied in the model was age. Mission, sex, mission x sex, health, and mission x health were significantly related to age at .05.

Specifically, well missionaries were generally older than ill missionaries. The least squares mean for well missionaries was 26 years of age in contrast to 23.6 for ill missionaries. In further analysis, it was discovered that well missionaries from California, Philippines, Japan, Mexico, and New Zealand were older while ill missionaries from Bolivia and England were slightly older than their well counterparts. Table 28 details these results in numerical format.

#### Native (568 Observations)

Another dependent variable studied was whether nativity (nativity referred to being a native of the mission area) was

Table 28

Age Least Squares Means of Ill and Well  
Missionaries by Mission

Mission	Health Status	
	Ill	Well
California	30.03	42.55
Philippines	21.31	22.29
Japan	22.76	22.88
Mexico	21.11	23.10
England	23.31	21.50
Bolivia	25.99	22.42
New Zealand	21.35	27.29
Total	23.55	26.002

significantly related to health. In the model used, this relationship was not found to be significant. Nativity was significantly related to mission and sex, however, and those findings were probably a function of mission calls.

Months in Field (568 Observations)

Months in the field was significantly related to health at the .039 level. Table 29 below shows the calculated months in

Table 29

Months in Field Least Squares Means  
of Ill and Well Missionaries

Missionaries	Months in Field Means
Ill	9.26
Well	11.09



field mean for ill and well missionaries. As shown in this table, well missionaries had served longer than ill. Such a finding supports an unpublished report authored by Dr. Ferguson in 1975.

Monthly Cost of Mission  
(533 Observations)

All variables in the model were significantly related to monthly spending except sex. Of greatest interest to this analysis was the fact that health and mission x health were significantly correlated with spending at the .0001 level. Table 30 shows how health and its interaction relate to cost.

Well missionaries reported spending \$206.89 per month as opposed to ill missionaries, who spent \$188.26 per month. In a specific breakdown, well missionaries spent more than ill missionaries in every mission except Mexico. Additionally, both female

Table 30

Monthly Mission Cost Least Squares Means of Ill  
and Well Missionaries by Mission

Mission	Monthly Mission Cost Means	
	Ill	Well
California	222.38	317.95
Philippines	146.70	149.89
Japan	231.64	249.21
Mexico	151.15	125.58
England	215.70	257.93
Bolivia	146.10	149.48
New Zealand	171.22	198.21
Total	188.26	206.90

and male well missionaries spent significantly more than ill sample. And finally, female well missionaries spent more than female ill, male ill, and male well missionaries in all missions except Mexico. In Mexico, male ill missionaries reported spending more than either male well or female well missionaries--female ill missionaries did not report.

One possible interpretation of this data was that missionaries who spent more money on better food, better accommodations, and better clothing, did not get ill as often. The one exception to this hypothesis was Mexico. Obviously, in that country other factors were coming into play which are presently unaccounted for.

No other relationship was found to be significant to months in field except sex. Female missionaries, because they serve for only 18 months, had a significantly lower least squares mean than male missionaries who typically serve for two years.

#### Laboring City Population (426 Observations)

According to the model used, population of city was not significantly related to health. Mission and sex, however, were found to significantly correlate to population. These relationships are functions of mission areas and calls.

#### Comparison of Living Conditions in Mission Field to Home (557 Observations)

The only significant relationship in this model was between mission and the dependent variable. Neither health nor its inter-

actions were significantly related as to how missionaries viewed their present living conditions with living conditions experienced at home.

Just for interest's sake, missionaries in New Zealand viewed their mission as most closely comparable to their home situation. New Zealand was followed by Mexico, and then by Japan. California was ranked fifth and was followed by England. The Philippines and Bolivia ranked sixth and seventh respectively.

Adequacy of Medical Care  
(405 Observations)

Table 31 summarizes missionary views on the adequacy of medical care as health status was the only variable significantly related to adequacy of medical care.

Generally, ill missionaries judged the quality of their health care to be higher on the scale than well missionaries. Perhaps the ill missionaries' higher rating was a function of experience.

Table 31

Adequacy of Medical Care Least Squares  
Means by Ill and Well Missionaries

Missionaries	Adequacy of Medical Care Means
Ill	5.34
Well	4.67

## Diet

As previously reported, the data obtained on diet was suspect because it appeared that many missionaries reported food consumption for one-day only while others reported food intake for a three-day period. There was no accurate way of clearly delineating between missionaries who reported 24-hour recall and those who reported 72-hour recall, so data was studied on the assumption that servings were reported for three days.

Meat (496 Observations). The only significant relationship computed was between mission and meat. Missionaries laboring in the Philippines reported eating 3.78 servings of meat over a three-day period. Missionaries in Bolivia came in next with their reported 3.4 servings over three days. They were followed by missionaries serving in California who averaged 3.04 meat servings over 72 hours. The rest of the missions reported averages of under three servings for three days. Specifically, they were New Zealand (2.85), Mexico (2.56), Japan (2.17), and England (2.16).

Milk (496 Observations). Mission, mission x health interaction, and mission x sex x health interaction were all significantly related to milk intake. Specifically by mission, California missionaries reported consuming more milk products than the other missions surveyed. This mission was followed by New Zealand, Mexico, England, Japan, Bolivia, and the Philippines respectively.

Another area studied in the milk group serving analysis was the mission x health interaction. Unfortunately, there was no consistent pattern evident between mission x health

interaction and milk intake. Ill missionaries reported consuming more milk products in the Philippines, Mexico, England, Bolivia, and New Zealand. Well missionaries reported more milk product consumption in the U.S. and Japan. Table 32 demonstrates the lease squares means for the mission x sex x health interaction in correlation with milk group servings.

As seen in the table above, there was also no consistent diet pattern evident between mission x sex x health and milk intake; consequently, the three-way interaction was of very little value because health and diet conditions in the seven surveyed areas were so different.

Fruit (496 Observations). Mission, sex, health, and mission x health interaction were all significantly related to fruit consumption. Table 33 illustrates health and fruit relationship as well as the mission x health and fruit correlation. In concrete terms, this table is showing that missionaries serving in the Philippines reported eating more servings of fruit for a three-day period than any other group while missionaries in Bolivia reported eating the least amount. In addition ill missionaries typically ate more fruit than well.

Vegetables (496 Observations). Mission and sex were two variables which related significantly to vegetable intake. Health, however, was not significantly related to the vegetable intake.

Cereal and Grains (496 Observations). Mission and mission x sex interactions were significantly related to cereal and grains

Table 32

## Milk Group Least Squares Means of Ill and Well Missionaries by Mission and Sex

Mission	Milk Group Means			
	Ill		Well	
	Male	Female	Male	Female
California	4.76	3.73	5.11	8.00
Philippines	1.60	.80	.89	1.33
Japan	2.56	2.33	3.19	2.33
Mexico	4.07	6.00	3.42	3.00
England	3.87	4.42	3.55	4.00
Bolivia	2.44	1.43	1.68	3.60
New Zealand	4.58	4.86	4.52	3.67

Table 33

## Fruit Group Least Squares Means of Ill and Well Missionaries by Mission

Mission	Fruit Group Means	
	Ill	Well
California	3.42	4.92
Philippines	5.04	5.56
Japan	5.15	3.08
Mexico	4.93	2.38
England	3.46	2.92
Bolivia	2.67	2.72
New Zealand	4.35	3.07
Total	4.15	3.52

consumption. Once again, however, health was not found to be related to the dependent variable.

Another multivariate test utilized in this analysis on missionary diet was the Wilk's criterion. It was used to determine whether mission, sex, and health had an overall effect on food intake. From this matrix it was determined that there was a .0001 chance that mission had no overall effect on diet and a .044 chance that sex had no overall effect on food consumption. Health was not considered to be significant, however, as there was a .3030 chance that health had no overall effect on food intake. When health, nevertheless, interacted with mission, there was only a .0442 chance of no overall mission health effect. All other interactions, when tested with statistical matrices, were not significant.

#### Energy Levels (542 Observations)

Measurements from both ill and well missionaries regarding their present energy levels were obtained from the surveys and then plugged into the original general linear model mentioned previously.

No variables were significantly related to present energy levels at the .05 level.

Another model employed in the general linear models procedure of Subproblem I was based on analysis of co-variance. This statistical test was employed to determine certain variables plugged into the model had predictive value for missionary injury or illness. The dependent variables in this model consisted of ill missionary lost proselyting time, companion lost proselyting time, and combined lost proselyting time. These variables were

studied separately so only one dependent factor was found in the model at a time.

On the right side of the model equation, mission, sex, and their interaction were always included as independent variables. In addition, the following independent variables were substituted separately into the equation: hours of time lost, diagnosis, pre-existing condition, preventive instruction/advice, medication, nativity, age, months in field, laboring city population, monthly mission cost. This analysis of co-variance model is shown in mathematical format below.

$$\begin{aligned} \text{DEPENDENT VARIABLE} = & \text{Mu} + \text{Mission} + \text{Sex} + (\text{Mission} \times \text{Sex}) + \\ & \text{Added Independent Variable} + (\text{Mission} \times \\ & \text{Added Independent Variable}) + (\text{Sex} \times \text{Added} \\ & \text{Independent Variable}) + \text{Error} \end{aligned}$$

A description of the results which accrued from the use of this statistical formula follows.

Time Lost vs. Mission x Sex. Mission, sex, and their interaction were placed into the model alone without the addition of another independent variable to determine if any significant relationship existed between the independent variable and the three dependent variables. Ill missionary time lost was not significantly related to mission or sex or their interaction. Companion time lost and total time lost, however, were significantly related to the mission x sex interaction.



Table 34 displays the calculated least squares means for hours of total time lost by mission x sex. No apparent explanatory pattern was visible.

The  $R^2$  for the model incorporating total time lost as the dependent variable was computed to be .10. Thus, 10% of the variability of total time lost was explained by the independent variables and their interactions.

Time Lost vs. Diagnosis. The second models procedure employed in the analysis added reported diagnostic conditions as an independent variable. Ill missionary time lost was not found to be significantly related to anything but the mission x sex interaction. Nevertheless, both companion time lost and total time lost were significantly related to diagnosis, mission x sex, and sex x diagnosis interaction. In addition, companion time lost was also significantly correlated to mission, and mission x diagnosis interaction. The  $R^2$  for the total time lost model was .34.

Table 34

Least Squares Means of Total Time Lost  
By Mission x Sex Interaction

Mission	Missionary x Sex	
	Female	Male
California	10.50	4.94
Philippines	24.38	9.00
Japan	7.67	6.77
Mexico	2.00	13.64
England	10.00	12.58
Bolivia	6.13	18.29
New Zealand	16.50	10.68

Tabular results were not included in this portion of the analysis as least squares means of diagnosis and its interactions had no meaning since diagnosis was a categorical variable. Furthermore, the statistical analysis system did not estimate least squares means for companion time lost versus mission and for companion time lost and total time lost versus mission x sex interaction. This lack of data was due to missing cells. (While SAS is able to compute sum of squares with missing cells, it is not programmed to give least squares means if missing cells are present.)

Time Lost vs. Pre-existing Conditions. The next independent variable substituted into the model was whether or not ill missionaries reported their illness/injury to be a result of a pre-existing condition. Only 40 ill missionaries reported their health condition to have had a pre-existing history. Ill time lost was not found to be significantly related to any independent variables in the model. This also held true for companion time lost and total time lost. Not surprisingly, the  $R^2$  for the total time lost model was .52.

Time Lost vs. Preventive Advice/Instruction. Ill time lost, companion time lost, and total time lost were all significantly related to the mission x sex interaction when preventive advice was added into the model. Companion time lost, however, was only found to be significantly related to preventive advice. Table 35 reports this relationship in numerical format.

This table illustrates the point that when an ill missionary was disabled enough to cause his/her companion to lose proselyting time, usually the ill missionary had received some form of preventive advice. (Tables were not constructed to show the relationship

Table 35

## Least Squares Means of Companion Time Lost

	Companion Time Lost
No	7.00
Yes	12.95

between mission x sex interaction and the dependent variables because it was felt that the relationships were not as pertinent to the analysis as other correlations.) The  $R^2$  for the total time lost model was .17.

Time Lost vs. Medication. When medication was taken by ill missionaries for a health problem, it was found to be significantly related to all three variables. Additionally, mission x sex interaction was significantly correlated to ill time lost and companion time lost. The  $R^2$  for the total time lost model was .15. Tabular results between total time lost and medications taken are not given because of missing cells.

Time Lost vs. Nativity. When missionary nativity was added to the model, once again the mission x sex interaction was found to be significantly related to the three dependent variables. Nothing else was found to be significantly correlated. The  $R^2$  for the total time lost model was .14.

Time Lost vs. Age. Age was the next independent variable added to the model. Ill time lost was not significantly correlated with age or any other variable. Both companion time lost and total time lost, however, were significantly related to mission, and

mission x age. These relationships were probably a function of mission calls. The  $R^2$  for the total time lost model was .15.

Time Lost vs. Months in Field. The mission x sex interaction was the only significantly related variable to companion time lost and total time lost when months in field was added to the model. Ill time lost was not significantly related to any variable. The  $R^2$  for the total time lost model was .13.

Time Lost vs. Laboring City Population. When laboring city population was substituted to the model, no variables were found to be significantly related to the three dependent variables. The  $R^2$  for the total time lost model was .15.

Time Lost vs. Monthly Mission Cost. The last variable substituted into the model was cost. Ill time lost was not significantly related to cost or the other independent variables. Companion time lost and total time lost were, however, significantly related to mission x sex interaction and cost x sex interaction. Tabular format was not possible for the cost x sex interaction due to missing cells. The  $R^2$  for the total time lost was .11.

#### Chi-Square Test of Two Nominal Variables of Subproblem I

In addition to the two general linear procedures performed, a chi-square test was done to see if two categorical variables were related, i.e., sex and health. The results of this test indicated that sex and health were not significantly related in the mission field. It is suggested, however, that more research be done in this

area as only 28 well female missionaries and 68 ill female missionaries were compared to 155 well male missionaries and 320 ill male missionaries.

### Subproblem II

Subproblem II of this thesis asked the following question: What social and emotional factors as reported by mission presidents were related to missionary health? In order to answer that question, mission presidents who administered the seven surveyed missions were asked to rate each missionary within their respective missions who took part in the research program on four different areas. These areas included missionary effectiveness, emotional health, interpersonal relationships, and motivation and enthusiasm. (See Appendix.) The rating scale ranged from 1 to 4; 1 signified poor, 4 signified excellent. A univariate analysis on these scaled responses was conducted as well as a general linear models procedure. The results obtained are described below.

#### Effectiveness

Three hundred eighty-two individual ratings concerning ill missionaries' effectiveness were obtained from 7 mission presidents. These administrators judged 81% of the ill missionaries as either good (3) or excellent (4) on this factor. The mean, median, and mode for this variable was 3.17, 3, and 3. One hundred eighty-three well missionary ratings also averaged around 3 as that number was the reported median and mode. The mean was slightly higher at 3.23.

Table 36 illustrates the frequency distribution of this variable in tabular format.

A general linear model was developed based on the 565 observations received to determine whether health status was significantly related to missionary effectiveness. The model used is represented below.

$$\text{MISSIONARY EFFECTIVENESS} = \mu + \text{Mission} + \text{Health} + (\text{Mission} \times \text{Health}) + \text{Error}$$

The only variable which was correlated to effectiveness at the .05 level was mission. That finding implied mission presidents varied significantly in their overall judgment ratings.

### Emotional Health

Table 37 summarizes the responses received from mission presidents on missionary emotional health. As can be seen in the table, mission presidents gave the majority (77.5%) of 382 ill

Table 36

Frequency Distribution of Ill and Well Missionaries  
by Missionary Effectiveness Rating  
Dec. 1979 - March 1980

Missionary Effectiveness Rating	Missionary Health Status					
	Ill	%	Well	%	Comb.	%
1 (Poor)	3	.8			3	.5
2 (Fair)	67	17.5	28	15.3	95	17.3
3 (Good)	171	44.8	85	46.4	256	45.3
4 (Excellent)	141	36.9	70	38.3	211	37.3
Total	382	100.0	185	100.0	565	100.0

Table 37

Frequency Distribution of Ill and Well Missionaries  
by Missionary Emotional Health Rating

Missionary Emotional Health Rating	Missionary Health Status					
	Ill	%	Well	%	Comb.	%
1 (Poor)	8	2.1	1	0.5	9	1.6
2 (Fair)	78	20.4	17	9.3	95	16.8
3 (Good)	147	38.5	79	43.2	226	40.0
4 (Excellent)	149	39.0	86	47.0	235	41.6
Total	382	100.0	183	100.0	565	100.0

missionaries either a 3 or 4 score on emotional health. The mean, median, and mode were 3.14, 3, and 4 respectively. By comparison, 183 well missionaries were scored similarly; their mean was 3.36, their median was 3, and their mode was 4.

Such a similarity of responses is deceiving when contrasted with findings derived from the following model:

$$\text{EMOTIONAL HEALTH} = \mu + \text{Mission} + \text{Health} + (\text{Mission} \times \text{Health}) + \text{Error}$$

Both mission and health were found to be significantly related to emotional health. Specifically, a least square means for well missionaries was slightly higher than means for ill missionaries. The independent variable, mission, was also significantly related to emotional health. Once again, that finding was thought to imply a judgment difference among mission presidents. Table 38 demonstrates the relationship of emotional health and health status through numerical means.

Table 38

Least Squares Means of Emotional Health  
Ratings by Missionary Health Status  
Dec. 1979 - March 1980

Missionary Health Status	Least Squares Means for Emotional Health Ratings
Ill	3.16
Well	3.36

### Interpersonal Relationships

Table 39 shows that there were 382 observations received from mission presidents who rated ill missionaries on interpersonal relationships. Forty-five percent of the ill missionaries were given an excellent rating. The mean for this variable was determined to be 3.35; the median was 3; and the mode was 4.

As seen above, a majority (53.6%) of the 183 well missionaries received a 4 rating. It was therefore not surprising that the median and mode were also found to be 4. The mean followed closely behind at 3.46.

A general linear model was devised to determine whether health was significantly correlated with interpersonal relationship. The model employed is written below.

$$\text{INTERPERSONAL RELATIONSHIP} = \text{Mission} + \text{Health} + (\text{Mission} \times \text{Health}) + \text{Error}$$

Statistical analysis found mission to be the only variable which was significantly related to interpersonal relations.



Table 39

Frequency Distribution of Ill and Well Missionaries  
by Missionary Interpersonal Relationship Rating  
Dec. 1979 - March 1980

Missionary Relationship Rating	Missionary Health Status					
	Ill	%	Well	%	Comb.	%
1						
2	39	10.2	14	7.7	53	9.4
3	171	44.8	71	38.8	242	42.8
4	172	45.0	98	53.6	270	47.8
Total	382	100.0	183	100.0	565	100.0

#### Motivation and Enthusiasm

The last variable mission presidents were asked to rate their ill and well missionaries on concerned motivation and enthusiasm. Table 40 organizes the president's responses in numerical form. In total, 383 ill missionaries received a computed mean of 3.24,

Table 40

Frequency Distribution of Ill and Well Missionaries  
by Missionary Motivation and Enthusiasm Rating  
Dec. 1979 - March 1980

Missionary Motivation & Enthusiasm Rating	Missionary Health Status					
	Ill	%	Well	%	Comb.	%
1	9	2.4	1	.5	10	1.8
2	62	16.2	25	4.2	87	15.4
3	138	36.1	67	36.6	205	36.3
4	173	45.3	90	49.2	263	46.5
Total	382	100.0	183	100.0	565	100.0

a mean of 3, and a mode of 4. One hundred eighty-three well missionaries also received a median of 3 and a mode of 4. The mean, however, was 3.34.

A general linear models procedure was used to determine whether or not health was significantly related to the dependent variable. This model is symbolized below.

$$\text{MOTIVATION AND ENTHUSIASM} = \mu + \text{Mission} + \text{Health} + (\text{Mission} \times \text{Health}) + \text{Error}$$

Mission was the only independent variable which was significantly related to motivation and enthusiasm.

In addition to the four general linear models employed to determine significant relationships between dependent and independent variables, a Wilk's criterion multivariate analysis was also conducted to test the hypothesis that mission, health, and their interactions had no overall effect on the four dependent variables. The criterion analysis resulted in the finding that there was only a .0001 chance that mission had no overall effect. Furthermore, the analysis also indicated there was only a .0283 chance that health had no overall effect. Thus, it may be stated that mission and health on an overall basis did significantly effect the ratings of missionaries on social and emotional factors.

## Chapter 5

### SUMMARY

#### Statement of Problems

The main purpose of this study on Mormon missionary health was to determine the effect of illness and injury on missionary activity time. In addition, two subproblems were also studied. The first subproblem attempted to ascertain the effect of selected variables on ill missionary lost-time and other dependent factors and the second subproblem sought to find out what social and emotional health factors as reported by mission presidents were related to missionary health.

#### Review of Literature

A review of the literature revealed a general lack of research on the subject of missionary health. The majority of studies done, however, centered on hepatitis and showed that quarterly gamma globulin injections significantly reduced the amount of hepatitis experienced in the mission field.

#### Procedure

Missionaries from seven randomly selected missions were asked to submit a missionary illness and injury report every week they were

sick or hurt during a four-month period. These reports requested information concerning the missionaries' health conditions. All missionaries who submitted a report were classified in the "ill" group. Missionaries who did not, however, turn in a report were categorized as "well" and at the end of the four-month period, a sample from this group was surveyed retrospectively concerning their health conditions.

Twenty-seven randomly selected mission presidents comprised a third group of surveyed individuals. Seven of the 27 mission presidents administered missions who participated in the missionary health research project. These seven individuals were asked to judge every missionary within their mission who took part in the health research in terms of certain social and emotional factors. Furthermore, all surveyed mission presidents were requested to report the incidence of specified emotionally disturbed behaviors within their mission.

Data was returned to the Church Office Building in Salt Lake and placed on computer tape. The Statistical Analysis System (SAS) was utilized to analyze the data. Analysis of variance, co-variance, and chi-square tests were employed to determine if significant relationships existed between various dependent and independent variables.

### Findings

Based on the data collected in this study, the following findings were reported:

1. Estimated ill missionary and well missionary activity times over a three-month period were not significantly different from each other at the .05 level of confidence.

2. The most common missionary health problems were respiratory ailments, gastro-intestinal difficulties, and orthopedic injuries.

3. A vast majority of ill missionaries reported their illness/injury was not a result of any pre-existing condition developed prior to their mission.

4. Almost 53% of ill missionaries experienced at least one episode of their illness/injury previously in the mission field.

5. On the average, 9.3 proselyting hours per missionary were lost due to injury/illness over a four-month period.

6. Of the ill missionaries, 40.6% indicated they received no treatment for their illness or injury.

7. Preventive health instruction was usually given to missionaries by physicians and mission presidents.

8. Surveyed missionaries reported a total of 49 days of hospitalization.

9. Of the missionaries who incurred medical costs, 75% spent \$50 or less on their recovery.

10. Well missionaries were generally older in age than ill missionaries.

11. Sex was not significantly related to missionary health.

12. The number of months in the field was significantly related to the health of the missionary. Generally well missionaries had been serving longer than ill missionaries.

13. The population of the city wherein the missionary was serving was not significantly related to missionary health.

14. Monthly mission costs were significantly related to missionary health.

15. Ill missionaries generally judged the adequacy of their mission's medical care higher than well missionaries.

16. The major obstacle to eating balanced meals was reported to be cost by both ill and well missionaries.

17. "Present" energy levels between ill and well missionaries were not significantly different.

18. Individually, mission effectiveness, interpersonal relationships, and motivation and enthusiasm were not significantly related to missionary health status. However, on an overall basis, the three foregoing variables were significantly related to health.

19. Well missionaries were judged higher by mission presidents on a scale regarding emotional health than were ill missionaries.

20. Computed rates for illness/injury placed the seven surveyed missions in the following rank order: England-London East; New Zealand-Wellington; Philippines-Davao; California-Fresno; Japan-Toyko South; Bolivia-LaPaz; Mexico-Mexico City North.

21. Total proselyting time lost was significantly related to the type of diagnosis and whether or not medication was taken.

### Conclusions

The following conclusions were made from the results of this study:

1. Mission circumstances varied so vastly from each other that "across the board" generalities regarding missionary health problems were difficult to make.

2. Overall, missionaries were found to be a very healthy group of individuals as compared to employed U.S. white collar, blue collar, service, and farm workers during the year 1975-1976 (41).

3. Most of the injuries/illnesses experienced by missionaries did not cause a great deal of lost proselyting time.

4. Missionaries do not appear to be eating adequately balanced diets.

5. The majority of missionaries appear to be well adjusted as reported by mission presidents.

### Recommendations

As a result of this study, the following recommendations are suggested:

1. Publish a handbook on health promotion techniques for missionaries within specified mission regions. Include nutritional, quick menus based on local foodstuffs.

2. Teach health mini-courses to missionaries at the Mission Training Center. These mini-courses could promote preventive health hygiene and warn about health hazards peculiar to the specific mission area.

3. Include a health seminar on health problems at the Mission President's orientation meeting.
4. Develop a yearly survey instrument on missionary health to be filled out by missionaries and mission presidents of all specific missions.
5. Recommend that prospective missionaries who go to college before their mission, take a basic health course.
6. Request that ill missionaries fill out their report forms after completion of their illness.

#### Recommendations for Further Study

1. A specific study on female missionary health conditions would be beneficial.
2. A study on the health of mission presidents and their families would be advantageous.
3. A sensitive survey instrument to study missionary diet and to study the amount of psychosomatic illness needs to be developed.
4. A study on specific health conditions and problems of missionary couples is needed.
5. The area of emotional health of Mormon missionaries has been relatively unresearched. A study on this subject has tremendous implications.
6. A study on the feasibility of calling retired physicians on missions to strategic areas with their purpose being to look after missionary health would be advantageous.



7. A revised instrument survey form would prove beneficial as it would accomplish the following:

- a. contain more precise information on missionary health.
- b. allow for the questioning of the same missionaries during the first six months and during the last six months of their mission. Thus, matched comparison of the missionaries could be made to see if culture shock and new responsibilities are partially responsible for illnesses.
- c. include a method of data collection which will allow anonymity of the missionary reporting his illness or medical history. This could be done by assigning each missionary the last four digits of his social security number. (If the missionary is not a U.S. citizen, then have the mission president assign him a four digit number.) This would allow missionary companions, zone leaders, mission presidents, etc. to answer a questionnaire about the missionary from each person's viewpoint that would be very beneficial to research. No one in the mission field is to know what any other person says except as it may concern eccleasical authority. It is assumed that a mission president, however fair, will influenced in his medical report from the information he sees if viewing the forms filled out by missionaries. Also, missionaries are likely to be more open in filling out a medical form if they knew it wasn't going to be reviewed by those in authority over them.
- d. include information that may deal with emotional or psychosomatic illness. (See Appendix for forms.)

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APPENDIX A

Mission President's Survey of Missionary Illness and Injury

**INSTRUCTIONS:** Please complete this survey form and return it with all accumulated Missionary Illness and Injury Reports and Ill-Missionary Profiles for the four-month period. Your assistance is greatly appreciated.

Mission \_\_\_\_\_ Date \_\_\_\_\_

1. How many hours per week have you instructed your missionaries to spend in proselyting activities (including study time)? \_\_\_\_\_ hours per week.
2. Please estimate the total number of proselyting hours (excluding study time) lost among your missionaries each month due to illnesses and injuries. \_\_\_\_\_ hours.
3. Please indicate the dollar value of mission-home expenses (U.S. \$ per month) going towards the treatment and care of illnesses and injuries among your missionaries by filling in the spaces below:
 

Office calls for medical reasons: \$ _____	Medications \$ _____
Surgery/special medical procedures \$ _____	Other (_____) \$ _____
Total/month \$ _____	
4. Please indicate by circling a number between 1 and 7 on the scale below how adequate you would judge the quality of health care facilities and services that are readily available to the missionaries in your mission.
 

Not adequate in quality    1    2    3    4    5    6    7    Adequate in quality
5. Which of the following food groups is most neglected by your missionaries?
 

( ) meat    ( ) milk    ( ) fruits    ( ) vegetables    ( ) cereals and grains
6. What would you consider to be the greatest obstacle to your missionaries in eating regularly from the above food groups? (Check one)
 

( ) cost    ( ) time    ( ) availability    ( ) preparation    ( ) other \_\_\_\_\_
7. Please indicate the estimated number of cases for the following kinds of illnesses or injuries which have occurred in your mission during the past twelve (12) months.

<u>Illness or injury</u>	<u>Estimated no. of cases</u>	<u>Illness or injury</u>	<u>Estimated no. of cases</u>
1) Colds, flu, other upper respiratory infections, sore throats	_____	9) Orthopedic problems of knee, foot, back, ankle, hip or other joints	_____
2) Other infections (hepatitis, malaria, yellow fever, typhoid, etc.)	_____	10) Heart or circulatory problems	_____
3) Boils, impetigo, fungus, other skin infections	_____	11) Eye or ear problems	_____
4) Fleas, scabies, lice	_____	12) Cavities, wisdom teeth, other oral problems	_____
5) Stomach aches, diarrhea, amoebic dysentery, food poisoning, appendicitis, other intestinal disorders	_____	13) Headaches, nausea, fatigue	_____
6) Heat exhaustion/stroke	_____	14) Sprains, strains or dislocations	_____
7) Cuts and/or abrasions	_____	15) Broken bones	_____
8) Kidney, bladder, or genital problems	_____	16) Frostbite	_____
		17) Other _____	_____

8. Information concerning the social and emotional health of your missionaries is also vital to this study. These factors are difficult to measure, but we will appreciate your judgments in responding to the following:

<u>Indicators of Social/Emotional Problems</u>	<u>Number of current missionaries you know to be experiencing this difficulty</u>	<u>Number of current missionaries you estimate are experiencing this difficulty</u>
1) Difficulty sleeping or falling asleep.	_____	_____
2) Sick much of the time with colds, headaches, stomach upsets and other minor ailments.	_____	_____
3) Withdraws from others, does not like to associate with other missionaries.	_____	_____
4) Shows little or no emotion, either happy or sad.	_____	_____
5) Cannot get over guilt from past mistakes.	_____	_____
6) Overly sensitive to the opinion and/or criticism of others.	_____	_____
7) Continually worried about something.	_____	_____
8) Constantly discouraged or depressed.	_____	_____
9) Constantly elated.	_____	_____
10) Compulsively performs certain rituals such as constant hand washing.	_____	_____
11) Feels that others (companions, investigators, members, etc.) cannot be trusted.	_____	_____
12) Ridged, demanding and controlling of others.	_____	_____
13) Rapidly jumps from one idea to other disconnected ideas. No logical or understandable sequence to thought patterns.	_____	_____
14) Feels tired most of the time.	_____	_____
15) Must always have his own way.	_____	_____
16) Total number of individual missionaries exhibiting one or more of the above indicators of social/emotional problems.	_____	_____

9. What is the one most serious health problem faced by missionaries in your mission?

10. Do you have any additional health concerns that we have not addressed? Please describe them.

\_\_\_\_\_  
Mission President's Signature      Date

APPENDIX B



## ILL-MISSIONARY PROFILE

**INSTRUCTIONS:** Please complete this profile and attach it to the Illness and Injury Report(s) of the missionary whose name appears on this sheet. Both the Ill-Missionary Profile and all Illness and Injury Report(s) should be forwarded at the end of the four-month period to the Missionary Department.

Missionary's Name: \_\_\_\_\_

Mission: \_\_\_\_\_

Please indicate below how effective you judge this missionary to be in his or her proselyting assignment, how well adjusted you feel the missionary is emotionally and socially, and how much personal energy this missionary exhibits in the performance of his or her mission calling.

	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>
Teaches and proselytes effectively.	_____	_____	_____	_____
Emotionally healthy and happily engaged in missionary work.	_____	_____	_____	_____
Gets along well with companion and others.	_____	_____	_____	_____
Is self-motivated and enthusiastic about the work.	_____	_____	_____	_____

\_\_\_\_\_ Initials of mission president

APPENDIX C

## WELL-MISSIONARY PROFILE

**INSTRUCTIONS:** Please complete this profile on the missionary whose name appears on this sheet. Mail directly to the Missionary Department in Salt Lake City.

Missionary's Name: \_\_\_\_\_

Mission: \_\_\_\_\_

Please indicate below how effective you judge this missionary to be in his or her proselyting assignment, how well adjusted you feel the missionary is emotionally and socially, and how much personal energy this missionary exhibits in the performance of his or her mission calling.

	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>
Teaches and proselytes effectively..	_____	_____	_____	_____
Emotionally healthy and happily engaged in missionary work.	_____	_____	_____	_____
Gets along well with companion and others.	_____	_____	_____	_____
Is self-motivated and enthusiastic about the work.	_____	_____	_____	_____

\_\_\_\_\_ Initials of mission president

APPENDIX D

### MISSIONARY ILLNESS AND INJURY REPORT FORM

**INSTRUCTIONS:** Complete this form and send it to the mission home each week in which you experience a new illness or injury or a continuation of a previous illness or injury. Different unrelated illnesses or injuries occurring in the same week should be reported on separate report forms.

Name: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: M F Height: \_\_\_\_\_ Weight: \_\_\_\_\_  
 Mission: \_\_\_\_\_ National Homeland: \_\_\_\_\_  
 Today's date: \_\_\_\_\_ Number of months in the field: \_\_\_\_\_ months  
 Name of city, town or village in which you labor: \_\_\_\_\_ Approx. Population: \_\_\_\_\_  
 Monthly cost to labor in your mission: \_\_\_\_\_  
 How many illnesses or injuries are you currently reporting? One only: \_\_\_\_\_ Two or more: \_\_\_\_\_  
 Is this report the first one you've filed on this illness or injury or a subsequent report due to the continuation of a previous illness or injury? Initial: \_\_\_\_\_ Subsequent: \_\_\_\_\_

1. Please enter the average number of hours per week you estimate you have worked during the past three months in missionary activities (include study time):  
       \_\_\_\_\_ hours per week
2. Please indicate by circling a number between 1 and 7 on the scale below how living conditions in your current field of labor compare with those you experienced at your home before your mission.  
       Much better    7    6    5    4    3    2    1    Much Worse
3. Over a three-day period, how many times (average) do you eat from each of the food groups listed below? (Indicate the number of times in each category.)  
       ( ) meat    ( ) milk    ( ) fruits    ( ) vegetables    ( ) cereals and grains
4. What would you consider to be the greatest obstacle to eating regularly from the above food groups? (Check one)  
       ( ) cost    ( ) time    ( ) availability    ( ) preparation    ( ) other \_\_\_\_\_

#### Description of Illness

5. Please check the item(s) below which best describe(s) the nature of your current illness or injury:
 

<input type="checkbox"/> Cold, flu, other upper respiratory infection, sore throat <input type="checkbox"/> Other infection (hepatitis, malaria, yellow fever, typhoid, etc.) <input type="checkbox"/> Boils, impetigo, fungus, other skin infection <input type="checkbox"/> Fleas, scabies, lice <input type="checkbox"/> Stomach ache, diarrhea, amoebic dysentery, food poisoning, appendicitis, other intestinal disorder <input type="checkbox"/> Heat exhaustion/stroke <input type="checkbox"/> Cut and/or abrasion <input type="checkbox"/> Kidney, bladder, genital problem	<input type="checkbox"/> Orthopedic problem of knee, foot, back, ankle, hip or other joints <input type="checkbox"/> Heart or circulatory problem <input type="checkbox"/> Eye or ear problem <input type="checkbox"/> Cavities, wisdom teeth, other oral problem <input type="checkbox"/> Headache, nausea, fatigue <input type="checkbox"/> Sprain, strain or dislocation <input type="checkbox"/> Broken bone <input type="checkbox"/> Frostbite <input type="checkbox"/> Other _____
--	--
6. Please explain exactly what the illness or injury consisted of or was diagnosed as: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
7. How long did this incident of illness or injury last? \_\_\_\_\_ days \_\_\_\_\_ hours  
 (If you are still ill or injured give the date the illness began or injury occurred: \_\_\_\_\_)
8. Was the illness or injury a result of a condition which existed before your mission? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, what was the nature of the preexisting illness or injury? \_\_\_\_\_  
 \_\_\_\_\_
9. Have you experienced this same illness or injury before on your mission? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, a. How many times have you experienced it? \_\_\_\_\_ times  
 b. How long since you last experienced it? \_\_\_\_\_ (days, weeks, months)

10. Did the illness/injury cause you to lose any hours of proselyting time? (Excluding study time)  
 Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, a. How many hours of time were lost? \_\_\_\_\_ hours  
 b. How many hours of time did your companion lose during your illness? \_\_\_\_\_ hours
11. Please indicate by circling a number between 1 and 7 on the scale below:  
 a. How you feel your health allowed you to perform your proselyting activities (excluding study time) during the period of your illness or injury:  
 Maximum energy level 7 6 5 4 3 2 1 Greatly reduced energy level  
 b. How you are presently performing:  
 Maximum energy level 7 6 5 4 3 2 1 Greatly reduced energy level

Description of Treatment

12. Did you receive advice and/or treatment for this illness or injury? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, from whom did you receive such advice or treatment?  
 physician       nurse       MTC       other (indicate) \_\_\_\_\_  
 self       a member       pharmacist  
 companion       mission president       dentist
13. Have you received advice and or instruction which has specifically helped you avoid or prevent illness or injury? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, from whom did you receive such advice or instruction?  
 physician       nurse       MTC       other (indicate) \_\_\_\_\_  
 self       a member       pharmacist  
 companion       mission president       dentist
14. Did you take any medication for this illness or injury? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, who recommended or prescribed the medication?  
 physician       nurse       MTC       other (indicate) \_\_\_\_\_  
 self       a member       pharmacist  
 companion       mission president       dentist
15. Do you take medications, vitamins, or other products which you feel have aided you in preventing illness?  
 Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, what are you taking? \_\_\_\_\_  
 Who recommended or prescribed the medication, vitamin, etc.  
 physician       nurse       MTC       other (indicate) \_\_\_\_\_  
 self       a member       pharmacist  
 companion       mission president       dentist
16. Were you hospitalized for your current illness? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, for how long? \_\_\_\_\_ days
17. Please indicate by circling a number between 1 and 7 on the scale below how adequate you would judge the quality of the medical care you received.  
 Adequate in quality 7 6 5 4 3 2 1 Inadequate in quality
18. If treatment was required for your accident or illness please indicate below, in U.S. dollars, all associated costs.  
 Medical practitioner \$ \_\_\_\_\_ Medication \$ \_\_\_\_\_  
 Hospital \$ \_\_\_\_\_ Total Costs \$ \_\_\_\_\_
19. Please check below who paid for, or who in your understanding will pay, associated treatment expenses:
- |                      | <u>Self</u> | <u>Parents</u> | <u>Mission</u> | <u>Insurance</u> |
|----------------------|-------------|----------------|----------------|------------------|
| Medical practitioner | _____       | _____          | _____          | _____            |
| Hospital             | _____       | _____          | _____          | _____            |
| Medication           | _____       | _____          | _____          | _____            |
20. Are you personally covered by a health insurance policy? Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_
21. Are there additional comments or insights which you could provide which might help us understand this illness or accident and its impact upon your missionary work? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

APPENDIX E

## MISSIONARY ILLNESS AND INJURY REPORT FORM

Name: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: M F Height: \_\_\_\_\_ Weight: \_\_\_\_\_  
 Mission: \_\_\_\_\_ National Homeland: \_\_\_\_\_  
 Today's date: \_\_\_\_\_ Number of months in the field: \_\_\_\_\_ months  
 Name of city, town or village in which you labor: \_\_\_\_\_ Approx. Population: \_\_\_\_\_  
 Monthly cost to labor in your mission: \_\_\_\_\_

1. Please enter the average number of hours per week you estimate you have worked during the past three months in missionary activities (include study time):

\_\_\_\_\_ hours per week

2. Please indicate by circling a number between 1 and 7 on the scale below how living conditions in your current field of labor compare with those you experienced at your home before your mission.

Much better    7    6    5    4    3    2    1    Much worse

3. Over a three-day period, how many times (average) do you eat from each of the food groups listed below? (Indicate the number of times in each category.)

( ) meat    ( ) milk    ( ) fruits    ( ) vegetables    ( ) cereals and grains

4. What would you consider to be the greatest obstacle to eating regularly from the above food groups? (Check one)

( ) cost    ( ) time    ( ) availability    ( ) preparation    ( ) other \_\_\_\_\_

Description of Illness

5. Please check the item(s) below which best describe(s) the nature of the most common illnesses or injuries in your mission:

- |  |  |
|--|--|
| ( ) Cold, flu, other upper respiratory infection, sore throat  | ( ) Kidney, bladder, genital problem                                   |
| ( ) Other infection (hepatitis, malaria, yellow fever, typhoid, etc.)                                  | ( ) Orthopedic problem of knee, foot, back, ankle, hip or other joints |
| ( ) Boils, impetigo, fungus, other skin infection  | ( ) Heart or circulatory problem                                       |
| ( ) Fleas, scabies, lice   | ( ) Eye or ear problem   |
| ( ) Stomach ache, diarrhea, amoebic dysentery, food poisoning, appendicitis, other intestinal disorder | ( ) Cavities, wisdom teeth, other oral problem                         |
| ( ) Heat exhaustion/stroke   | ( ) Headache, nausea, fatigue  |
| ( ) Cut and/or abrasion  | ( ) Sprain, strain or dislocation                                      |
|  | ( ) Broken bone  |
|  | ( ) Frostbite  |
|  | ( ) Other _____  |

6. Are there any illnesses or injuries you experienced prior to your mission that have bothered you since being in the mission field?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what was the nature of the preexisting illness or injury? \_\_\_\_\_

7. In the last four months, how many hours of proselyting time have you lost due to the illnesses or injuries of your companions? \_\_\_\_\_



8. Please indicate by circling a number between 1 and 7 on the scale below:

a. How you feel your health has allowed you to perform proselyting activities (excluding study time) during the last four months.

Maximum energy level 7 6 5 4 3 2 1 Greatly reduced energy level

b. How you are presently performing.

Maximum energy level 7 6 5 4 3 2 1 Greatly reduced energy level

Description of Treatment

9. Have you received advice and/or instruction which has specifically helped you avoid illness or injury?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, from whom did you receive such advice or instruction?

- physician
- self
- companion
- nurse
- a member
- mission president
- MTC
- pharmacist
- dentist
- other (indicate) \_\_\_\_\_

10. Do you take medications, vitamins, or other products which you feel have aided you in preventing illness?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what are you taking? \_\_\_\_\_

Who recommended or prescribed the medication, vitamin, etc.

- physician
- self
- companion
- nurse
- a member
- mission president
- MTC
- pharmacist
- dentist
- other (indicate) \_\_\_\_\_

11. Please indicate by circling a number between 1 and 7 on the scale below how adequate you would judge the quality of medical care available in your area.

Adequate in quality 7 6 5 4 3 2 1 Inadequate in quality

12. Please check below who in your understanding would be responsible to pay for respective treatment expenses if you were to become ill or have an accident.

	<u>Self</u>	<u>Parents</u>	<u>Mission</u>	<u>Insurance</u>
Medical practitioner	_____	_____	_____	_____
Hospital	_____	_____	_____	_____
Medication	_____	_____	_____	_____

13. Are you personally covered by a health insurance policy?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_

14. Are there any additional comments or insights you could provide to help us understand why you have successfully avoided becoming sick or injured during the last four months? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

APPENDIX F

## REVISED MISSIONARY HEALTH SURVEY

BY RAYMOND G. BRISCOE, PH.D.  
 Research Associate  
 for the Church of Jesus Christ  
 of Latter-day Saints

## DIRECTIONS:

This form is to be filled out by all missionaries during the first six months of their mission. Specifically, if a missionary does get sick during the 6 month survey period, he is to fill it out on the first day after he is back proselyting full-time. If a missionary does not get sick during the 6 month survey period, he should fill it out at the last day of the 6 month time frame.

1. Mission Identification Number: \_\_\_\_\_
2. Missionary Identification Number: \_\_\_\_\_  
 (Please list the last four digits of your Social Security number. If you do not have one, list a four digit number assigned by the mission.)
3. Companion's Identification Number \_\_\_\_\_
4. Over the last 10 weeks, how many hours per week would you estimate you spend in the following activities: (Please circle your response.)

	less than 3 hours	3 to 5 hours	6 to 7 hours	8 to 9 hours	10+ hours
a. Studying the scriptures	1	2	3	4	5
b. Studying the gospel other than scriptures	1	2	3	4	5
c. Preparation day work	1	2	3	4	5
d. Preparation day recreation	1	2	3	4	5

	less than 20 hours	21-30 hours	31-40 hours	41-50 hours	51-60 hours	61+ hours
e. Actively teaching the gospel or trying to find persons to teach	1	2	3	4	5	6
f. Other mission related work	1	2	3	4	5	6

5. Please circle the number that best represents how you would judge:

	Excellent			OK			Poor
a. The quality of diet you had at home.	7	6	5	4	3	2	1
b. The quality of diet you have presently.	7	6	5	4	3	2	1

6. How many days have you eaten the following foods during the last week?

milk	1	2	3	4	5	6	7
meat	1	2	3	4	5	6	7
fruits/vegetables	1	2	3	4	5	6	7
cereals/grains	1	2	3	4	5	6	7

7. On the last day that you (or your regular cook) prepared your own food, how many servings of the following food groups did you have?

a. milk	1	2	3	4	5	6	7	8+
b. meat	1	2	3	4	5	6	7	8+
c. fruits/vegetables	1	2	3	4	5	6	7	8+
d. breads/cereals	1	2	3	4	5	6	7	8+

7a. Has your food consumption during the last week been:

	More than normal	Less than normal	About the same as normal
milk	1	2	3
meat	1	2	3
fruits/vegetables	1	2	3
cereal/grains	1	2	3

8. Which of the following do you consider to be an obstacle in eating a regular diet from the above food groups?

	major obstacle	obstacle	no obstacle
a. money	1	2	3
b. time	1	2	3
c. food unavailability	1	2	3
d. ability to prepare food	1	2	3
e. other _____ (specify)	1	2	3

9. Please circle all the numbers that apply to your health history:

Illnesses	Had the illness frequently at home	Had illness frequently on mission	Had illness more than once on mission	Had illness once on mission	Have illness now
Cold, flu, sore throat, upper respiratory infection	1	2	3	4	5
Other infection (hepatitis, malaria, typhoid, etc.)	1	2	3	4	5
Boils, impetigo, fungus, other skin infection	1	2	3	4	5
Fleas, scabies, lice	1	2	3	4	5
Stomach ache, diarrhea, amoebic dysentary, appendicitis, other intestinal disorders	1	2	3	4	5
Heat exhaustion/stroke	1	2	3	4	5
Cut and/or abrasion	1	2	3	4	5
Kidney, bladder, genital problem	1	2	3	4	5
Orthopedic problem of knee, foot, back, ankle, hip or other joints	1	2	3	4	5
Heart or circulatory problem	1	2	3	4	5
Eye or ear problem	1	2	3	4	5

Illnesses	Had the illness frequently at home	Had illness frequently on mission	Had illness more than once on mission	Had illness once on mission	Have illness now
Cavities, wisdom teeth other oral problem	1	2	3	4	5
Headache, nausea, fatigue	1	2	3	4	5
Sprain, strain or dislocation	1	2	3	4	5
Broken bone	1	2	3	4	5
Frostbite	1	2	3	4	5
(other)	1	2	3	4	5

10. Please explain exactly what the illness or injury consisted of or was diagnosed as: \_\_\_\_\_

11. How many days has/did your medical problem last? (Circle response)

less than one	1
one	2
two	3
three	4
four to five	5
six to ten	6
eleven to fifteen	7
sixteen to twenty-five	8
twenty-six plus	9

12. In your judgement, is your current or recent medical problem related to previous home illnesses or injuries?

yes	1
no	2
don't know	3

If yes, what is the relationship? \_\_\_\_\_

13. How many hours have you lost during the last 7 days because of illness?

less than 5	6-10	11-20	21-30	31-50	More than 51
1	2	3	4	5	6

- |  | less<br>than 5 | 6-<br>10 | 11-<br>20 | 21-<br>30 | 31-<br>50 | more<br>than 51 |
|--|----------------|----------|-----------|-----------|-----------|-----------------|
| 14. How many <u>hours</u> have you been unable to effectively study?                           | 1              | 2        | 3         | 4         | 5         | 6               |
| 15. How many <u>hours</u> have you been unable to spend in effective relaxation?               | 1              | 2        | 3         | 4         | 5         | 6               |
| 16. How many <u>hours</u> has your illness made you unable to spend in proselyting activities? | 1              | 2        | 3         | 4         | 5         | 6               |

17. How many days was your ability impaired to teach and seek contacts effectively during this current illness?

less than one	one	two	three- four	five- six	seven plus	
1	2	3	4	5	6	a. Days greatly effected
1	2	3	4	5	6	b. Days somewhat effected
1	2	3	4	5	6	c. Days with no effect

18. How many days were you in the hospital during this last illness?

one	two	three- four	five- six	seven plus
1	2	3	4	5

19. Did you go to the office of a physician or to a hospital to be treated for this illness? (Circle response)

yes: 1  
no; 2

20. How available are the following to you?

	Very available	Available	Not available	Not available at al
Quality physician	1	2	3	4
Quality nurse	1	2	3	4
Quality pharmacist	1	2	3	4
Quality dentist	1	2	3	4

21. How much help to you are the following for good medical advice?

	Very helpful	Somewhat helpful	Not very helpful	Not helpful at all
Yourself	1	2	3	4
Your compan- ion	1	2	3	5
A local mem- ber	1	2	3	5

	Very helpful	Somewhat helpful	Not very helpful	Not helpful at all
MTC	1	2	3	4
Mission mother	1	2	3	4
Mission president	1	2	3	4
Welfare service missionaries	1	2	3	4

22. How much do the following individuals know about you or care about you?

	Cares about me very much	cares about me somewhat	Doesn't care about me very much	Doesn't care about me hardly at all	Knows me very well	Knows me somewhat	Doesn't know me well	Doesn't know me at all
Your companion	1	2	3	4	1	2	3	4
A local member	1	2	3	4	1	2	3	4
A person at the MTC	1	2	3	4	1	2	3	4
District leader	1	2	3	4	1	2	3	4
Zone leader	1	2	3	4	1	2	3	4
Mission Mother	1	2	3	4	1	2	3	4
Mission President	1	2	3	4	1	2	3	4

23. To whom do you go to seek medical advice and what medical advice have you been given? (Circle all that apply.)

	Recommended a medical product or method to solve a medical problem	Received advice and/or treatment for illness that was helpful	Received advice and/or treatment for illness and did not help	Received advice and/or treatment for illness and became worse	Gave me recommendations on how to prevent illness	Recommended a medical product or method to prevent illness
self	1	2	3	4	5	6
companion	1	2	3	4	5	6
local member	1	2	3	4	5	6
mission mother	1	2	3	4	5	6
mission president	1	2	3	4	5	6
MTC	1	2	3	4	5	6
nurse	1	2	3	4	5	6
pharmacist	1	2	3	4	5	6
dentist	1	2	3	4	5	6
physician	1	2	3	4	5	6



24. In your judgement, how would you define your mental state during the last two to three weeks?

Very depressed	Depressed	Happy	Very Happy
1	2	3	4

25. How many letters have you received from home during the last thirty days?

No letters	One Letter	Two letters	Three letters	Four letters	Five +
1	2	3	4	5	6

26. Do you have personal problems of concern back home with family or friends?

Significant personal problems	Moderate personal problems	No personal problems
1	2	3

27. Are you having personal problems with individuals in your mission?

Significant personal problems	Moderate personal problems	No personal problems
1	2	3

28. Are you finding your work assignments to be:

Very repetitive	Somewhat repetitive	Somewhat differ- ent and new	Very different and new
1	2	3	4

29. Before you came on your mission did you wonder if you would have illness while you were on this mission?

Definitely wondered if I would	Probably wondered if I would	Did not wonder if I would	Did not at all wonder if I would
1	2	3	4

30. Did you expect that problems of a medical nature would occur after you got in the mission field?

Definitely expected it would	Probably expected it would	Probably did not expect it would	Definitely did not expect it would
1	2	3	4

31. Height (in inches) \_\_\_\_\_

32. Weight (in pounds) \_\_\_\_\_

PLEASE CIRCLE THE CORRECT RESPONSES:

33. Sex: Male 1  
Female 2

34. Age:	18-19 years	1
	20 years	2
	21 years	3
	22-23 years	4
	24-29 years	5
	30-65 years	6
	65+ years	7

35. Marital Status:	Single (never married)	1
	Single (divorced)	2
	Single (spouse deceased)	3
	Married	4

36. Native country:	USA	1
	Canada	2
	Mexico	3
	Great Britain	4
	Other _____ (name)	5

37. Number of Months in the Field:	First six monts	1
	Last six months	2

38. Please indicate what sources money is coming from to pay for your mission:

PERCENTAGES

Self	_____
Parents	_____
Other family	_____
Ward or Stake	_____
Other	_____
	100%

## MISSIONARY COMPANION FORM

Directions to missionary companions:

Please respond to questions 6-13 as they relate to you and respond to questions 1-5 as they relate to your companion. Your Mission President and Zone Leader will also be filling out questions 1-5 in relation to your companion.

Mission Number \_\_\_\_\_

Missionary Identification Number \_\_\_\_\_

Missionary Companion Number \_\_\_\_\_

1. How much help to your companion are the following for good medical advise?

	<u>Very Helpful</u>	<u>Somewhat Helpful</u>	<u>Not Very Helpful</u>	<u>Not Helpful at All</u>
a. Himself/herself	1	2	3	4
b. Yourself	1	2	3	4
c. A Local Member	1	2	3	4
d. Mission Training Center	1	2	3	4
e. Mission Mother	1	2	3	4
f. Mission President	1	2	3	4

2. Please judge yourself in relationship to your companion:

a.	You care about him very much	You care about him somewhat	You do not care about him very much	You do not care about him at all
	1	2	3	4
b.	You know him very well	You know him somewhat	You do not know him very well	You do not know him at all
	1	2	3	4

3. In your judgement would your companion say:

a.	You care about him very much	You care about him somewhat	You do not care about him very much	You do not care about him at all
	1	2	3	4

4. In your judgement do you feel your companion anticipated (that is, wondered) if he would have illness while on his mission

Definitely wondered if he would	Probably wondered if he would	Did not wonder if he would	Did not at all wonder if he would
1	2	3	4

5. Did your companion expect that problems of a medical nature would occur before he got in the mission field

Definitely expected they would	Probably expected they would	Probably did not expect they would	Definitely did not expect they would
1	2	3	4

6. Over the last 10 weeks, how many hours per week would you estimate you spent in the following activities: (Please circle your response.)

	<u>less than 3 hours</u>	<u>3 to 5 hours</u>	<u>6 to 7 hours</u>	<u>8 to 9 hours</u>	<u>10+ hours</u>
a. Studying the scrip- tures	1	2	3	4	5
b. Studying the gospel other than scriptures	1	2	3	4	5
c. Preparation day work	1	2	3	4	5
d. Preparation day recre- ation	1	2	3	4	5

	<u>less than 3 hours</u>	<u>21-30 hours</u>	<u>31-40 hours</u>	<u>41-50 hours</u>	<u>51-60 hours</u>	<u>61+ hours</u>
e. Actively teaching the gospel or trying to find persons to teach	1	2	3	4	5	6
f. Other mission related work	1	2	3	4	5	6

7. Please circle the number that best represents how you would judge:

	Excellent			OK			Poor
a. The quality of diet you had at home.	7	6	5	4	3	2	1
b. The quality of diet you have presently.	7	6	5	4	3	2	1

8. How many days have you eaten the following foods during the last week?

milk	1	2	3	4	5	6	7
meat	1	2	3	4	5	6	7
fruits/vegetables	1	2	3	4	5	6	7
cereals/grains	1	2	3	4	5	6	7

8a. Has your food consumption during the last week been:

	More than normal	Less than normal	About the same as normal
milk	1	2	3
meat	1	2	3
fruits/vegetables	1	2	3
cereal/grains	1	2	3

9. On the last day that you (or your regular cook) prepared your own food, how many servings of the following food groups did you have?

a. milk	1	2	3	4	5	6	7	8+
b. meat	1	2	3	4	5	6	7	8+
c. fruits/vegetables	1	2	3	4	5	6	7	8+
d. breads/cereals	1	2	3	4	5	6	7	8+

10. How available are the following to you?

	Very Available	Available	Not Available	Not available at all
Quality physician	1	2	3	4
Quality nurse	1	2	3	4
Quality pharmacist	1	2	3	4
Quality dentist	1	2	3	5

11. In your judgement, how would you define your mental state during the last two to three weeks?

Very depressed	Depressed	Happy	Very Happy
1	2	3	4

12. How many letters have you received from home during the last thirty days?

No letters	One letter	Two letters	Three letters	Four letters	Five +
1	2	3	4	5	6

13. Do you have personal problems of concern back home with family or friends?

<u>Significant personal problems</u>	<u>Moderate personal problems</u>	<u>No personal problems</u>
1	2	3

14. Are you having personal problems with individuals in your mission?

<u>Significant personal problems</u>	<u>Moderate personal problems</u>	<u>No personal problems</u>
1	2	3

15. Are you finding your work assignments to be:

<u>Very repetitive</u>	<u>Somewhat repetitive</u>	<u>Somewhat differ- ent and new</u>	<u>Very different and new</u>
1	2	3	4

HEALTH PROBLEMS OF SELECTED LDS MISSIONARIES  
THROUGHOUT THE WORLD

Susan Jensen

Department of Health Sciences

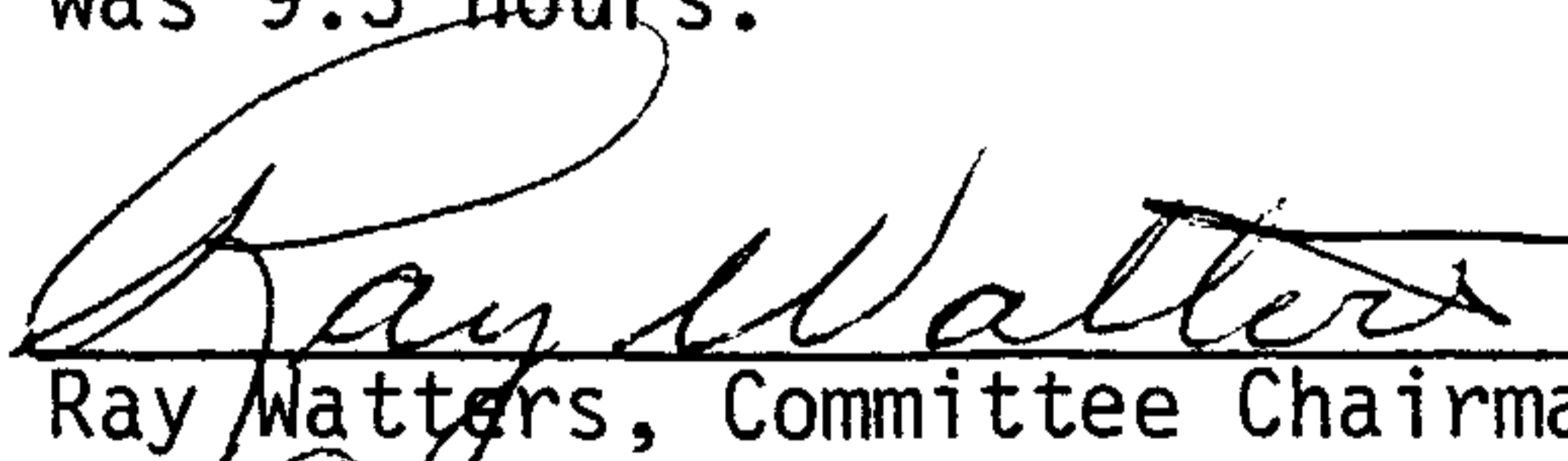
M.S. Degree, December 1981


ABSTRACT


The purpose of this study on Mormon missionaries was to determine the effect of health on missionary activity time, age, sex, months in field, laboring city population, monthly mission cost, living conditions, diet, pre-existing conditions, adequacy of medical care, nativity, effectiveness, emotional health, interpersonal relationships, and motivation and enthusiasm. In addition the research attempted to ascertain the effect of the selected independent factors on ill missionary lost time.

As an outcome of the statistical analysis performed on this study's sample the following results were obtained. Respiratory disorders, gastrointestinal difficulties and orthopedic injuries were the most common health problems. Well missionaries were generally older, spent more money, had been out longer in the field and were judged in better emotional health than were ill missionaries. Ill missionaries rated the adequacy of medical care higher than their counterparts. Sex, activity time over a three month period, and laboring city population were not found to be significantly related to missionary health. The average amount of lost proselyting time per missionary over a four-month period was 9.3 hours.

COMMITTEE APPROVAL :

  
Ray Watters, Committee Chairman

  
Donald D. Shaw, Minor Committee  
Member

  
Ronald R. Rhodes, Department  
Chairman