CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

DEVELOPMENT OF A THEORETICAL PREVENTION MODEL
FOR SENILE DEMENTIA

A thesis submitted in partial satisfaction of the requirements for the degree of Master of Science in
Health Science
by
Michele Yvonne Bonant

May, 1975
The thesis of Michele Yvonne Bonant is approved:

______________________________________________
Committee Chairman

California State University, Northridge
May, 1975
To

My Grandparents

JAMES AND CONCETTA BONANT

My son, take care of your father when he is old; grieve him not, as long as he lives. Even if his mind fail, be considerate with him; revile him not in the fullness of your strength. For kindness to a father will not be forgotten . . . it will take lasting root.

Sirach 3:12-14
ACKNOWLEDGMENTS

I am indebted to Dr. Anthony M. Alcocer for his continued support as graduate advisor and thesis chairman. His enthusiasm and interest in the mental health needs of the community were most inspirational.

I also wish to extend gratitude to Dr. Goteti B. Krishnamurty for assistance with research methodology. In addition to his expertise and valuable suggestions, he provided a veritable source of encouragement.

Appreciation is extended also to my family and friends for their encouragement, but most of all for their patience. Without their support, this work would never have been completed.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION</td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>ix</td>
</tr>
<tr>
<td><strong>Chapter</strong></td>
<td></td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>SIGNIFICANCE OF THE PROBLEM</td>
<td>6</td>
</tr>
<tr>
<td>ORGANIZATION OF THE STUDY</td>
<td>9</td>
</tr>
<tr>
<td>THEORETICAL FORMULATION</td>
<td>11</td>
</tr>
<tr>
<td>2. REVIEW OF THE LITERATURE</td>
<td>14</td>
</tr>
<tr>
<td>THE AGED POPULATION</td>
<td>14</td>
</tr>
<tr>
<td>AGING AND SENILE DEMENTIA</td>
<td>30</td>
</tr>
<tr>
<td>PREVENTION OF SENILE DEMENTIA</td>
<td>73</td>
</tr>
<tr>
<td>SUMMARY</td>
<td>85</td>
</tr>
<tr>
<td>3. RESEARCH METHODOLOGY</td>
<td>87</td>
</tr>
<tr>
<td>4. ANALYSIS</td>
<td>91</td>
</tr>
<tr>
<td>THE NATURAL HISTORY OF SENILE DEMENTIA</td>
<td>91</td>
</tr>
<tr>
<td>LEVELS OF PREVENTION MODEL</td>
<td>102</td>
</tr>
<tr>
<td>SUMMARY</td>
<td>128</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>5. DISCUSSION AND RECOMMENDATIONS</td>
<td>129</td>
</tr>
<tr>
<td>EPIDEMIOLOGIC AND DEMOGRAPHIC VARIABLES</td>
<td>129</td>
</tr>
<tr>
<td>DEFINING A TARGET POPULATION</td>
<td>129</td>
</tr>
<tr>
<td>SPECIFIC RECOMMENDATIONS BASED UPON IDENTIFIED NEEDS</td>
<td>135</td>
</tr>
<tr>
<td>IMPLICATIONS FOR HEALTH EDUCATION</td>
<td>158</td>
</tr>
<tr>
<td>SUMMARY OF RECOMMENDATIONS</td>
<td>162</td>
</tr>
<tr>
<td>HYPOTHESES</td>
<td>163</td>
</tr>
<tr>
<td>6. CONCLUSIONS AND SUMMARY</td>
<td>165</td>
</tr>
</tbody>
</table>

APPENDICES

| A. FINANCING ADULT DAY CARE | 171 |
| B. PARTIAL LIST OF DAY CARE CENTERS IN OPERATION | 176 |
| C. ORGANIZATIONS PERTAINING TO THE ELDERLY | 179 |
| D. THEORETICAL TRAINING PROGRAM FOR LAY COUNSELORS | 181 |

REFERENCES 183
LIST OF TABLES

Table                                                                 Page

1. Morbidity Risk for Senile Dementia, Both Sexes . . .  38
2. Life-table Expectancy for Senile Dementia, Calculated for a Stationary Population . . . . .  39
3. Incidence of Senile Dementia in Various Age Groups .  41
4. Prevalence of Senile Dementia in Various Age Groups .  41
5. Marital Status of Females with Senile Dementia and Females in the General Population (Queensland) . .  45
6. Marital Status of Males with Senile Dementia and Males in the General Population (Queensland) . .  45
### LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The Relationship Between Dementia Score and Mean Plaque Count in 60 Brains Post Mortem</td>
<td>53</td>
</tr>
<tr>
<td>2.</td>
<td>The Relationship Between Test Score and Mean Plaque Count in 60 Brains Post Mortem</td>
<td>53</td>
</tr>
<tr>
<td>3.</td>
<td>Simplified Illustration of Factors Influencing Health Equilibrium</td>
<td>74</td>
</tr>
<tr>
<td>4.</td>
<td>Prepathogenesis and Pathogenesis Periods of Natural History</td>
<td>75</td>
</tr>
<tr>
<td>5.</td>
<td>Diagram Showing the Application of Preventive Medicine</td>
<td>77</td>
</tr>
<tr>
<td>6.</td>
<td>Schematic for Derived Prevention Model</td>
<td>89</td>
</tr>
<tr>
<td>7.</td>
<td>The Natural History of Senile Dementia</td>
<td>101</td>
</tr>
<tr>
<td>8.</td>
<td>Levels of Application of Preventive Measures in the Natural History of Disease</td>
<td>103</td>
</tr>
<tr>
<td>9.</td>
<td>Schematic Breakdown of Activity Areas Used in the Prevention Model</td>
<td>105</td>
</tr>
<tr>
<td>10.</td>
<td>Theoretical Training Model for Lay Counselors</td>
<td>148</td>
</tr>
</tbody>
</table>
ABSTRACT

DEVELOPMENT OF A THEORETICAL PREVENTION MODEL FOR SENILE DEMENTIA

by

Michele Yvonne Bonant

Master of Science in Health Science

May, 1975

Senile dementia is one of the most disabling diseases of the aged population. Its cause is unknown, and as yet, there is no cure. Preventive medicine has been practiced for centuries. However, prevention of senile dementia is a relatively new concept. The dual purpose of this paper was to design a theoretical prevention model for senile dementia, and to derive the natural history of senile dementia. The problem presented was whether or not it is possible to develop such theoretical formulations based solely upon the available literature.

The methodology consisted of an exploratory or formulative approach to research. The specific methods utilized include: (1) reviewing the available literature on senile dementia and prevention, (2) designing a theoretical prevention model and natural history outline for senile dementia, and (3) exploring the implications of such a model to activities in community health.
As part of the analysis of data, information presented in the literature review was incorporated into a prevention model. Data were represented as conditions and needs associated with physiological, psychological, and situational variables of the disease, senile dementia. Needs or conditions not specified in the literature were noted as deficiencies in the literature and subsequently supplied by the author.

The prevention model was organized on three levels, primary, secondary, and tertiary, as outlined by Leavell and Clark in 1968. Primary level prevention consists of: (1) health promotional activities related to nutrition, health education, personality development, genetics, housing, recreation, the overall level of living, working conditions, and periodic selective examinations, and (2) activities aimed at specific protection against disease such as: use of specific nutrients, crisis intervention, protection from accidents, and attention to personal hygiene.

Secondary level prevention activities include: (1) early diagnosis and treatment by means of individual and mass case-finding, screening surveys, and selective examinations, and (2) disability limitation. Tertiary level prevention consists primarily of rehabilitative activities.

Discussion of the prevention model was organized as if data were to be used to develop a specific program for senile dementia. First, the natural history outline was linked with epidemiological variables to disease and the concept of a target population. Next, the prevention model was discussed according to various levels and
activities. Emphasis was placed on needs and conditions not identified in the literature. However, the ramifications of needs and conditions present in the literature also were explored.

Finally, two concepts were introduced in hypothetical form. These were titled, the Theory of Communicability, and the Theory of Co-Variable Etiopathology. Both of these concepts were related to senile dementia; however, they should provide external validity upon analysis, especially since they can be applied to other diseases and disorders with little or no modification.
Chapter 1

INTRODUCTION

That senility is an eventual outcome of the aging process appears to have been culturally ingrained. As a result, most signs and symptoms in geriatric patients are attributed to age, and a "wastebasket" diagnosis of senility is made. Error in diagnosis is perpetuated by the fact that there is no clear-cut distinction between normal aging and pathological processes. Also, as Müller and Ciompi (1968) have suggested, precise and common definitions are lacking.

Senescence is a deteriorative process, the measure of which is a decrease in viability and an increase in vulnerability (Comfort, 1964). The fine line between normal, predictable senescent deterioration and abnormal senile pathological degeneration, as yet, has not been identified in either etiopathological or clinical terms. Verwoerdt and Eis dorfer (1967) proposed that the term senility be reserved for a pathologic entity occurring in late senescence, and that it should not be applied to normal pre-death deterioration. This proposal is qualitative, however, and quantitative delineation remains undefined.

Isaacs (1965) approached the problem of definition by suggesting that the psychological changes in old age be placed on a continuum. According to Isaacs, the point on this continuum where normality becomes abnormal and senile pathological changes begin can be defined socially. Senile dementia is a disorder set apart
Senile dementia (dementia senilis) is a chronic brain disorder caused by a generalized atrophy of the brain due to aging. Also known as senile psychosis, this disease is characterized by personality deterioration, progressive loss of memory, eccentricity, and irritability (American Psychiatric Association, 1957). Pathologically, there is a progressive loss of cells from the cerebral cortex. Cells lost are replaced by senile plaques and neurofibrillary structures (Isaacs, 1965:108). Although a number of observations and correlations have been made, the etiology of senile dementia is still unknown.

Clinical manifestations. The predominant clinical manifestations pathognomonic to senile dementia include:

(1) characteristics suggestive of an amnestic syndrome such as, severe impairment of immediate recall, shortened retention span, loss of recent and remote memories, and confabulations (Kral, 1972)

(2) signs of personality deterioration, for example, a steady, progressive decline in personality with apathy, depression, anxiety, and irritability, in addition to confusion and disorientation for time, place, and person, and

(3) a number of other symptoms such as, auditory and visual hallucinations, rambling and incoherent speech, sleeplessness,
restlessness, wandering, paranoid tendencies with anger and violence, and sphincter incontinence. All of these manifestations occur in sequence. Early signs of senile dementia may simply be regarded as senility; however, as time passes it becomes apparent that signs and symptoms are abnormal in degree (Pearce & Miller, 1973). The disease itself begins insidiously and terminates in death from vegetative extinction.

Nosological definition. Senile dementia has emerged only recently as a distinct nosological entity. Alexander (1972) traced the history of this disease as it evolved into an important psychiatric concept. The following illustrates this historical perspective.

As early as 1838, J. E. D. Esquirol published the Traité des Maladies Mentales which provided a comprehensive description of the psychiatric deviations associated with senile decline. The "démence sénile" concept stated in this treatise was too broad in the sense that it included a number of senile disorders.

The following year, 1839, C. F. Canstatt in Die Krankheiten des höhern Alters und ihre Heilung, volumes 1 and 2, applied the term "senile dementia" to the same group of disorders described by Esquirol. From 1840 on, a gradual breakdown in the classification of senile disorders was observed. Examples of the specific nosological variations derived appear below in chronological order.

1. states of mental weakness
   a. apathetic dementia
      1) senile dementia
      2) ............
2. senile insanity
   a. senile dementia
   b. ...........

3. states of mental enfeeblement
   a. senile dementia
   b. ...........

As clinical pathology advanced, a neuropathological distinction between senile dementia (senile psychosis) and arteriosclerotic psychosis became evident.

In summary, the term senile dementia has been reported in the literature and in clinical areas for some time. However, during most of this time, the term was employed in an ill-defined and over-inclusive manner, such that it usually included a heterogeneity of senile disorders.

**Historical Perspectives Related to the Problem**

In order to promote research on aging and provide adequate medical services for the aged, the American Geriatrics Society and the Gerontological Society, Inc. were formed respectively in 1942 and 1944 (Tompkins, 1955). The medical specialty of geriatrics focuses on medical practice as it functions in the care of the aged. Gerontology is classified as a field of study concerned with the aging process itself. Biologists, psychologists, and sociologists often channel their interests to gerontological research.

Over two decades ago, a Governor's Conference (1950) on the care and treatment of senile patients concluded that the most effective
way to ensure the aged quality living is to assist individuals before they become aged. Specifically, the Conference recommended that adequate food, housing, and medical care be provided before the age when senility becomes a threat to health and life. What this Conference suggested was that preventive medicine is preferred to curative treatment. Since there is no cure for senile dementia, prevention is the only viable alternative.

**Community services.** The establishment of community-based geriatric programs to provide continuity in diagnosis, treatment, and placement plans, was recommended by a President's Task Force in 1970 (Group for the Advancement of Psychiatry, 1970). It has been suggested that community mental health centers, now over seven to ten years old, and well beyond preliminary orientation, might be able to consider specialized geriatric care. However, in 1971 community mental health centers in the inner city and rural areas were serving only 15% of those individuals aged sixty-five and over (Group for the Advancement of Psychiatry, 1971). In view of the mental health needs of the aged, these services are minimal.

**Social attitudes toward mental illness.** Data collected by Cumming and Cumming (1955) support the assumption that people tend to fear and avoid the mentally ill. The data also showed that popular thinking about mental illness tends to be confused and inconsistent. The single most important criterion in this survey for adjudging a person sane or insane, was whether or not the individual had been institutionalized. In other words, hospitalization indicated insanity.
Paul (1955:4) pointed out that each community has a developed set of ideas, attitudes, and modes of behavior in response to the persistent demands of social living. As observed by Cumming and Cumming (1955) the attitude of fear toward the mentally ill is one social response. Paul recommended re-educating the community in order to eliminate these biases. It is anticipated that once the stigma attached to mental illness is eliminated, more persons will seek and benefit from psychiatric care.

SIGNIFICANCE OF THE PROBLEM

There is a gradual shrinkage of the life-space of the elderly. Cappon (1971) suggested that the life-space evolves from a rectangular cradle to a rectangular coffin-like space. Figuratively speaking, an analogy between this observation and social relationships can be drawn. The cradled infant has limited social interaction. Social relationships increase throughout life, but eventually they begin to taper off in old age. Finally, the rectangular coffin-like space represents the advanced stages of senile dementia, with total disorientation for time, place, and person, and diminished social interaction.

Quantitative Justification

The number of aged individuals doomed to live in a coffin-like space is indicated by selected observations. For example, Haberman (1970) discovered that high psychiatric symptom scores reported in community surveys were positively related to older age. In a survey of general practice, Watts (1964) reported that the highest rate of mental illness exists in patients sixty-five years of age and over.
Similarly, a random sample study of individuals age sixty-five and over revealed that 33% of the men and 42% of the women in this age group need psychiatric and/or social help (Anderson, 1964).

The overall number of individuals age sixty-five and over increases each year. Presently, there are around twenty million persons age sixty-five and older in the United States. In the year 2000, this group will constitute thirty million persons (U.S. Bureau of Census, 1974a). The gravity of the problem of mental illness in the aged is elicited by calculating the number of individuals doomed to psychiatric distress in later life.

Qualitative Justification

Despite the fact that those age sixty-five and over comprise over ten percent of the total population in the United States (U.S. Bureau of Census, 1974a), only a small percentage of these individuals suffering from mental and emotional disorders receive proper care. Goldstein (1973) reported that this failure to obtain proper care reflects: (1) a lack of knowledge and poor communication within the medical and paramedical professions, (2) misinterpretation of signs and symptoms, with both physician and patients focusing on physical rather than mental disorder, and (3) a nihilistic attitude towards problems of the elderly. Goldstein also remarked that patients are often referred to psychiatrists for "disposal" purposes rather than for treatment.

The aged are particularly in need of help due to their vulnerability to mental disorder. This vulnerability is based on earlier retirement ages and rapid social changes which have weakened family
ties. In addition, a negative stereopathy toward treating the aged makes it difficult to find physicians specializing in geriatrics. When this "ageism" is combined with racism, it is extremely difficult for the aged to obtain proper mental health care (Group for the Advancement of Psychiatry, 1971). Spanish speaking persons, blacks, and American Indians are confronted with this double jeopardy.

Jeff and Roth (1969) pointed out some of the present shortcomings in health care for the aged. These deficiencies are caused by an excess of crisis admissions, indiscriminate selection of assigned unit at the time of admission, and a defective integration of services, and medical and social disciplines. Moreover, the existence of narrow, short-term perspectives limits the value of treatment and after-care.

As stated above, the problems peculiar to the aged exist today for a number of reasons. Specifically, research in biological senescence has been neglected in the past for two reasons. First, the early efforts to extend human life failed and were identified with quacks and charlatans. Second, few scientists engaged in research on aging because of lack of financial support from outside sources. Also the fear of acquiring a bad reputation prevented many scientists and physicians from becoming involved in aging research (Prehoda, 1968:25). In addition, it is difficult to attract young physicians to specialize in psychogeriatric services in hospitals (Arie, 1971). Thus, the care of the aged is restricted not only by the lack of new discoveries, but also by a deficiency of qualified practitioners who could utilize the new techniques discovered.
ORGANIZATION OF THE STUDY

Always there is a need to seek understanding and a collective, referential body of knowledge of disease. Where this understanding is minimal, as is the case with senile dementia, activities must be directed toward collecting baseline data. All relevant sources of information must be identified and utilized. Once data is retrieved it must be examined, interpreted, and shared within the scientific community. Ultimately, the efforts of medical research must be directed toward the prevention and cure of disease.

All preventive efforts begin with observation and interpretation. Epidemiology, "the study of the distribution and determinants of disease frequency in man" (MacMahon & Pugh, 1970), is the most important research activity relevant to prevention. Epidemiology involves an extension of the discipline of demography to health and disease.

The variables examined in an epidemiologic study include: (1) factors related to host susceptibility such as, age, sex, genetics, race, familial susceptibility, ethnicity, religion, marital status, occupation, and socio-economic status, (2) factors related to the agent of the disease, and (3) environmental factors which include biologic, chemical, physical, and social variables (Taylor & Knowelden, 1964; Paul, 1966; MacMahon & Pugh, 1970).

"In epidemiology the focus of observation is a group of individuals, and the observations refer to the whole group, including both the afflicted and the non-afflicted" (Leavell & Clark, 1965:41).
The focus of this specific research project is the aged population which includes those well and those afflicted with senile dementia.

Methodologic Approach

Although a causative agent for senile dementia has not been identified, it is still possible to plan for the prevention of this disease. Without knowing the cause of cholera, Snow (1855) was able to manipulate environmental factors and reduce the incidence of the disease. By exploiting circumstances in a natural experiment, Snow succeeded in identifying the mode of communication of cholera--water from a particular commercial company. As a result of Snow's efforts the etiologic agent of cholera eventually was discovered. Similar efforts must be applied to other disease entities. Formulative or exploratory research on senile dementia is one approach to identifying data that can be used to test hypotheses.

Sellitz et al. (1959:52) stated that "without some knowledge of the scope of the area, of the major social variables influencing mental health, of the settings in which these variables occur, any hypothesis that is set forth is likely to be trivial. In the case of problems about which little knowledge is available, an exploratory study is usually most appropriate."

Overview of Organization

The concept of preventing senile dementia is relatively new. As such, little has been reported in the literature concerning prevention of this disease. However, there is an abundance of literature which defines this disease and describes selected variables related
to its pathogenesis. Also, there is selected material available on
the epidemiologic approach to the prevention of disease. Combining
this information in an exploratory research study, results in a struc-
tured, ordered corpus of knowledge of senile dementia. Such data
derived can be used to design a prevention model for senile dementia.

THEORETICAL FORMULATION

Purpose

The purpose of this paper was two-fold: (1) to derive the
natural history of senile dementia, and (2) to construct a theoretical
prevention model for senile dementia.

Statement of the Problem

Research problems not involving experimentation are stated
best in the form of a question. The following two questions reflect
the purpose of this paper in problematic context.

I. Given data from the available literature, is it possible
to derive the natural history of senile dementia?

II. Given data from the available literature, is it possible
to design a theoretical prevention model for senile dementia?

Definitions

The following terms are defined in order to specifically
delineate the statement of the problem and the purpose of this project.

(1) to design—is to construct according to a plan for a spe-
cific function or end. The plan of this paper included a review of
the available literature and the organization of data from the litera-
ture into the structure of a prevention model.
(2) prevention model—refers to a structural pattern designed to point out stages within the course of the natural history of a disease which can be intercepted so as to forestall or preclude an otherwise harmful outcome.

(3) senile dementia—is a chronic brain disorder caused by a generalized atrophy of the brain due to aging (American Psychiatric Association, 1957). Also known as senile psychosis, this disease is defined as a mental illness of old age which manifests itself by personality deterioration, progressive loss of memory, eccentricity, and irritability (American Psychiatric Association, 1957; Mayer-Gross, Slater, & Martin, 1969). Senile dementia is further characterized by "shrinkage and atrophy of the brain secondary to loss of nerve cells and shrinkage of cells. Senile plaques are always present; these are roundish areas of tissue degeneration with granular or filament-like detritus. Sometimes Alzheimer neurofibrillary whorls are seen within the cytoplasm." There is no direct correlation between the amount of pathological change and the appearance of symptoms, indicating that tissue damage alone is not responsible for this syndrome (Hensie & Campbell, 1970:693).

(4) available literature—is defined as all books, journals, and periodicals reviewed which provided relevant and current information. Highly clinical journal publications were rejected as being beyond the scope and purpose of this paper. Books also were scrutinized according to the validity of data they contained. For example, earlier publications which offered valuable historical perspectives were accepted. In addition, basic textbooks in public health were
included in order to establish guidelines for the public health
approach to the principles of prevention and program development.

(5) natural history of a disease—is the course of disease in
man from the preliminary interaction of a potential agent, host, and
environmental factors to the changes in form and function which result,
or until equilibrium is reached or recovery, defect, disability or
death ensues (Leavell & Clark, 1965:17).

Assumption
This paper presupposed that the definition of senile dementia
was constant in all of the literature reviewed.

Limitations
As defined above, this project was limited to only available,
published literature. The time period during which retrieval of data
took place was from September 1973 to January 1975. Publications
written in English, French, and German were included in the survey of
the literature. Articles available in other languages were accepted
only when translated into English, French, or German summaries.
Chapter 2

REVIEW OF THE LITERATURE

An extensive review of geriatric and gerontological literature provided the basis for the construction of a theoretical prevention model for senile dementia. This search extended to three major areas: (1) literature defining the aged population, (2) publications describing the characteristics of the aged afflicted with senile dementia, and (3) literature related to the prevention of senile dementia. References cited include those published in the literature between 1943 and 1974.

THE AGED POPULATION

The following demographic characteristics were used in surveying the literature to describe the aged: age, sex, race, marital status, residence, geographic distribution, and indices of socioeconomic status. Physical, psychological, and situational changes also describe this population, but only in terms of general "observable" characteristics. Finally, the aging process itself and the theories related to its causation were used to further define the condition of the population being studied.

Demographic Characteristics

Butler and Lewis (1973) have described the demographic characteristics of the aged in their book, Aging and Mental Health; Positive
Psychosocial Approaches. Unless otherwise indicated, the following variables were reported in this text.

Age. The aged have been arbitrarily defined as being sixty-five years of age or older. The Germans established this line of demarcation in the 1880's through the social legislation of Chancellor Otto von Bismark. Western society has retained it for social purposes. In the United States there are presently around twenty million people who are age 65 or older. This is over 10% of the total population. Furthermore, it has been estimated that by 1980 there will be close to 25 million aged. The projection for the year 2000 approaches 30 million (U.S. Bureau of Census, 1974a, 1974b).

Sex. The life expectancies between men and women display a marked difference. It was estimated that in 1970 there were approximately 139 females to 100 males age 65 and older in the United States.

Race. In 1970 a comparison between the aged white population and the aged black population revealed that although the black population comprised 10% of the total population, black people made up only 8% of the aged population in the United States. In addition, the black population had a consistently higher death rate than the white population at all ages for both male and female, except at 85 years of age and older in which case the rate was less than half that of whites. Data on sex and race showed that 56% of the black aged population was female.

Marital Status. A greater percentage of women remain single than do men. In fact, there are almost two times as many single women as men
in the age group 65 years and older. Statistics show that two-thirds of all elderly women are widowed, whereas only one-third of aged men are widowed.

The usual finding upon observation is that most elderly men are married, while most elderly women are widowed. The divorced status for both men and women is almost equal.

Residence. Ninety-five percent of the aged live in the community with a spouse, family, or friends. Seventy percent of those living in the community live with their families. Elderly women are three times more likely to live alone or with non-relatives than men. It was reported in 1971 that only 5% of older persons live in institutions such as homes for the aged, nursing homes, mental hospitals, and foster homes.

Geographic distribution. The elderly tend to live most frequently in the central parts of cities and in rural areas. It has been projected that in twenty years the suburb areas may be predominantly elderly, even though at present the aged population in suburbia is relatively low.

Specific areas in the United States, such as northern New England, and the Midwest have a high concentration of older people. Florida, in particular, has the highest proportion of the elderly, 13.2% of the state population. Other states including Iowa, Kansas, Maine, Massachusetts, Nebraska, New Hampshire, South Dakota, and Vermont have higher proportions of aged than the national average.
Housing. Thirty percent of the aged in the United States live in substandard housing. Poverty and marginal income are contributing factors. Although two-thirds of the aged own their own homes, most of these dwellings have deteriorated and have become a liability rather than an asset. The remaining elderly live alone, with relatives or friends, in tenement houses, retirement villages, retirement hotels, or low and middle class housing subsidized by churches and benevolent associations.

Income and employment. In 1970 the Index of Poverty in the United States was $1,852 yearly per person aged 65 and over. In comparison, the median income in 1968 for elderly persons living alone or with non-relatives was $1,734. More than 25% of older persons lived below the standard Index of Poverty in 1970. Although older persons represent only 10% of the total population, they comprise 20% of the poor in the United States.

The sources of income for the elderly vary. Continued employment contributes 29% to the aged person's income. Fifty-two percent of income is from retirement, and welfare programs. The remaining 19% is received from investments and contributions from relatives. Social Security ceilings on earnings and age discrimination are two major factors which hamper an elderly person from obtaining or keeping employment.

Health. The aged are afflicted with chronic health problems to a much greater extent than the general population. Eighty-six percent of the elderly are so afflicted and as such, require more physician's visits,
and more and longer hospital stays. Indeed, they average fourteen days of hospitalization per year. Mental illness, particularly depression, increases with advancing age (Farber, 1970). Furthermore, it has been observed that white males in their 80's have a high suicide rate.

**Education.** Only 6% of the aged population in the United States hold college diplomas or degrees. One-seventh, or 3 million, aged are functionally illiterate with either no schooling or less than five years.

**Observable Characteristics of the Aged**

The observable characteristics of the aged population can be reviewed as physical, psychological, and situational variables. Demographic characteristics, as provided, define the aged in quantitative terms. The following review supplies a qualitative description of the population under several categories.

**Physical changes.** Advancing age produces a myriad of changes. For example, physical changes occurring in the brain cause a sharp increase in water content with a corresponding decrease in dry weight (Mayer-Gross, Slater, & Martin, 1969:535; Milne & Milne, 1968:224). The average weight of the brain falls from 1,375 grams (3.03 lbs.) at age 30 to 1,232 grams (2.72 lbs.) at age 90 (Prehoda, 1968:20). In conjunction with these cerebral modifications, the overall number of functioning nerve cells decreases (Milne & Milne, 1968:224).

Other organs of the body are likewise affected by senescence. For instance, the skin tends to lose its texture as fat cells descend
from surface areas to lower levels within the tissues. A reduction in collagen and a loss of sexual hormones hastens this process (Milne & Milne, 1968:214; Peck, 1970:137). Loss of muscle tone, strength and bulk contribute to a diminution of the ability to perform tasks requiring muscular strength. In addition, the ability to perform skilled movements is hampered by a loss of balance and coordination (Peck, 1970:137).

Anatomical modifications. There are many factors contributing to these performance reductions. For example, as a result of aging, discs of cartilage between adjacent bones in the vertebral column begin to atrophy. Beyond sixty years of age a half inch reduction in height is observed due to the progression of this atrophy (Milne & Milne, 1968:224).

Reduction in performance also is attributed to a 10 to 15% decline in the speed of nerve impulses along single fibers (Prehoda, 1968:20). Further neurological alterations lead to loss of acuity in vision, hearing, touch, taste, and smell (Pck, 1970:137; Milne & Milne, 1968:216). Due to a stiffening of the lenses (presbyopia), the eyes lose the ability to focus from far to near (Milne & Milne, 1968:217; Burnside, 1973). Also the upper limit of the hearing range begins to descend with advancing age (Milne & Milne, 1968:219).

Morphological alterations occur in the cardiovascular system, such that arteriosclerosis becomes a major problem to contend with. A condition known as senile cardiovascular amyloidosis greatly reduces the efficiency of an already stressed cardiovascular system. Senile cardiovascular amyloidosis is described by Rubenstone et al. (1971) as
the deposition of amyloid material in the coronary arteries and veins, pulmonary arteries, the aorta, cerebral vessels, and some peripheral and lymph vessels.

Biochemical alterations. In addition to these physical alterations, important biochemical changes take place within the aging body. As a result, the concentration of total proteins, lipids, nitrogen, and phosphorus begins to fall, whereas the concentration of DNA (deoxyribonucleic acid) and sulfur increases (Mayer-Gross, Slater, & Martin, 1969:535). Accompanying these changes is a marked decline in the body's capacity for self-repair and reproduction, a suggested cause of progressive loss of cells (Prehoda, 1968:20).

Reduction in physiological capacity. Also observed is a reduced physiological capacity. For instance, maximum breathing capacity and oxygen uptake both decrease by about fifty percent (Milne & Milne, 1968:227), such that at age 75, the average heart pumps only 65% as much blood as at age 30, and the brain receives only 80% as much blood (Prehoda, 1968:20). Moreover, there is a 55% reduction in renal function due to a decrease in the number of functional filtering units (glomeruli) (Milne & Milne, 1968:227). Associated with this is a 42% decrease in the flow of blood to the kidneys which is adaptive in that it permits a greater flow of blood to the brain than would otherwise be possible (Prehoda, 1968:20).

An overview of function reveals that reductions occur in most all of the major organ systems of the aging body. This overall reduction in function can be ultimately measured by the degree of fatigue
related to a given quantity of activity. Milne and Milne (1968:225) reported that the maximum work load without developing fatigue decreases about 60% between the ages 35 and 80.

**Psychological changes.** The psychological changes of old age are on a continuum. The point at which normality becomes abnormal and senile dementia begins is socially and culturally defined, as is the case for all mental diseases. According to Isaacs (1965:163) this continuum ranges from a tendency to conservatism, caution, and sagacity, at one end, to the pathological state of senile dementia on the other. Factors which stimulate movement along this continuum are reviewed later as etiological variables to senile dementia.

Overholser and Fong (1954) outlined the stages of normal senium, the first objective signs of which are a slight decrease in alertness, slowed responses, and narrowing of the span of interest. These signs progress to an "insidious" loss of memory in the field of spontaneous recall, so that earlier events are remembered with clarity, while recent events are mentally "misplaced." Normality, sometimes judged by scores on psychological tests, must be defined for any given population. For this reason, Britton and Savage (1965) suggested that MMPI scores, a measure of normality, be adjusted for deviations from the standard population due solely to age.

Two types of adult mental capacity, the "fluid" and the "crystalline," were hypothesized by Cattell (1943). The ability to perceive new relations is "fluid," whereas "crystalline" capacity refers to long-established habits which do not require "insightful" perception for their successful operation. While the "fluid" capacity
declines with senescence, the "crystalline" is unaffected, and according to Cattell, could possibly sustain intellectual achievement into old age.

The psychologically "preserved" aged person is capable of looking after his immediate personal needs and enjoying satisfactory interpersonal relationships with people of all ages. Moreover, he is able to adjust to the changing demands of his environment. The "normal" aged person experiences a slowing of integrated processes of the central nervous system which produces a condition of "benign forgetfulness." Such forgetfulness is characterized by an inability to recall certain unimportant data of an event, even though the event itself may be recalled. Forgotten data, in such cases, are available at other times, indicating that "benign" type of senescent forgetfulness is due to impaired recall (Kral, 1972).

Emotional changes. Emotional changes in the aged are all directly influenced by the interaction of philosophy of life, religious faith, physical health, and status in the family group. The presence or degree of intellectual decline and sensory deprivation also contributes to emotional imbalance in the elderly (Isaacs, 1965:152). Moreover, experimental evidence shows that the aged are very cautious, prefer the familiar, are reluctant to take new pathways, and are resistant to change. A diminution of spontaneity accompanies this "emotional package" (Isaacs, 1965:153).

A condition known as "senile delinquency" is characterized by irritability, stubbornness, and pettiness. In addition to these "character" changes, there is one significant emotional response in
the aged, that is, "disengagement." Disengagement refers to the tendency to withdraw from the center of the stage of life (Isaacs, 1965:153).

Intellectual changes. An experimental study conducted by Owens (1966) revealed that there is a trend downward in mental ability in aged subjects. The conclusions drawn were that patterns of living govern or modify the relationship of age to mental ability, and that "cognitive decline, like cognitive development, is conditioned to some extent on the nature and intensity of environmental stimulation" (Owens, 1966).

Intellectual deterioration is inferred by a progressive decline in the ability to analyze objects in terms of their spacial relationships, that is visuo-spatial analysis (Isaacs, 1965:155). Moreover, the time between stimulus and response increases with the increasing age of the subject (Isaacs, 1965:154). This sensory-motor slowing produces a lag in decision making. As a result, most intellectual achievement seen in old age is usually the product of ideas first thought of earlier in life (Mayer-Gross, Slater, & Martin, 1969:537).

Situational factors in aging. Social, cultural, and environmental factors influence the process of aging. Such variables are situational and reside outside of the individual, but nevertheless influence his functioning. For example, events in the "normal expectable development of the family life cycle are found to be crucial transition points for individuals" (Rapaport, 1963:68). Some of these events are not eased by anticipatory socialization, cultural rites of
passage, or prescribed role behavior. As such, they are stress producing and are detrimental to the mental health of the senior family member.

An individual's expectations and reactions to aging are influenced by his cultural orientation toward the "aged" as a group (Brehm, 1968). For example, the American system of retirement introduces a conflict between cultural demands on one hand, and personal capabilities on the other (Crawford, 1971).

In a recent study, it was found that both men and women identify retirement as disengagement. However, significantly more women than men \((p < 0.01)\) viewed retirement as disengagement (Crawford, 1971). Tallmer and Kutner (1969) found that age was not the variable which produced disengagement, but rather disengagement is the result of an impact of physical and social stress which increases with age. In other words, they hypothesized that disengagement among the aged can be predicted to occur as a concomitant of physical or social stress. Gerontologists have expressed caution, however, in applying a universal context to disengagement theory which may be in fact solely a function of American culture (Rose, 1964).

Theoretical Framework of the Aging Process

Defined, senescence is a process of progressive and unfavorable organic changes usually correlated with the passage of time (Prehoda, 1968:249). Another definition commonly used for the aging process is the irreversible diminution of the ability of an organism or of one of its parts to adapt to the environment with the passage
of time. This is more commonly spoken of as a diminution of the capacity to withstand stress (Prehoda, 1968:249).

Theories of aging. Various theories have been expounded to date concerning the etiology of the aging process. Most of these theories are reviewed below.

Cross-linkage theory. Johan Bjorksten proposed that aging is caused by a gradual but progressive chemical cross-linkage of large vital protein and nucleic acid molecules. Preliminary experimental evidence has shown that arteriosclerosis may be caused by such a cross-linkage (Prehoda, 1968:94). The heart muscle of males age 64-74 years exhibits a considerable amount of insoluble cross-linked molecules (Prehoda, 1968:99). Contributory factors such as radiation and chemical mutagens, act on the aging process by the liberation of free radicals and the promotion of cross-linking in cell constituents in the genetic pool (Comfort, 1964:235).

Cybernetic theory. Stable chemical portions of brain neurons undergo gradual physical and chemical changes with aging. These alterations, cause neurons to become less and less capable of coordinating adjustments to stress comparable to physiologic adaptations seen in youth (Prehoda, 1968:151).

Stress theory. "True age depends largely on the rate of wear and tear, on the speed of self-consumption . . ." (Selye, 1956:274). Throughout life each individual spends the given amount of adaptation energy that he inherited from his parents. Vitality can be withdrawn
and used-up, but cannot be replenished. The only control over vitality is the rate at which the adaptation energy is spent. Hans Selye advises, based on his stress theory, that "the intelligent thing to do is to withdraw generously, but never spend wastefully" (Selye, 1956:274). Premature aging is then due to the constant and eventually exhausting stresses of life.

Mathematical calculations state that death occurs when people become increasingly unable to withstand the stress of their environment (Curtis, 1966:15). Strehler (1962) believes that the ability to survive a challenge of stress depends upon two factors: (1) the absolute magnitude of the challenge, and (2) the magnitude of the resources available to the organism to offset the disruptive effects of the challenge.

**Cellular interaction theory.** This theory holds that senescence results from a complex series of chemical reactions resulting from a change which affects any one of the biochemical feedback mechanisms of the body. This occurs regardless of whether or not the change that takes place is related or unrelated to the initial causative event (Curtis, 1966:15).

**Collagen theory.** Collagen fibers composed of protein tend to shrink with time and suffocate the tissues they occupy. Eventually this hampers function to the point of insufficiency and tissue necrosis. Accumulation and shrinkage of collagen are responsible for the appearance of characteristic wrinkles in the aged (Curtis, 1966:16).
**Waste-product theory.** According to the waste-product theory, a build-up of intracellular and intercellular waste products causes interference of the functioning of organs and eventually death. The collagen theory is a special case of the waste-product theory (Curtis, 1966:16). A build-up of lipofusins, age pigments, within heart muscle cells (myocytes) is concurrent with a steady decline in cardiac output over increasing decades (Burch & Giles, 1971). An interesting note is that Sulkin and Srevanij (1960) were able to produce lipofusins in nerve cells of young rats by vitamin E deficiency and hypoxia.

**Somatic mutation theory.** Spontaneous mutations in somatic cells do occur. Once a mutation is formed it is perpetuated by cell division. Then the mutated cells become inefficient and senescent (Curtis, 1966:16).

**Autoimmunity theory.** Due to somatic mutation, some cells of the body become programmed to synthesize proteins which are immunologically different from the rest of the proteins in the body (Curtis, 1966:16). These proteins act as antigens in the body. Immune and anaphylactic reactions occur as a response to the invasion of tissues by foreign protein.

**Calcium theory--Calciphylaxis.** Calciphylaxis, as a theory, proposes that calcium deposits and trauma play a unique role in the development of tissue senescence. Calcium deposits were produced experimentally in rats by the administration of large doses of vitamin D or parathyroid hormone. The deposits settled in soft
tissues. Trauma or injury in a given area resulted in a calcium deposit and rendered the tissue non-functional (Selye & Prioreschi, 1960).

**Integrated theory of aging.** Cross-linking of all types of molecules is assumed to be the major cause of aging. Cross-linkage is found to increase with stress. Further development and refinement of this theory is in progress at the United States Air Force Academy (Prehoda, 1968:195).

**Multifactorial genes.** Kallmann's twin studies (1948, 1951, 1952) have suggested that aging is a response to non-specific genetic factors such as multifactorial genes. For example, variations in graded characteristics such as stature, intelligence, and temperament are the result of multifactorial genetic activity.

**Viral aging.** "It is impossible at present, to eliminate the possibility that viruses may play a role in declining physiologic functions associated with aging" (Burch & Giles, 1971).

**Modifying the Effects of the Aging Process**

A number of treatments and techniques aimed at alleviating or obliterating the signs and symptoms of aging have been identified. For example, evidence indicates that a lack of niacin causes reversible changes in cell function which if unchecked could lead in a few weeks to irreversible changes in cell structure (Overholser & Fong, 1954:269). Moreover, it has been suggested that vanadium, a trace element, is capable of inhibiting the formation of cholesterol in the
body and may prove to be part of the enzyme that prevents arteriosclerosis (Prehoda, 1968:45).

Treatment to alter or impede the aging process ranges from minor efforts such as administering vitamin supplements, to highly sophisticated attempts at cellular engineering. For example, after the administration of vitamin E and A supplements combined, aged persons acquired a surge of strength along with a disappearance of overall weakness, headaches, facial wrinkles, and somniac problems (Prehoda, 1968:42). Whether these effects are short termed or long-ranged was not stated.

According to Cristofalo (1970:113) senescent cells are incapable of division due to an inability to initiate the synthesis of DNA (deoxyribonucleic acid). Also the RNA (ribonucleic acid) content of aging cells is disproportionately increased. Cristofalo (1970) explained that age-related damage to the sites and mechanism of RNA synthesis causes production of defective RNA which in turn produces defective protein.

To counteract the effects of these cellular changes, Niehans (1960) has been experimenting with a procedure called "cellular replacement therapy." This therapy is defined as "a method of treating the whole organism on a biological basis, capable of revitalizing the human organism with its trillions of cells by bringing to it those embryonic or young cells which it needs" (Niehans, 1960:9). Thus, for each impaired organ, corresponding cells from a healthy organ are introduced.

In summary, both the theories and experimentally proposed treatments for the aging process vary in complexity. It is evident
that no single, holistic theory of aging is yet possible. Continued research, observation, and experimentation will undoubtedly uncover the cause of the aging process, making modification of its effects possible.

AGING AND SENILE DEMENTIA

One of the most striking disorders often accompanying the aging process is senile dementia. Sometimes referred to as senile psychosis, this disorder attacks the nervous system, especially the brain. Personality and intellect are consequently affected.

Senile dementia, defined, is a disease characterized by a progressive loss of cells from the cerebral cortex of the brain. Cells lost are replaced by "senile plaques" and neurofibrillary structures (Isaacs, 1965:108). The disease presents itself as a psychiatric problem and warrants attention equal to its gravity.

Most usually the appearance of senile dementia halves the person's remaining expectation of life (Isaacs, 1965:108). Causation and pathophysiology are undetermined (Mayer-Gross, Slater, & Martin, 1969:609). Nevertheless, experimental studies continue to produce data in support of one etiological theory or another.

Clinical Aspects of the Disease

Susceptible individuals pass insidiously into senile dementia from normal old age without abrupt changes. Previous personality traits may become exaggerated. The course of the disease begins with a loss of memory and concentration, errors in judgment, impaired capacity for abstract thought, loss of mental flexibility and
adaptation (Isaacs, 1965:109). Progress leads to lack of interest and apathy, carelessness of dress and personal habits, disorientation in place, time, and persons, and emotional reactions such as depression, anxiety, and irritability (Butler & Lewis, 1973:76; Curran et al., 1972:122).

Disturbed sleep patterns occur frequently in the senile demented aged (Mayer-Gross, Slater, & Martin, 1969:607). Also observed are gaps in memory for daily events which may or may not be "covered up." If such a facade is seen, it most likely occurs in individuals with a high level of intelligence and socio-economic status (Mayer-Gross, Slater, & Martin, 1969:609).

Impairment of the control of sphincters occurs early in the course of the disease (Mayer-Gross, Slater, & Martin, 1969:608). Also in the early stages deviant forms of sexual behavior such as exhibitionism, may occur due to a combination of disinhibition, loneliness, absence of normal means of gratification, and impairment of the finer sensibilities (Mayer-Gross, Slater, & Martin, 1969:608). This type of behavior, however, is considered by some authors to be rare (Curran et al., 1972:122).

Two to three years after the first symptoms have appeared, the afflicted individual appears "blunted, apathetic, physically feeble and shrunken" (Mayer-Gross, Slater, & Martin, 1969:608). A sudden change in situation, for example, infection, fracture, or personal loss, causes proliferation of mental symptoms (Mayer-Gross, Slater, & Martin, 1969:607). Later in the course of the disease, signs of organic dysfunction are evident. These signs include:
(1) auditory and visual hallucinations, especially at night
(2) confused comprehension
(3) poor orientation for time, place, and person
(4) rambling and incoherent speech
(5) sleeplessness, restlessness, and wandering from the home
(6) paranoid tendencies which may lead to anger and violent attacks on family members, and

Larsson, Sjögren, and Jacobson (1963) have defined the course of senile dementia by three successive stages running over a few years. The first stage includes a gradual onset with increasing impairment of efficiency and memory. A steady, progressive, and irreversible decline of all personality functions marks the second successive stage. The final stage of the disorder is characterized by total helplessness, sphincter incontinence, and the preservation of vegetative functions only.

Classification. Senile dementia is classified as an organic brain syndrome. Organic brain syndromes can be either acute and reversible or chronic and irreversible. Senile dementia is a chronic brain syndrome, irreversible in nature. Organic brain syndromes are associated with impairment of brain tissue function. The distinct characteristics are (1) impairment and disturbance of memory, (2) impairment of intellectual function or comprehension, (3) impairment of judgment, (4) impairment of orientation, and (5) shallow or labile affect (Butler & Lewis, 1973:69).
There are three categories of behavioral reactions associated with organic brain syndrome. These include (1) reactions caused by the mental deficit itself, as in senile dementia, (2) emotional reactions and adaptations to the deficit, and (3) reactions called release phenomena, that is, the appearance of latent personality traits and tendencies that occur as a result of the brain damage (Butler & Lewis, 1973:70).

Pathological change. The brain pathology reveals variable amounts of atrophy; sulci widen and ventricles dilate. A profuse "outfall" of nerve cells can be seen microscopically (Mayer-Gross, Slater, & Martin, 1969:604). Senile plaques are present as well as neurofibrillary change and granulovacuolar degeneration. These changes are more severe in the anterior frontal layer than in the motor and posterior areas of the brain cortex (Mayer-Gross, Slater, & Martin, 1969:605). Other parts of the body's soft tissue may also atrophy (Butler & Lewis, 1973:76).

Diagnosis and differentiation. The characteristic age of onset of senile dementia is between 60 and 90 years of age, 75 years of age being the average (Butler & Lewis, 1973:76). The cardinal diagnostic feature of senile dementia is its "insidious onset" (Curran et al., 1972:123). Clinical findings "suggestive" of a diagnosis of senile dementia are as follows.

1. normal spinal fluid (usual finding)
2. altered electroencephalogram patterns which do not correlate with the degree of cerebral atrophy
(3) normal skull X-rays (usual finding)

(4) pneumoencephalography which reveals dilation of the lateral and third ventricles in the brain, widening of sulci and narrowing of gyri, which indicate cerebral atrophy, but not the specific nature of the abnormality (Barrett, 1972).

Senile dementia is an amnestic syndrome which presents itself as severe impairment of immediate recall, shortened retention span, disorientation, loss of recent and remote memories, and confabulations. This syndrome can be compared with normal aging in the following ways. First, both normal aged and diseased aged persons exhibit a slowing of mental processes and some forgetfulness. Each group has a decreased ability to adapt to rapidly changing situations, thus resistance to random stresses is reduced. In addition, both groups show atrophy of the brain with neuronal loss, senile plaque formation, and neurofibrillary degeneration (Kral, 1972).

The two groups differ in that not everyone eventually develops senile dementia. Incidence rates for institutionalized aged add validity to this statement (Kral, 1972). Another difference is that the incidence of the disease is considerably higher in women than can be explained by their greater longevity (Mayer-Gross, Slater, & Martin, 1969:607).

A differential diagnosis of senile dementia is difficult due to the existence of associated conditions and disorders. For example, some researchers believe Alzheimer's disease is an independent entity from senile dementia, while others believe it is an early stage of senile dementia (Lauter & Meyer, 1968). Alzheimer's disease is a

A very common mistake in diagnosing senile dementia is to confuse chronic brain syndrome due to arteriosclerosis with changes that are strictly "senile" changes and occur independent of arteriosclerosis. Arteriosclerotic brain disease may appear in the mid sixties, and begins abruptly. Those afflicted are often aware of loss of memory and confusion (Peck, 1970). There is also a better preservation of personality in arteriosclerotic patients (Mayer-Gross, Slater, & Martin, 1969:610). Senile brain changes, contrary to arteriosclerotic changes, occur gradually and without awareness of loss of mental capacity by the individual. The age of onset of senile dementia is most common at age 75 and not usually at 60 years of age, the common age of onset for arteriosclerotic brain disease (Peck, 1970).

In six different anatomical studies conducted between 1941 and 1965 it was found that arteriosclerotic brain disease and senile dementia occur concurrently in 50% of autopsies (Lauter & Meyer, 1968). Difficulty in diagnosis is further intensified by the common presence of depression in older persons. Post (1972) observed a relationship between loss of a parent during adolescence and depression in later life. Precipitating factors also found in 78.3% of patients were the loss, or threatened loss of a person, bereavement, removal or severe illness of a significant other, and related
psychogenic factors such as retirement, loss of home, and various
disappointments. It is indeed important to distinguish between
depression and senile dementia, for the latter is not associated with
an augmented suicide risk, whereas the former is (Larsson, 1968).

Distinguishing between depression and "senility" can be
achieved by making the following observations (Rosenthal, 1970).

(1) A senile person exhibits a loss in abstract intellectual
functions and would be inclined to interpret a proverb literally
rather than figuratively.

(2) A senile person usually does subtraction problems slowly,
if at all, and makes frequent mistakes.

(3) A senile person rarely loses the sense of "who he is."

(4) A senile person is not inclined to probe into his feelings
or attempt to express them.

(5) Senile dementias tend to laugh or cry without cause and
change between apathy and irritability.

If these signs are not present, the aged person is most likely
depressed and not senile. Indeed, one-fourth of those over 60 years
of age admitted to mental hospitals are suffering from treatable
depressions (Curran et al., 1972:123).

Further differentiation should be made from a diagnosis of
"simple senility," that is, non-psychotic organic brain syndrome,
which usually occurs after physical illness, or other environmental
stress. This condition begins abruptly and within a week to a month
after onset of the predisposing stress, the individual is in need of
external support. Studies by Feldshuh et al. (1973) at Bellevue
Hospital Psychiatric Division in New York have shown that treatment of the primary illness often results in the amelioration of "simple senility."

**Prognosis.** Senile dementia is a "terminal generalized disorganization of the personality in all its aspects" (Mayer-Gross, Slater, & Martin, 1969:609). The course of the disease is from four to six years (Isaacs, 1965:108). Hospitalization is usually prompted by an acute flare-up of delirium or confusion. The history of the disease before hospitalization has usually been a year to two and a half years in duration (Mayer-Gross, Slater, & Martin, 1969:609). The mortality rate for those presenting delirium on admission is usually very high (Curran et al., 1972:124). In fact, six months after admission to the hospital 60% of these patients die; in eighteen months 80% are dead (Mayer-Gross, Slater, & Martin, 1969:609). Roth (1955) estimated that after two and a half to three years 90% of all cases hospitalized with senile psychosis expire.

Death usually occurred after an intercurrent infection, an injury, or fall, or from a process of "vegetative extinction" characterized by falling weight, declining activity, and lowering of temperature and blood pressure (Mayer-Gross, Slater, & Martin, 1969:609). Once a senile dementia patient begins to deteriorate, he tends to do so faster and faster. Such a state is defined as "galloping senility" (Curran et al., 1972:124).

In comparison with other psychiatric diagnoses, Birkett (1972) found that senile dementia patients have a higher mortality rate due to pneumonia. Similarly, Daniel (1972) found that 27% of senile
dementia patients died from respiratory disease, the highest percentage of death from respiratory disease in all psychogeriatric admissions. Cardiovascular disease, however, ultimately claims the lives of almost 60% of all senile dementia patients.

**Demographic and Epidemiologic Variables**

Numerous investigations have been conducted to uncover regularities in the occurrence of senile dementia. Controlled studies provide quantitative data about variables associated with the disease. Accordingly, correlations and statistical inferences have been drawn in three related areas: (1) morbidity, mortality, and incidence, (2) constitutional variables, and (3) situational or environmental variables.

**Morbidity and mortality.** An "aggregate" morbidity risk for senile dementia was estimated by Larsson, Sjögren, and Jacobson (1963). The results taken from a study done in Stockholm in 1963 show that morbidity risk for senile dementia greatly increases with age.

<table>
<thead>
<tr>
<th>Age</th>
<th>Aggregate Morbidity Risk Up To the Age Stated (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>0.12</td>
</tr>
<tr>
<td>70</td>
<td>0.40</td>
</tr>
<tr>
<td>75</td>
<td>1.20</td>
</tr>
<tr>
<td>80</td>
<td>2.50</td>
</tr>
<tr>
<td>85</td>
<td>3.80</td>
</tr>
<tr>
<td>90</td>
<td>5.20</td>
</tr>
</tbody>
</table>

**Source:** Data taken from Larsson (1968:44)
Furthermore, Larsson (1968) noted a very high excess mortality among persons afflicted with senile dementia. The life-expectation quotient (the observed remaining mean expectation of life at onset of senile dementia as compared with the corresponding expectation for a person of the same age in the general population) is about 50% for males and 55% for females. Kay (1962) reported similar findings. For hospitalized patients with senile dementia, the life-expectation quotient, one year after hospitalization, is less than 40% (Larsson, 1968).

Table 2

Life-table Expectancy for Senile Dementia
Calculated for a Stationary Population

<table>
<thead>
<tr>
<th></th>
<th>1.8% males</th>
<th>2.1% females</th>
</tr>
</thead>
<tbody>
<tr>
<td>at birth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at age 60</td>
<td>2.2% males</td>
<td>2.4% females</td>
</tr>
</tbody>
</table>

Source: Data taken from Larsson (1968)

Both the life-expectation quotient and the life-table expectancy indicate that females have a lower mortality rate than males from senile dementia.

A five year study of 693 psychogeriatric patients revealed that the highest mortality rate for senile dementia is in groups aged 80 to 84 years. This study also evinced a preponderance of females over males as having senile dementia upon hospital admission. Females
comprised 63% of diagnosed cases, whereas males only totaled 37% (Daniel, 1972).

Other investigators and clinicians have expressed a similar morbidity and mortality finding, that is, a preponderance of females in morbidity as opposed to greater mortality rates for males (Isaacs, 1965:107; Brand & Gorwitz, 1971; Aldrich & Mendkoff, 1963; Kral, 1972; Roth, 1965; and Mayer-Gross, Slater, & Martin, 1969:607). In addition to sex, race is an important variable to mortality from senile dementia, for it has been observed that the mortality rate for the white population is higher than for the non-white population in the United States (Brand & Gorwitz, 1971).

**Incidence and prevalence.** The incidence statistics for senile dementia were combined in the literature almost always with arteriosclerotic psychosis data. Nielson's data (1968a, 1968b, 1968c) reflect this tendency. In 1958 the County of Arhus, having a population of 220,000, experienced an incidence rate for senile dementia and arteriosclerotic psychosis of 9.2 for each 1,000 inhabitants. Age-correlated statistics gathered by Ciompi (1968) show that the percentage of individuals with serious deterioration increases with age. Furthermore, this percentage is greater in women than men.

Akesson (1969) also found that incidence increases with age. The overall incidence for both sexes combined for senile psychosis was $0.38 \pm 0.10\%$. For males alone, the rate was $0.24 \pm 0.11\%$. Females showed a rate of $0.52 \pm 0.16\%$. 
Table 3
Incidence of Senile Dementia
In Various Age Groups

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 - 75</td>
<td>0.09%</td>
</tr>
<tr>
<td>70 - 80</td>
<td>0.56%</td>
</tr>
<tr>
<td>80 and over</td>
<td>1.37%</td>
</tr>
</tbody>
</table>

Source: Data taken from Akesson (1969)

With age, the prevalence of senile dementia increases, as does the morbidity and mortality for the disease (Akesson, 1969).

Table 4
Prevalence of Senile Dementia
In Various Age Groups

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>70 - 80</td>
<td>0.98%</td>
</tr>
<tr>
<td>80 and over</td>
<td>3.89%</td>
</tr>
</tbody>
</table>

Source: Data taken from Akesson (1969)

After extensive studies Kay et al. (1964) observed an overall prevalence rate of 6% for senile dementia in persons over 65 years of age, a much higher rate than that reported by Akesson.

Additional variables examined in Akesson's (1969) investigation of senile psychosis generated the following conclusions.
(1) Birth order does not differ from the predicted norm.

(2) The mean maternal age does not differ significantly from the predicted norm.

(3) There was no difference from the standard population in twin birth or first-cousin marriages among the parents of those afflicted.

(4) Parents and siblings of subjects with senile psychosis are much more apt to be similarly affected than the standard population.

Constitutional variables. Larsson, Sjögren, and Jacobson (1963) investigated the incidence of all forms of mental disorder in the parents, siblings, spouses, and children of 377 "probands" with a diagnosis of senile dementia. The findings suggest no enhanced morbidity risk for other psychoses, and consequently, no etiological connection between senile dementia and other mental diseases. The findings did show, however, that siblings, parents, and children of their subjects have a "morbid" risk for senile dementia, 4.3 times greater than that in a corresponding segment of the general population. Moreover, Larsson (1968) and associates did not find any "intermediate" forms between senile dementia and normal aging in the unaffected siblings and children of their probands.

As a result of these observations, Larsson, Sjögren, and Jacobson (1963) concluded that a major autosomal gene with partial penetrance is likely to be responsible for the disease. In other words, a monohybrid autosomal dominant gene could be the agent. The frequency of this aberrant gene in the general Swedish population was assessed at about 12%. 
To further support Larsson's conclusion, Kallmann's studies (1941, 1952) on senescent twin pairs showed that 8% of dizygotic twin pairs were "concordant" for senile psychosis. Monozygotic twins were concordant in 43% of the pairs studied. Constantinidis (1968) collected data from all relatives of patients with senile dementia, hospitalized and at home. The data show the morbidity risk of senile dementia, both certain and probable, reaches 7.96% among siblings, and 8.88% in the parents.

Somatic disease. Although somatic disease is implicated in the hospitalization of individuals with senile dementia, Larsson's (1968) data offered no grounds to support a conclusion that somatic disease is of any significance for the onset of senile dementia. Non-psychotic organic brain syndrome, on the other hand, has an abrupt onset with precipitating physical illness or injury (Feldshuh et al., 1973). The two disorders, non-psychotic organic brain syndrome and senile dementia, are distinguishable nosological entities. Whether one form is the precursor of the other, has not been reported in the literature available at this time.

Situational variables. Social, cultural, and environmental factors interact with every disease process in one way or another. For example, deteriorated old people in the community and senile dementia patients in the hospital, show a greater propensity to belong to lower socio-economic groups than their normal peers (Post, 1965:76). Haberman (1970) surveyed a community to retrieve data on the variables related to high "psychiatric symptom scores." The results indicated
that high symptom scores are positively related to older age, and to the female sex. Symptom scores varied indirectly with education and family income. Additional results revealed that those previously married and currently "single," score high in the number of psychiatric symptoms.

Personal habits have been examined as to their relationship to mental disease. For instance, Brock et al. (1972) reported that female subjects age 65, 70, and 75 years, living on welfare in Mainz, Germany, show no significant relationship between mental health levels and the degree of cleanliness or personal hygiene. Albeit, correlations were present between cleanliness and physical ailment, as well as cleanliness and cerebral sclerosis.

Marital status. Epidemiologic studies reveal marital status to be a highly correlated variable of senile dementia. Data from the 1966 census in Queensland, were collected and analyzed by Daniel (1972). The results showed that the hospital admission rates for senile dementia vary for married, separated, widowed, divorced, and single persons, as well as for sex.

The data show a much higher proportion of unmarried senile dementia patients in comparison with the census figures of the total population. Moreover, the greatest disparity between census data and the percentage of patients admitted to the hospital for senile dementia is observed in the "single" group. The widowed group shows the second greatest percentage of disease. Overall, single females and widowed males appear to be the two groups most affected by the disorder as reported by Daniel (1972).
### Table 5
Marital Status of Females with Senile Dementia And Females in the General Population (Queensland)

<table>
<thead>
<tr>
<th></th>
<th>Married</th>
<th>Separated</th>
<th>Widowed</th>
<th>Divorced</th>
<th>Single</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent admitted with senile dementia</td>
<td>13</td>
<td>2</td>
<td>68</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Percent in census</td>
<td>35</td>
<td>2</td>
<td>51</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Source:** Data taken from Daniel (1972)

### Table 6
Marital Status of Males with Senile Dementia And Males in the General Population (Queensland)

<table>
<thead>
<tr>
<th></th>
<th>Married</th>
<th>Separated</th>
<th>Widowed</th>
<th>Divorced</th>
<th>Single</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent admitted with senile dementia</td>
<td>33</td>
<td>3</td>
<td>45</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Percent in census</td>
<td>66</td>
<td>3</td>
<td>18</td>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>

**Source:** Data taken from Daniel (1972)
Similar data were gathered by Larsson (1968), who likewise concluded that there is an increased hospitalization risk for persons who are "isolated," that is, single persons as opposed to married, and childless as opposed to parents. Single status was used as an index of isolation in Larsson's studies (1963, 1968). Post (1965:76) carried this issue further by generalizing that "people who fail to get married have frequently been shown as unduly prone to all kinds of psychiatric disturbances."

Recent data in the United States show that throughout adult life, outpatient psychiatric admission rates are higher for the unmarried than the married. During early adult life the separated/divorced group exhibits the highest rate of admission. The "never married" and widowed, consecutively, show the next highest rates. The lowest rates are observed in the married group (U.S. Dept. of HEW, 1973e).

Residence. The permanent residence of patients prior to hospital admission for senile dementia is most often the home. In fact, 65% of the patients admitted to the hospital in the Queensland study (Daniel, 1972) had been living at home before admission. Seventy-seven percent of the patients in convalescent homes, and 72% in church affiliated homes are eventually admitted to hospitals as psychogeriatric patients with senile dementia.

Profile of situational variables. Sociological factors which appear to predispose an individual to hospitalization for psychiatric illness of the senium include: low income, poor education, negro race, foreign birth, unmarried, living alone, and multiple dwelling
urban residence (Gruenberg, 1954). In addition, chronic brain syndrome patients are generally older, less well-educated, with a lower occupational background than their normal counterparts in the community. They are found most often living alone with few social contacts and plagued with diffused situational and somatic complaints (Fisch et al., 1968).

**Hospitalization.** Data specific to senile dementia and hospitalization were difficult to find, albeit overall data on psycho-geriatric admissions to mental hospitals were available. Based upon statistics taken from two separate periods, these data show that the admission of elderly persons to hospitals is increasing more rapidly percentage-wise than that of younger aged groups. Malzberg (1955) attributed this trend to a pronounced increase in involutive, senile, and arteriosclerotic illnesses. Similarly, when Jana (1973) reviewed the admissions to a geriatrics ward of a provincial mental hospital over a twelve year period, he found that by far the largest group of admissions was formed by patients with chronic brain syndrome and/or demented states.

**Sources of referral.** The National Institutes of Mental Health, Survey and Reports Section, has collected and interpreted data on variable psychogeriatric hospital admissions in the United States. One particular survey reveals that 13.7% of all patients admitted over 65 years of age are from intramural referrals. A breakdown of these referrals indicates that the General Medical Service and Emergency Service refer the majority of patients. Extramural referrals are responsible for 86.3% of admissions age 65 and over. The private
psychiatrist initiates most of these extramural referrals, while self, family, and friend are the second greatest referral sources (U.S. Dept. of HEW, 1973c).

Description of hospital residents. In 1970 twelve percent of resident patients in state and county mental hospitals had organic brain syndromes associated with cerebral arteriosclerosis and senile brain disease. Fifty-two percent of residents age 75 and over were afflicted with these syndromes. The sex ratio (males per 100 females) for these disorders in 1970 was 55, a ratio which reflects the preponderance of females in incidence and morbidity ratings (U.S. Dept. of HEW, 1972)

Median days stay. Regardless of type of institution, the median days of inpatient psychiatric stay for those aged 65 and over was greater than all other age groups in 1970-71 (U.S. Dept. of HEW, 1973b). Broken down by sex, the median days of stay for females 65 years and over was 60 days, and for males the same age, 40 days. Between the ages 45-64, females had 45 median days of stay and males had 40 (U.S. Dept. of HEW, 1973d). Quite obviously, the sex difference for the older group is more pronounced. Females do have a higher rate of residency than males in mental hospitals both private, and state and county. This is especially true of females 65 years of age and over (U.S. Dept. of HEW, 1973f).

Racial and sexual distinctions in hospitalization. The hospital admission and discharge rates for those aged 65 and over vary with race and sex. In 1969 non-white males had the highest rate of hospital
admission. White males, non-white females, and white females ranked second, third, and fourth as far as admission was concerned (U.S. Dept. of HEW, 1971). Moreover, the percentage distribution of discharges for organic brain syndromes was greater for males than females. The overall discharge rates for hospitalized aged were 48.1% for males and only 23.0% for females (U.S. Dept. of HEW, 1973a).

**Discharge rates.** Statistics show that more than three-quarters of all senile dementia patients seen in one psychiatric ward of a University Hospital during a two year period were discharged within 30 days. The conclusion drawn from these data is that admission to a psychiatric ward of a general hospital for medico-psychiatric assessment of dementia is worthwhile (Wells & Liebowitz, 1972).

**Etiology**

The etiological factors of any disease are either proved or inferred by epidemiologic data. The exact cause of senile dementia is unknown, however, a number of biological, psychological, and situational correlates suggest a multiplicity of causative factors. There is no known pathogenic organism, no defined causative agent, but there do appear to be precipitating events and "predisposing" factors.

**Physiological factors.** Biological and genetic correlates to the etiology of senile dementia have been proposed in a number of studies. Larsson (1963, 1968), for one, implicated heredity in the causation of this disease. His epidemiologic investigations revealed a "morbid risk" among siblings, parents, and children of probands with senile
dementia. The suggested "agent" is a monohybrid dominant autosomal gene.

Further evidence to support the role of this gene as an "agent" was provided by Kallmann's twin studies (1948, 1951, 1952) which showed 8% concordance for senile dementia for dizygotic twin pairs and 43% for monozygotic twins. Bucci (1965) corroborated with these results by noting the regularity with which the disease affected several members of the same family in one or more generations.

In a chromosome study at Arhus State Hospital, Denmark, Nielsen (1968a, 1968b) discovered a high statistical significance for the percentage of hypodiploid cells in patients with senile dementia compared with a control group the same age (p < 0.001). These hypodiploid cells lack an X chromosome in the 6-X-12 group. Technically, Nielsen believes that this loss of a chromosome in females is a basic part of the etiology and pathogenesis of senile dementia. His reasoning is as follows. The chromosome loss results in an increase in mitotic non-disjunction, which presumably leads to an interference of metabolic functions. Moreover, chromosome lagging with loss of chromosome material found in female patients with senile dementia, would be, by experimental evidence, conditioned by a monohybrid autosomal dominant gene.

Difficulty in interpreting genetic studies is based on two factors as pointed out by Keddie (1967). First, the failure to trace forebears might indicate that they had died from other causes at an age before the senile disease took effect. Second, an "anticipation phenomenon" might exist whereby each generation would experience
symptoms earlier than the last. If present, this phenomenon would tend to increase the number of apparently "de novo" cases.

**Neurological changes.** A triad of increased senile plaque counts, neurofibrillary changes, and granulovacuolar degeneration is indicative of senile dementia. The actual cause of these changes is yet unknown, however, contributory factors have been suggested. Barrett (1972) gave a brief description of the anatomy of the suspected senile plaque. He described the central portion of the plaque as consisting of amyloid material, while the peripheral areas are composed of degenerated neuronal and glial processes.

By pathological means Tomlinson and Kitchener (1972) discovered that granulovacuolar degeneration of hippocampal pyramidal cells, rarely observed in subjects below the age of 60 years, was found with increasing frequency above the age of 60. Above the age of 80 this condition was present in 75% of cases studied. In non-demented aged subjects such changes occur in less than 9% of vulnerable brain cells, whereas senile psychotics exhibit granulovacuolar degeneration in about 10 to 50% of susceptible cells.

Additional controlled laboratory studies by Tomlinson et al. (1970) revealed that cases of progressive senile dementia exhibit widespread severe or moderately severe senile plaque formation, and neurofibrillary changes throughout the brain cortex. Pathological studies conducted by Corsellis (1962) concurred with the direct increase of senile plaques with age, such that at 90 to 94 years of age only an exceptional patient is spared.
The association between quantitative measures of dementia and qualitative senile change in elderly subjects was investigated by Blessed et al. (1968). The results of this research were statistically significant. A dementia score correlated to a highly significant degree with a mean plaque count ($r = +0.77, p<0.001$). A psychological test score correlated inversely with mean plaque counts ($r = -0.59, p<0.001$). In other words, the intensity of senile plaque formation judged by mean plaque counts, proved to be significantly correlated with scores on psychological tests and a clinical diagnosis of senile dementia.

Studies by Roth et al. (1967) of microscopic fields from various parts of the brain proposed a highly significant correlation between degree of mental impairment and number of senile plaques in elderly subjects. However, Lauter and Meyer (1968) have pointed out that senile plaques as morphological findings are not age-specific. Plaques are seen in mongolism (Down's syndrome), amaurotic idiocy, cerebral injuries, and even in infancy. Lauter and Meyer suggested that such changes are "one cerebral reaction form, which can appear wherever nerve cells atrophy either due to exogenous or endogenous processes."

It does appear from all available evidence that mongoloids have a definite predilection or predisposition to the type of "aging" common to senile dementia (Solitaire & Lamarche, 1966). However, a review of the literature conducted by Feldman et al. (1963) failed to show any case where families with mongoloid individuals had senile dementia.
The relationship between dementia score and mean plaque count in 60 brains post mortem.

Figure 1.

The relationship between test score and mean plaque count in 60 brains post mortem.

Figure 2.

Source: Blessed et al. (1968)
Results of psychological investigation are discordant with the assumption that senile dementia is only an accelerated and intensified senile involution (Lauter & Meyer, 1968). Roth (1972) proposed that a "threshold effect" is most likely involved in the clinical syndrome of dementia. He suggested that this effect may appear only after pathological changes in the cerebrum, measurable by plaque counts, develop beyond a certain point. A threshold effect could explain the "rapid, step-like deterioration" that is observed frequently in the elderly after years of mild, slowly progressing, or stationary defect of memory for recent events. Also an accentuation of lifelong personality traits is prompted at the threshold level.

Up to a certain point, structural damage that destroys portions of the brain may be accommodated within a reserve capacity of neurons. Overt evidence of intellectual impairment or personality deterioration does not become apparent if this reserve capacity is available. Roth (1972) suggested that any trauma, illness, or environmental element that leads to brain damage at any time in life, will predispose to senility in later life.

Furthermore, Dobbing and Widdowson (1965) discovered that severe undernutrition, a biological trauma, occurring during certain critical phases of development, that is, when there is a spurt in brain growth, tends to give rise to permanent deficits in the size and composition of the brain. Similarly, Corsellis and Brierly (1959) observed that progressive "dementia" occurs following cerebral trauma and is frequently associated with extensive plaque formation and neurofibrillary change. "Punch-drunkleness," a syndrome of boxers who
have sustained trauma to the brain, is seen as a "dementia" which continues many years after the "boxing" trauma has ceased (Critchley, 1957). The dementia cited in these two studies is not senile dementia per se, but it does have similar morphological characteristics and could be a predisposing factor to senile dementia, assuming Roth's proposal is valid.

**Biological correlates.** An impoverished cerebral blood flow is believed to be the cause of the symptoms of senile dementia. Symptoms have been improved experimentally by alleviating this circulatory deficit (Walsh, 1969). Nutrient deficiency is also linked to the development of the disease. Evidence has been presented which shows that lack of niacin (nicotinic acid) causes reversible changes in cell physiology which may eventually, in a matter of weeks, lead to irreversible changes in structure (Overholser & Fong, 1954:269). A deficiency of niacin is responsible for neurological symptoms which include confusion, dizziness, poor memory, and irritability. Hallucinations, delusions of persecution, and dementia are noted in cases of severe deficiency over an extended period of time (Robinson, 1970:177).

Biochemical changes common to autoimmunology have likewise been associated with cellular destruction. Test results have been consistent with an hypothesis that chronic brain syndrome may be associated with an autoimmune mechanism. More specifically a substance known as anti-CNS ab has been found in high titers in sera of patients with chronic brain syndrome. Anti-CNS ab is a circulating antibody predicted to cause an immune attack on the central nervous system resulting in diffuse brain damage (Tkach & Hokama, 1970).
Genetic correlates have also been recorded in the literature. In a study of serum haptoglobin types, Op den Velde and Stam (1973) observed a significantly increased Hp1 gene frequency in senile dementia subjects.

Psychological deterioration. In addition to an individual's inherited and constitutional traits, the personality influences the kind and severity of "senile" symptoms in the aged. In fact, only 30 of 79 consecutive hospital admissions for senile dementia had had normal previous personalities (Post, 1965:68). Some clinicians feel that a "pronounced" emotional reaction in a senile psychotic patient is indicative of minimal brain damage because the individual possesses enough mental resources to concentrate and elaborate on such a response (Butler & Lewis, 1973:70).

Moreover, emotional problems in the aged, not resulting directly from organic change, are "reasonably assumed" to have originated in middle age and to have become aggravated with age (Smith, 1967). Indeed, the clinical effect produced by any given lesion is dependent upon the capacity of the personality to compensate for the brain damage present (Rothschild, 1956).

Post has suggested that senile dementia, the disease, "may be a condition separate from senile intellectual deterioration" (Post, 1968). For it has been observed that elderly persons become confused and present a psychiatric problem following the death of their spouse, change in access to their children, or other changes at home. These factors are said to precipitate the outward symptomology of a dementia already in progress (Post, 1965:71). Such individuals most likely had
previous personality weakness and character disorders, and had responded to earlier stresses in life with minor and major psychiatric symptoms. As a result, positive psychotic symptoms are more prominent in later life (Post, 1965:67-68; Kral, 1970; Kral, 1973).

Senile dementias with ill-adjusted personalities, and disorders of mood and behavior are more likely to end up in mental hospitals than old people with lovable personalities. In cheerful, optimistic, and outgoing personalities dementia is characterized by euphoria, restlessness, a certain degree of aggressiveness, and exaggerated activities such as pottering, and hiding and hoarding of worthless rubbish (Post, 1965:68).

**Intellectual decline.** Whereas personality traits affect the kind and severity of symptoms of senile dementia, intellectual capacity is affected by the disease process itself. Senile dementia patients suffer from a learning deficit manifested in a regressive memory loss. That is to say, well-learned material (for earlier events) is retained, while material which is not well-learned (for recent events) is forgotten (Caird, 1966). A fear of the present motivates the recall of remote events moreso than recent ones. This fear is most likely based upon an attitude of uselessness and debilitation coupled with the anxious anticipation of increasing disability and death in the immediate future (Morgan, 1967).

**Situational influences on the dementing process.** The senile syndrome results from a combination of loss of brain function and external stress. Isolation from stimulating people and surroundings has been
noted to hasten the deterioration of the demented (Eaton & Peterson, 1969:27). In fact, Aring (1957) believed isolation in general to be an important cause of senility.

Among the factors responsible for isolation is mandatory retirement at age 65. Retirement stimulates "disengagement" in the aged, and as a result heightens this group's isolation from society. In a study done by Larsson, Sjögren, and Jacobson (1963), isolation due to single status was associated with increased hospitalization for senile dementia. According to Aring (1957), social isolation combined with a diminution of the senses, sight and hearing, referred to as "proprioception," causes impaired thinking, altered emotional response, hallucination, and changes in the electroencephalogram.

The findings of Kay (1964) reaffirm that social isolation is characteristic of elderly, demented patients. He alluded that in a few cases isolation could be a contributory factor in that it could add to depression, which itself is likely to cause increased deterioration in the mental state by contributing to self-neglect and dietary inadequacies.

**Cultural variables.** That cultural variables interact with all other variables in predisposing the aged to senile dementia is suggested in the literature. For example, Aring (1972) pointed out the difference between Western and Eastern philosophical orientations. Eastern "thought" encourages the continuing development of the inner self; wisdom and inner spirituality are highly valued. On the other hand, Western attitudes tend to threaten emotional health by their emphasis on materialistic goals. In addition to a stress on
"increasing gross national product," an overall anti-intellectual orientation inflicts undue insult on the elderly in Western society.

Social variables. Changes in the American family structure have had and still are having their effects on the aged. For instance, the disintegration of the extended family, which occurred toward the end of the 19th and the beginning of the 20th century, has lead to a reduction in status of the elderly (Aring, 1972). Also important is the resulting lack of emotional and financial security afforded the elderly in the extended family situation.

The individual's capacity to withstand any of the stresses reviewed above is dependent upon four factors as outlined by Peck (1970).

1. Genetic endowment, individual constitution, physical and psychological,
2. Personality, the behavior resulting from the interaction of constitutional endowment with the environment,
3. Physical functioning, including the brain, and
4. Social environment, that is, attitudes, and behavior of persons intimately involved in the life of the aged individual.

Pearce and Miller (1973:13) concluded in a recent paper that social problems in themselves are more often the sequelae than the cause of senile dementia. Albeit, he did propose that their existence may well serve to aggravate the overall disability.


Treatment and Management

The treatment and management of senile dementia was divided in the literature into three main approaches: (1) somatic therapy, (2) sociotherapy, and (3) psychotherapy. Sociotherapy and psychotherapy, grouped together in this review, include all situational forms of therapy aimed at altering the psychological aspects of the disease, including environmental manipulation. Somatic therapy includes a review of treatment for the physical manifestations of the disease. In addition, a few factors dealing with the hinderance of proper treatment and management are included.

Management by environmental manipulation, sociotherapy, and psychotherapy. Whether or not hospitalization is beneficial to the management of senile dementia patients is an issue under dispute. Butler and Lewis (1973:188) advocated home care as the ultimate treatment. The advantages to such care include:

1. More individualized care with familial involvement
2. Better morale of the elderly and a greater sense of security
3. Earlier intervention and treatment of the disease
4. Removal of the possibility of the aged person feeling punished for becoming ill
5. Creating a new health service industry, thus establishing a potential consumer market.

Haider (1967) discovered that out of 100 admissions to a psychogeriatric unit of Severalls Hospital, Colchester, 24 were admitted primarily due to social and family problems, and another 9
purely for social reasons. What is needed, according to Haider, are services of local agencies and other voluntary organizations, and not hospitalization.

Contrary to these opinions, Isaacs (1965:111) proposed hospitalization for senile dement. Such patients, he suggested, benefit from removal from a tense home where fear, anxiety, and shame abound. His idea of hospitalization includes a relatively independent view of the patient in the hospital environment with no drug treatment, self-help in feeding and dressing, with group exercises and occupational therapy.

Donovan and his British colleagues (1971) believe that many of the elderly patients admitted to hospital assessment units could be ultimately discharged to their own homes or to ordinary local authority welfare homes. They concluded, however, that 50% of these patients do require continuing care because of the "dementing process." As a result, they suggested that such patients be placed in the domestic environment of a special residential home for the mentally infirm and not in a psychiatric hospital. According to Silverman (1971), such patients in residential care units should be attended by a family physician alerted to call upon other specialists for advice and consultation if needed.

Much emphasis has been placed on home care versus hospitalization, and on the assessment mechanism for determining which management environment is suitable. Psychogeriatric assessment units have been in existence in Essex, England for a few years. Arie (1971) believes these units should function as "secondary assessment" units, and that
the home should be the place of "primary assessment." Arie reasoned that disability in the elderly is rarely understandable except in terms of a balance between function and setting, and these two variables almost always must be assessed together.

Another, even more important factor to be considered before admitting an elderly demented patient to the hospital, is the risk involved in relocating such patients. In select cases, "transfer mortality" may result after relocation (Group for the Advancement of Psychiatry, 1971). Lieberman (1961) found that the death rate for the elderly demented was high shortly after admission to homes for the aged. Aldrich and Mendkoff (1963) observed an even higher mortality among elderly patients confined to mental institutions than those in old age homes. This death rate was higher for men than women. Even if the patient is fortunate enough to avoid a "transfer mortality" reaction, there are other harmful effects to which he is vulnerable, such as exacerbated anxiety, confusion, and depression (Group for the Advancement of Psychiatry, 1971).

Butler and Lewis (1973:257) have outlined a unique approach to the treatment of senile dementia. They stressed the importance of structuring a medically and socially prosthetic milieu. An environment of simplification, order, and the balance of care versus self-care is needed, in addition to a moderation in stimuli. Direct assistance to the patient is recommended in the form of recreation, and occupational therapy, along with the utilization of objects, personnel, and techniques. According to Butler and Lewis, it is often advisable to provide supportive individual and/or group psychotherapy for the patient and maybe even the family.
Geriatric psychotherapy, as viewed by Butler and Lewis (1973) must deal with grief and restitution from the loss of loved ones, uselessness felt from bodily dysfunction and disability, and guilt and atonement associated with reconciliations. Furthermore, the therapist must be aware of an elderly search for unexplored patterns of life, and a state of "elementality," that is, the simple enjoyment and tranquility of an "existential" living for the present. Also a sense of autonomy or dependence, and identity are influenced by a subconscious fear of death. Butler and Lewis (1973:232) did make one outstanding point regarding the value of psychotherapy for the aged. They noted that "therapy is a major source of knowledge as well as direct help to individuals."

Modern therapy techniques utilize a variety of methods ranging from confrontation to interaction. Self-confrontation techniques include telephone therapy, and the use of audio and video tapes, still and motion pictures, photo albums, mirrors, and tape recorders, all as memory aids. Group therapy methods include environmental manipulation and social integration. In group therapy, sociability and emotional catharsis are two main objectives; in the "institutional" setting management of behavior is the primary objective (Butler & Lewis, 1973: 235-236).

Institutional settings vary. Donahue (1968) proposed what he calls a therapeutic community for the treatment of the psychogeriatric patient. This consists of the organization of a skilled nursing facility into an unambiguous social structure. The control of anxiety producing factors in such an environment is prescribed by specific
role behavior other than that of patient. As a result of these manipulations, the entire staff itself becomes concerned with therapeutic rather than custodial care.

A number of researchers have been experimenting with age-integration therapy and its effect on interpersonal relationships among elderly psychiatric patients. Wax (1962) found that the frequency of interpersonal interaction among aged, psychiatric patients is relatively low. The fact that interaction is influenced by age-integration was proved by Kahana and Kahana (1970) who compared an age-heterogeneous group of psychiatric patients with patients in an age-segregated ward. Patients in the age-heterogeneous psychiatric hospital ward displayed an increase in interaction, affect, responsiveness to the environment, and tended to show less cognitive impairment at the end of a three week period than upon admission. On the other hand, patients in the age-segregated ward showed little change. Any change observed was a decrease in affect, interaction responsiveness, and mental status.

The presence of young patients constitutes a valuable resource to psychogeriatric medicine. With regard to this, the following observations have been recorded by Kahana and Kahana (1970).

1. Younger patients actively assisted the elderly in leaving the ward more frequently.

2. Low utilization of medical resources by the young permitted the elderly to use greater resources than otherwise possible.

3. Deviant behavior, for example, incontinence in the elderly, was tolerated more readily by staff and other patients where the elderly represented only a small segment of the patient population.
It was more feasible to offer special privileges to the elderly on a ward where only a few privileges were requested.

In general the presence of the young provided stimulation, set examples of interaction, and served as a catalytic agent, allowing social relationships among the elderly to develop.

Butler and Lewis (1972) in their review of "age-integrated life crisis group therapy" outlined the contributions elderly members offer to a group. These include (1) providing models for growing old, (2) sharing solutions for loss and grief, (3) showing creative use of reminiscence, and (4) establishing a sense of historic empathy with the younger members of the group.

Reinforcement theory has provided yet another means of therapy for the aged. Lindsley (1964) has developed a theoretical framework for the application of operant conditioning to elderly institutionalized persons. Reinforcement of behavior is achieved in this application by positive sanction.

Family therapy is a valuable adjunct to the treatment of the senile aged. Butler and Lewis (1973:239) pointed out the issues involved in such therapy which include (1) the need for responsible decisions about the elderly members, (2) handling feelings of guilt and abandonment experienced by the elderly, (3) resolving old family conflicts, and (4) the need for providing continued care and emotional involvement with the aged.

Sociotherapy, a readaptation of the mentally ill, is aimed at preparing senile dementia patients to return home upon improvement. If the condition of the patient is too serious to warrant a return home, the goal becomes one of maintaining and strengthening all
existing social values and preserving a degree of psychic and physical motility. Villa and Ciompi (1968) described three types of readaptive therapy: (1) ergotherapy, work therapy, (2) ludotherapy, treatment with games, and (3) kinesitherapy, a mobilization of muscles to create the psychological stimulation of recovered movements.

Cosin et al. (1958) determined that senile dementia patients, even those with minds heavily destroyed, responded to the simplest of occupational therapy activities. However, the effect rarely lasts long. Cowdry (1972:395) purports that the restoration and preservation of the personality can be achieved by fostering activities which bring about changes in behavior such as increased communication with others, intellectual activity, and improved personal habits.

**Somatic treatment.** Many factors, including the maintenance of general health, are described as somatic treatment. According to Villa and Ciompi (1968) the first concern with elderly demented patients is to treat organic impairment so as to strengthen physical functions and limit psychic disability. A number of organ systems are the object of this treatment.

For example, cardiovascular disorders are responsible for more than 50% of senile mental disorders. Drugs used to allay circulatory distress include digitalis and strophanthin, analeptic drugs which work on confusional states, apathy, delirium, and intellectual performance levels. Anti-sclerotic medications such as estrogen and acid phenylethylacetic, aimed at inhibiting cholesterol synthesis are sometimes valuable (Villa & Ciompi, 1968).
Cholesterol catabolism can be stimulated by the administration of iodine, often called the "old man's daily bread." Thyroid extracts or nicotinic acid (niacin) produce similar effects. In addition, heparin and coumarin, anticoagulants, are somewhat successful in preventing or lessening the extent of a cerebrovascular accident (Villa & Ciompi, 1968).

Certain gastrointestinal disorders can impair the condition of brain diseased elderly by causing dehydration. Dietetics is, therefore, an important point of interest in the overall treatment of the senile demented. Moreover, urinary tract infections, especially when chronic, should be treated judiciously because of their role in the inception of confusional states. Finally, locomotion disabilities should be noted and compensated for. It is a fact that accidental fracture of the thigh bone is a frequent cause of senile deterioration (Villa & Ciompi, 1968).

Maintaining the general level of health. Therapy to maintain the overall level of health is not only restorative, but also somewhat preventive. Vitamin therapy ranks high on the list of treatment substances. Vitamin C (ascorbic acid), in particular, plays an important role in cellular metabolism, the formation of collagenous tissue, blood formation, and the synthesis of corticosuprarenal hormone. In addition, this vitamin assists the body's defenses against infections and plays a catalyzing role in psychic activity (Villa & Ciompi, 1968; Pauling, 1970). Kubala and Katz (1960) reported that there is a direct relationship between the mean intelligence quotient (average IQ) and the mean concentration of ascorbic acid in the blood plasma.
Their findings suggest that "alertness" and "sharpness" are diminished by a decreased intake of ascorbic acid.

Cortiocosterone and adrenocortical extracts are used in the treatment of cerebral hemorrhage, hemodynamic disorders, confusional states, and fatigue. Androgenous hormones have a stimulating effect and act on basic metabolism and nitrogen balance. They also act on muscular formation and are thus capable of combating asthenia (Villa & Ciompi, 1968).

Tonic and stimulant medications contain coca, cola, iron and liver extracts associated with Vitamin B₁₂. Liver extracts are valuable antianemics, whereas, coca, cola, and iron are stimulants to the appetite. Magnesium, zinc, copper, and potassium are beneficial metallic elements in cells and should be kept at normal values in the body (Villa & Ciompi, 1968).

**Biologic treatments.** Biologic treatments offer a new frontier to the treatment of the senile demented aged. Villa and Ciompi (1968) reviewed a few of these biological engineering techniques, all of which are mostly experimental. For example in Filatov's method of biologic treatment, placental or amniotic extracts are lyophilized and administered by a parenteral route or in the form of implants.

Bogolometz serum and Bardach's orthobiotic serum are obtained by crushing cells from the reticular tissue of the spleen and of human bone marrow. These cells are injected into animals which then produce antibodies available for therapeutic use. Antibodies give rise to immunological defense reactions in the reticuloendothelial tissue, and function as vaccines evoking bodily reactions (Villa & Ciompi, 1968).
Embryonic therapy involves the use of embryonic juice containing growth trephine, obtained from chicken or bovine embryonic extracts. This growth trephine exhibits an apparent tonic effect and seems to possess the power to regenerate cells. Royal jelly, a metabolism modifier, has shown encouraging results on physical and psychic asthenia in some elderly patients. Also thalasotherapy utilizes treatment with heated sea water. The beneficial properties of this particular therapy are seen as a vasodilating effect on the skin, acceleration of oxidation, activation of cell exchanges and increased elimination of wastes (Villa & Ciompi, 1968).

Villa and Ciompi (1968) have not observed any lasting improvement with biologic treatments, and have noted that their action remains unspecific and variable. These facts in addition to the high cost of treatment, preclude the systematic use of biologic treatments in gerontopsychiatry.

Concentrated areas of research. Researchers have been studying the effects of various substances on the dementing process. One such substance is RNA. Cameron et al. (1963a, 1963b, 1963c) reported that RNA in a buffer solution administered to senile dementia patients with intellectual deterioration produced a change toward normality in the electroencephalogram and improvement in performance on a number of psychological tests including the Wechsler memory quotient and a counting test. The earlier stages of memory deterioration responded the best to RNA treatment. Nodine et al. (1967) observed, however, that oral administration of RNA (as opposed to injection) did not bring about improvement and reversal of senile dementia.
Experiments conducted in the Italian neuropsychiatric school by Monticone et al. (1966) and Sanguinetti and Zerbi (1964) show that two substances, citidin and uridin, two nucleosides derived from RNA, activate the biochemistry of the nerve cell. These two substances also facilitate the use of glucose at the cerebral level, enhance the recovery of motor functions, and improve the intellectual efficiency of patients.

The value of procaine in the treatment of geriatric patients is disputed. Aslan (1962) experienced "good" results with his "Romanian cure," the administration of procaine. To the contrary in a double-blind study May et al. (1962) showed that procaine had practically no effect when compared with NaCl injections.

Folic acid deficiency has been observed in almost 75% of all gerontopsychiatric admissions. Shulman (1967) reported that 82% of new admissions had low serum folate activity levels.

The rate of cerebral oxygen uptake varies with health and disease. It also varies with age. Lassen et al. (1960) noted that normal aged persons have an average value of cerebral oxygen uptake which is only 9% below the level of young adult subjects. Severely demented aged persons, according to Lassen, have the lowest values of cerebral oxygen uptake. These values range about 40% below young normal subjects.

Relevant to these findings Jacobs et al. (1969) carried out a systematic longitudinal analysis of aged patient behavior. Their results showed that psychological symptoms of dementia, such as memory loss and conceptual inefficiency can be improved by intermittent hyperoxygenation.
Further studies have been pursued along these lines. For example, impoverished cerebral blood flow with its consequent low level of cerebral oxygen uptake, is believed by Walsh (1969) to be a major cause of symptoms of senile dementia. He reported that symptoms can be improved by the administration of an anti-coagulant, Bishydroxycoumarin (Dicumarol). Such treatment is dangerous, therefore, Walsh suggested careful screening of patients, and using only those with early symptoms.

A surgical procedure to increase cerebral blood flow has been developed by Salmon (1969). This ventriculoatrial shunt procedure is a means of returning cerebrospinal fluid directly to the bloodstream. He postulated that a decrease in intracranial pressure to subnormal levels, the result of this procedure, brings about an increased blood supply to damaged neurons. Even though the primary disease process remained uninfluenced by the shunt, a range of no change to marked improvement in symptoms was observed in 79% of patients operated on. However, a 21% fatality rate was experienced.

**Tranquilizers for the aged.** Treatment with tranquilizing drugs appears to be standard for elderly psychiatric patients. Butler and Lewis (1973:257) recommended the use of minor tranquilizers for agitation. A trial study by Barton and Lindsay (1966) revealed that about 80% of elderly demented patients are receiving tranquilizers unnecessarily. This was true for those receiving continuous treatment as opposed to crisis treatment.

**Rehabilitation.** Some patients are ultimately discharged from psychogeriatric wards and sent home. Haider (1967) proposed that steps
be taken to safeguard a patient's home so that it is available at the
time of discharge. Apropos, emphasis was placed by Overholser and
Fong (1954) on encouraging the family to understand the aging person
and to adjust to his idiosyncratic forgetfulness, reminiscing, and
ultraconservatism.

The rehabilitation or reintroduction of physically or psychi-
atrically feeble geriatric patients into family and society represents
a border between somatic and psychiatric therapy. The problem of
death, however, which underlies all chronic diseases, must be dealt
with (Ciompi, 1966:27).

Inhibiting factors to proper treatment and management. Diffi-
culties in providing proper treatment for the senile demented aged
arise from family, physician, and paraprofessional attitudes. Rosen-
berg (1973) has accused some physicians of using "senility" as a
"wastebasket" diagnosis. Generally such an attitude means that aged
psychiatric patients will be denied effective treatment. Moreover,
negative attitudes of physicians who make a non-diagnosis of "senility"
with its attached stigma of hopelessness, may become communicated to
other staff members. McIver (1972) believes such a feeling of hope-
lessness may eventually pervade an entire institution and most probably
cause even further patient deterioration.

Another difficulty encountered in the treatment of the
psychiatric aged is the problem of attracting young physicians to a
geronto-psychiatric service. For this reason, Arie (1971) proposed
that future psychiatric services for old people should be based in
general hospitals.
PREVENTION OF SENILE DEMENTIA

Before developing the model for prevention of senile dementia, it was necessary to review the literature related to the principles of prevention, in both broad and specific terms. In addition, a survey of existing programs was included. The information gathered was quite limited, yet valuable as a point of intellectual departure.

Principles of Prevention and Program Development

Behind every condition of health or disease is the phenomenon of almost constant alteration. These conditions are continuing processes: a battle on the part of man to maintain a positive balance against biologic, physical, mental, and social forces tending to disturb his health equilibrium (Leavell & Clark, 1965:15).

Natural history of disease. Leavell and Clark (1965:17-19) have developed two concepts important to the field of preventive medicine. Both are based on the theoretical alteration of conditions and health equilibrium. The first is the Natural History of a Disease which consists of two periods, prepathogenesis and pathogenesis. Prepathogenesis consists of the preliminary interaction of the potential agent, host, and environmental factors which effect the production of a disease.

Pathogenesis refers to "the course of a disorder in man from the first interaction with disease provoking stimuli to the changes in form and function which result, or until equilibrium is reached or recovery, defect, disability, or death ensues" (Leavell & Clark, 1965:17). The two periods of the natural history represent the processes in the environment and those in man.
AGENTS
Biologic, Nutrient, Chemical, Physical and Mechanical
The balance is determined by nature and characteristics of these agents in relation to Host and Environment.

HUMAN HOST
Balance depends on age, race, sex, habits, customs, genetic factors, personality, defense mechanisms
Changes Upset Balance

At Equilibrium
Lever

ENVIRONMENT
The aggregate of all external conditions and influences affecting the life and development of an organism, human behavior, or society.

FULCRUM
Variable Fulcrum Position
Simplified illustration of factors, influencing health equilibrium.

Figure 3.

Source: Leavell and Clark (1965)
Levels of prevention model. The second concept developed by Leavell and Clark (1965) is the Levels of Prevention Model. There are three levels of application of preventive measures in the natural history of any disease. These levels consist of (1) primary prevention, (2) secondary prevention, and (3) tertiary prevention.

Primary prevention can be carried out by means of health promotion and specific protection. Health promotion includes all procedures which serve to enhance the general health and well-being. Such measures are not directed at any particular disorder or disease. Health education, motivation, a good standard of nutrition, optimal personality development, adequate housing and recreation are examples of health promotional activities (Leavell & Clark, 1965:20-22).
Specific protection refers to those activities aimed at intercepting causes of a disease or disorder before man becomes affected. Included in this category are: specific immunizations, attention to personal hygiene, environmental sanitation, protection against occupational hazards, protection from accidents, use of specific nutrients, protection from carcinogens, and the avoidance of allergens (Leavell & Clark, 1965:23).

Secondary prevention consists of early diagnosis and prompt treatment, and disability limitation. The objectives of early diagnosis and prompt treatment are to (1) prevent the spread of disease to others, if communicable, (2) cure or arrest the disease process so as to prevent complications or sequelae, and (3) prevent prolonged disability. These objectives are met through individual and mass casefinding measures, screening surveys, and selective examinations. Disability limitation includes the prevention or delay of the consequences that occur from clinically advanced disease. Specific goals are to limit disability, prevent death, and to provide treatment to arrest the disease process and prevent further complications or sequelae (Leavell & Clark, 1965:24-25).

The final level of application of preventive measures is tertiary prevention. The tertiary level consists of rehabilitation, the prevention of complete disability after anatomic and physiologic changes are more or less stabilized. This involves the maximum use of capabilities that remain after disease. Physical, mental, and social ramifications are associated with rehabilitation. In a broad sense, tertiary prevention includes selective placement, satisfaction
Levels of Application of Preventive Medicine

**Preventive Medicine** is the science and art of preventing disease, prolonging life, and promoting physical and mental health and efficiency.

<table>
<thead>
<tr>
<th>Groups and Communities</th>
<th>Individuals and Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organized Mass Action</td>
<td>Private Patient Care</td>
</tr>
</tbody>
</table>

PUBLIC HEALTH PRACTICE

Intercept the natural history of disease at any stage of its evolution.

---

**The Natural History of Any Disease of Man**

- Interrelations of Agent, Host, and Environmental factors to produce disease stimulus
- Pre-pathogenesis period
- Period of Pathogenesis
- Clinical horizon
- Recovery
- Disability
- Death

---

**Levels of Application of Preventive Measures**

- Health Promotion
- Specific Protection
- Early Diagnosis and Prompt Treatment
- Disability Limitation
- Rehabilitation
- Primary Prevention
- Secondary Prevention
- Tertiary Prevention

---

**Figure 5.**

Diagram Showing the Application of Preventive Medicine

**Source:** Leavell and Clark (1965)
of full employment potentials, and work therapy in hospitals (Leavell & Clark, 1965:26).

Specific Recommendations for Preventive Measures for Senile Dementia

Various researchers have proposed measures to attempt to intercept senile dementia. Peck (1970) believes all hope for intervention rests upon changing the human environment. Organizing the aged is Butler and Lewis' (1973:240) approach to altering the human environment. Four areas of organization were reviewed. First, is the creation of age awareness and acceptance such as to eliminate anxiety about identifying with aged groups. Achievement of this first objective should result in recognizing age, accepting it, and taking pride in it, and being able to empathize with others on common experiences.

The second area of organization is in mobilizing community resources in order to fabricate networks of care within the community. Included should be community mental health centers which provide outreach care for elderly patients. Eventually this mobilization should force the creation of organized sources of information and referral, for example, clearinghouses (Butler & Lewis, 1973:240).

Social and political organization are the third and fourth means recommended by Butler and Lewis (1973). Registration drives were proposed in order to recruit all those eligible for income and service programs. Present out-reach programs for the elderly include the National Welfare Rights Organization, Medicare Alert which registered elderly for Medicare B, and FIND (Friendless, Isolated, Needy,
Disabled) which prompted the study by the National Council on the Aging to show areas of need and poverty in the aged. The elderly constitute 17% of the voting population. Political organization for this group includes the National Council of Senior Citizens, the American Association of Retired Persons, both lobbying groups, and a smaller more militant group called the Gray Panthers (Butler & Lewis, 1973:242-245).

The most impressive suggestions as to the prevention of senile dementia came from Roth (1972). Prophylaxis according to his studies consists of preventing any injury which results in brain damage earlier in life. Furthermore, his findings suggest that insults to the brain from cerebrovascular accidents (strokes) should be minimized and reduced as a preventive measure. Hypertension, likewise, should be treated early so as to reduce the chance of cerebral hemorrhage. In addition early-life, cerebral trauma should be reduced, especially those injuries due to the "battered child syndrome," and also to lack of proper nutrition during pre-natal and early post natal development.

A reassessment of "old age" was advocated by Rudd (1959) as an approach to the prevention of senile dementia. He explained that the young tend to reject the elderly because of their age, and in due course come to experience the same attitude in their own old age, resulting in self-rejection which destroys psychological defenses used to protect self esteem. Lack of sympathy between the age-groups, and the apparent division of interests between them is a major cause of mental health problems, according to Rudd. His proposed solution to the problem includes a return to previous approaches to life, even
though they might be considered outmoded. He suggested that the value of the older worker has declined as a concomitant of a decline in craftsmanship. Advisory centers which would function to interpret the needs of the aged to the young and vice versa were recommended by Rudd.

Leavell and Clark (1965) have provided several specific recommendations for the application of preventive measures to the natural history of mental illness. Relevant health promotional activities include family life education, improved family relations, and personal counseling. Ewalt and Farnsworth (1963:185) add to this the provision of adequate housing and income. Specific protection against infection, and malnutrition is suggested, as well as crisis intervention and anticipatory counseling (Leavell & Clark, 1965:411-413). Ewalt and Farnsworth (1963:185) expand this recommendation to include planning for post-retirement careers and hobbies.

Early diagnosis and prompt treatment should be in the form of psychotherapy and somatic measures such as sedatives, tranquilizers, stimulants, anti-depressants, vitamins and hormones. Disability limitation is concerned with "social-breakdown syndrome," a term related to "asylum lunacy," and "institutional neurosis." This includes mental disorders accompanied by distortions of personality functions associated with more or less severe destruction of the patient's social relationships (Leavell & Clark, 1965:416).

The Committee on Aging of the Group for the Advancement of Psychiatry (1971) suggested that primary prevention should include the elimination of obstacles to receiving proper care, education of the aged in good nutrition, the provision of food stamps, and public
assistance to the poor. These recommendations include the delivery of services as a prevention activity, a new addition to the types of activity areas available to prevent disease. Furthermore, the Committee recommended the creation of an "advocate for the aged," a person or committee to speak up for the availability of excellent services.

A juggernaut to prevention. Post (1965:142) pointed out that persons with long-standing weakness of personality structure, lack inner strength and fail to build up good relationships which would offer emotional support in times of crisis. He added that such persons are usually too hostile and insecure to participate in any social activities or group projects. Important to note, according to Post, is that people on the "danger list" for emotional disorders in late life are unlikely to take advantage of preventive measures due to their personality make-up, regardless of how much they are publicized.

Models for existing programs. The literature is almost deficient in the area of existing prevention programs in psychogeriatrics. A few reviews, however, were significant and relevant. The Committee on Aging of the Group for the Advancement of Psychiatry (1971) outlined five conceptual models based upon public health approaches to major physical illnesses. These models appear below.

Supplies model--Illness is viewed as a result of a lack of "something," for example, vitamins, mothering figures, social roles, or opportunity for intimacy of the type found in family life.
Infectious disease model--illness is presumably caused by an agent spread through the community by infected individuals, for example, spirochete and syphilis, or cultural values surrounding drug abuse, considered to be "contagious."

Genetic model--During the 19th century this model was used exclusively for mental health. Schizophrenia, psychopathy, sociopathy, and sexual deviations were believed to be caused by an "inherited tendency toward degeneration."

Educational model--The deficiency of specific knowledge results in illness, for example, lead poisoning in children from paint, or ill effects caused by quack remedies.

Social systems model--Illnesses are seen as the inability of persons to cope with difficult life situations. Social systems refer to families, friendships, clubs, and medical and welfare systems, all of which can determine success or failure in an individual's attempt to cope with stress. Intervention approaches to improve these social systems include teaching the elderly leadership skills so they can intervene on their own behalf in systems that concern them.

The first four systems conceptualized are medical models; the fifth is a social systems model.
In San Mateo County, California, Downing and Goldfarb (1955) applied epidemiologic methods to a local mental health program. Program goals included (1) providing local alternative treatment approaches to the care of the severely mentally ill, (2) providing indirect consultative services to individuals of special local social concern, that is, criminal offenders, welfare clients, and the socially disadvantaged, and (3) promoting positive mental health in persons during vulnerable periods of life. An activity carried out to achieve this third objective was the addition of a Family Life Education sequence to the curriculum of all county schools in San Mateo, grades kindergarten through twelfth.

Leavell and Clark (1965:418-420) recommended a group of services which should be included in a program for the mentally ill. These consist of: case identification and referral, emergency services, diagnostic services, screening, a psychiatric hospital, day and night hospitals, outpatient clinics, clubs for former patients, family care and halfway houses, nursing homes, and vocational rehabilitation.

A comprehensive approach to the treatment and prevention of mental illness was suggested by Butler and Lewis (1973:190). Necessary to this approach are evaluations, treatment plans, and coordination of care by a responsible person or group. Butler and Lewis pointed out that at the present time public health nurses and social workers are two groups who routinely make house calls, therefore, they would appear to be the central coordinating figures in any plan for home care of the demented aged.
Methodological Needs

Three needs related to program development for psychogeriatric care and prevention were identified in the literature. First, Yudin et al. (1973) showed that there is a great need for continuing psychiatric consultation and the development of appropriate remedial programs that extend beyond custodial care. Secondly, Yudin found that formal evaluation of senile dementia patients is almost nil and theoretically impossible due to poor record keeping. Finally, Monroe et al. (1967) recommended the development of a continuing dialog between biometrists and administrators who are responsible for actual program planning.

Attitudes Toward the Prevention of Senile Dementia

Stieglitz (1954:27) believes that if during the years of age 40 to 60 health were maintained near optimum and degenerative diseases (particularly cardiovascular diseases) were either prevented or retarded, the likelihood of long disability, chronic illness, and uselessness after age 60 would be greatly reduced. If geriatrics is to be effective, Stieglitz proposed that an attitude of "prophylaxis" and "anticipation" is fundamentally essential.

Aring (1972) submitted that at this particular time in history, it would be best to devote our energies to the "nurture of graceful aging rather than to its delay." He explained that the accent should be placed on the growing and not the aging. A similar point of view was purported by Jana (1973). After reviewing patients admitted over a twelve year period to psychogeriatric hospital wards, Jana concluded
that the goal of geriatrics is one of care rather than cure. He believed emphasis should be placed not only on "how long one lives," but also on "how one lives long."

SUMMARY

The literature was reviewed in three selected areas. In the first part of this review, the aged population was described with demographic characteristics such as: age, sex, race, marital status, residence, geographic distribution, housing, income, and employment. In addition, observable characteristics describing the aged population included: physical changes, psychological changes, and situational variables. A survey of the theories for aging established a theoretical framework for defining the aging process itself. Finally, factors related to altering the course of the aging process were reviewed.

The second area of exploratory review focused on senile dementia and its relationship to the aging process. Definition of this disease was achieved by reviewing its classification, pathological characteristics, clinical features, diagnostic criteria, prognosis, and differentiation. A relationship to the aging process was inferred from epidemiologic data such as, morbidity and mortality statistics, constitutional factors and situational variables. Among the etiologic factors reviewed were: biological and genetic correlates, psychological deterioration, and cultural, social, and environmental influences. A survey of somatic therapy, sociotherapy, and psychotherapy, all forms of treatment and management, concluded this section.
The third part of the literature review was directed toward publications dealing with the principles of prevention and program development. For example, the concepts of the natural history of disease and levels of prevention were discussed. Specific recommendations found in the literature for preventive measures also were presented. Methodological issues were surveyed. These include utilizing and establishing resources, and identifying theoretical needs. Concluding statements of part three pertain to attitudes toward the prevention of senile dementia.
Chapter 3

RESEARCH METHODOLOGY

The methods utilized in this project primarily consist of:
(1) a review of the available literature, (2) derivation of a specific natural history pattern, (3) construction of a theoretical prevention model, and (4) exploration of the implications of such a model to activities in community health.

Review of the Literature

The search and retrieval of literature was conducted according to the following plan.

Journals and periodicals. A MEDLINE bibliography was obtained through the Reference Departments of California State University, Northridge, Science and Technology Library, and the University of California, Los Angeles, Biomedical Library on October 25, 1973. The search retrieved 111 citations for literature related to the prevention of senile dementia in the aged. Twenty-five citations were printed directly from the University of California, Los Angeles, Biomedical Library; the remaining 86 retrieved were off-line searches printed at the National Library of Medicine in Bethesda, Maryland. The MEDLINE files were searched for 47 months, January 1970 through November 1973. The data base for MEDLINE at the time of this search consisted of 1,262 journals indexed for Index Medicus.
A search through Psychological Abstracts for 8 years, January 1966 through April 1974, retrieved 70 journal citations. An additional 20 sources relevant to current statistics on the aged and mental illness were retrieved by a survey through the American Statistical Index, Part 2, Abstracts for 1973. Finally, a survey through A Classified Bibliography of Gerontology and Geriatrics, 1956-1961 by Nathan W. Shock (1963) provided a few additional sources of data unavailable through previous means of reference retrieval.

Book literature. Books were systematically selected based upon the relevance and validity of the data they provided. Recent publications were sought. However, earlier publications containing valuable historical perspectives and material fundamental to public health principles of epidemiology and prevention also were included.

Derivation of the Natural History of Senile Dementia

Leavell and Clark (1965:17-19) established a pattern for the historical course of any disease. This general pattern was used as a guideline to the development of a specific pattern for senile dementia. Data denoting the natural history of senile dementia were obtained from the available literature.

Construction of a Theoretical Prevention Model

A theoretical prevention model was constructed based upon the primary, secondary, and tertiary levels of prevention outlined by Leavell and Clark (1965:20-26). Activity areas applicable to each level of prevention were augmented in this project by five variables:
(1) physiological variables, (2) psychological variables, (3) situational variables, (4) conditions (pre-existing), and (5) needs.

<table>
<thead>
<tr>
<th>Activity Area</th>
<th>Level of Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td>Physiological variables</td>
<td>X</td>
</tr>
<tr>
<td>Psychological variables</td>
<td>X</td>
</tr>
<tr>
<td>Situational variables</td>
<td>X</td>
</tr>
</tbody>
</table>

Figure 6
Schematic for Derived Prevention Model

Definitions Relevant to the Model

(1) levels of prevention—were defined by Leavell and Clark (1965) as reviewed in this paper. They consist of primary, secondary, and tertiary levels.

(2) activity areas—were defined by Leavell and Clark (1965) as reviewed in this paper. The model for senile dementia makes use of the following activity areas.

Primary Level Activities

Nutrition                  General Level of Health
Health Education           Occupational Environment
Personality Development    Periodical Selective Examinations
Genetics                  Use of Specific Nutrients
Housing                   Crisis Intervention
Recreation                Protection from Accidents
Overall Living Conditions  Attention to Personal Hygiene
Secondary Level Activities

Individual and Mass Case-finding Measures
Screening Surveys
Selective Examinations
Treatment
Disability Limitation

Tertiary Level Activities

Rehabilitation

(3) conditions--include the presence of existing factors associated with a specific activity level.

(4) needs--point out requirements for additional factors associated with a specific activity level.

(5) physiological variables--refer to physical, biological, and chemical factors related to a specific activity level.

(6) psychological variables--refer to intellectual, emotional, as well as psychological factors related to a specific activity level.

(7) situational variables--refer to social, cultural, and environmental factors related to a specific activity level.

Undefined variables (designated by an X in the model) were supplied from the literature review. Consequently, lack of data relevant to an undefined variable was noted within the model as a deficiency in the literature.
Chapter 4

ANALYSIS

The data gathered in the survey of the literature were incorporated into an outline of the natural history of senile dementia. Based upon these data and the natural history, a prevention model specific to senile dementia was designed. Deficiencies in the literature were noted within this model as undetermined conditions or needs.

THE NATURAL HISTORY OF SENILE DEMENTIA

Sufficient data were obtained from the literature so that a complete history of senile dementia could be outlined. Both prepathogenesis and pathogenesis periods were traced from beginning to end. Inferential data were included, as well as generally accepted quantitative data.

Prepathogenesis

The preliminary interaction of potential agent, host, and environmental factors constitutes the course of prepathogenesis for senile dementia. As observed below, factors relating to the agent are somewhat inferential. On the other hand, host and environmental factors are based on statistical data generated from valid research studies.

Agent. No one agent or causative factor has been implicated in the etiology of senile dementia; however, a number of contributing factors
have been suggested. These include: (1) the aging process itself, (2) neurological pathology, (3) genetic inheritance, (4) stress, (5) social factors, such as isolation, (6) nutritional deficiency, and (7) autoimmune reactions.

**Aging process.** The theoretical causes of aging consist of genetic, neurological, chemical, and stress etiological components to senile dementia. Specifically these components include:

- genetic cross-linkage (Comfort, 1965:235)
- physical and chemical changes in neurons (Prehoda, 1968:151)
- the wear and tear of stress (Selye, 1956:274)
- defects in biochemical feedback mechanisms (Curtis, 1966:15)
- a build-up of lipofussins, waste products (Curtis, 1966:16; Burch and Giles, 1971)
- somatic mutation and multifactorial genes (Curtis, 1966:16; Kallmann & Sander, 1948)
- calciphylaxis (Selye & Prioreschi, 1960), and

**Neurological pathology.** Senile plaque formation and neurofibrillary changes throughout the brain cortex have been observed and linked etiologically with senile brain syndrome (Tomlinson et al., 1970). A direct increase in senile plaques with age was reported by Corsellis (1962). Barrett (1972) described the anatomical characteristics of the senile plaque. Blessed et al. (1968) correlated mean plaque counts with psychological test scores and a clinical diagnosis of senile dementia. A highly significant correlation between degree of mental impairment and number of senile plaques
in elderly patients was reported in the microscopic studies of Roth et al. (1967).

Genetic inheritance. A major autosomal gene with partial penetrance is suspected as one causative agent for senile dementia (Larsson et al., 1963). The frequency of this aberrant gene in a general population has been estimated at about 12% (Larsson, 1968). The twin studies of Kallmann (1951, 1952) showed that 8% of dizygotic twin pairs are concordant for senile dementia, while 43% of monozygotic twins are concordant. Increased morbidity risk among siblings and parents of patients hospitalized with senile dementia, further implicates a genetic basis for this disease (Constantinidis, 1968). Bucci (1965) noted the regularity with which several members of the same family in one or more generations were affected by the disease.

Nielsen (1968a, 1968b) recognized a high statistical significance for the percentage of hypodiploid cells in patients with senile dementia as compared with controls. Specifically his findings revealed that these hypodiploid cells lack an X chromosome in the 6-X-12 chromosome group. Any chromosome lagging with loss of chromosome material in senile dementia patients, as stated above, is considered by experimental evidence, to be conditioned by a monohybrid autosomal dominant gene.

Recently, Op den Velde and Stam (1973) observed a significantly increased Hp' gene frequency in senile dementia subjects. Results of this observation on serum haptoglobin types have yet to be corroborated in the literature.
Stress and trauma. Any trauma, illness, or environmental element that leads to brain damage at any time in life, will predispose to senile dementia in later life (Roth, 1972). Corsellis and Brierly (1959) observed that progressive dementia occurs following cerebral trauma. A syndrome found in boxers called "punch-drunkenness" is considered to be a dementia which continues many years after trauma to the brain (Critchley, 1957).

Cerebrovascular accidents, hypertension, and cerebral hemorrhage also contribute to insults to the brain. In addition, early life trauma, such as that seen in the "battered child syndrome," causes undue cerebral trauma leading to senile brain disease in later life (Roth, 1972).

Premature aging has been associated with the exhausting stresses of life (Selye, 1956:188). Emotional stress is combined with physical trauma. The effect produced by emotional stresses such as the death of a spouse, change in access to children, and other related changes at home, is one of the outward expression of a dementia already in progress (Post, 1965:71).

Social factors and isolation. Aring (1957) believes isolation in general to be an important cause of senility. That social isolation is characteristic of elderly demented patients was also supported by Kay's (1964) findings. In addition, Larsson et al. (1963) and Larsson (1968) found that isolation was associated with increased hospitalization for senile dementia. Gruenberg (1954) and Fisch et al. (1968) supplied further corroboration to the conclusions drawn by Aring (1957), Kay et al. (1964), and Larsson et al. (1963), Larsson (1968).
Retirement results in disengagement, a tendency to withdraw from the center of the stage of life (Isaacs, 1965). Both men and women identify retirement as disengagement (Crawford, 1971). Since retirement stimulates disengagement, it indirectly heightens isolation from society.

**Nutrition.** Severe malnutrition during certain critical phases of life (i.e., when there is a spurt in brain growth) tends to give rise to permanent deficits in the size and composition of the brain (Dobbing and Widdowson, 1965), resulting in trauma predisposing to dementia in later life (Roth, 1972). Further evidence has been submitted which implicates a lack of niacin with the irreversible neuronal cell changes seen in senile dementia (Overholser and Fong, 1954:269). Also suggested as a probable precipitating cause of senile deterioration, is folic acid deficiency (Shulman, 1967). In addition to deficiencies in niacin and folic acid, a decline in cerebral oxygen uptake is noted in senile dementia patients (Lassen et al. 1960; Walsh, 1969). Whether low oxygen values are a cause or an effect, was not reported in the literature. Correlation and not causation was established.

**Autoimmunity.** Test results have been consistent with an hypothesis that chronic brain syndrome may be associated with an autoimmune mechanism. Specifically, anti-CNS ab, a circulating antibody, is found in high titers in sera of patients with senile dementia (Tkach & Hokama, 1970).
Host. The host of senile dementia is characterized by his psychological, physical, and situational status. The description of the host, by its very nature, includes factors related to the aged population; for, indeed, the host does experience aging as a process, as do all normal members of the population.

**Psychological factors.** Decreased alertness, narrowing of the span of interest, an insidious loss of memory in the field of spontaneous recall, a decline in fluid mental capacity, and benign forgetfulness, are basic psychological deteriorations recognized in all aged subjects (Overholser & Fong, 1954; Britton & Savage, 1965; Cattell, 1943; Kral, 1972). Emotional affectations include irritability, stubbornness, pettiness, a diminution of spontaneity, and extreme cautiousness (Isaacs, 1965:152). Intellectual changes are seen as a decline in visuo-spatial analysis, and slowed sensory motor response. This latter deterioration produces a lag in decision making (Isaacs, 1965:154). In addition, a general cognitive decline is associated with aging (Owens, 1966). Generally speaking, those afflicted with senile dementia have had previous abnormal personalities and have responded to earlier stresses in life with minor and major psychiatric symptoms (Post, 1965; Kral, 1970; Kral, 1973).

**Physical factors.** The physical status of the aged is influenced by a greater propensity for chronic diseases (Butler & Lewis, 1973:11), and mental illness, especially depression (Farber, 1970). Specifically, arteriosclerosis and senile cardiovascular amyloidosis become major problems to contend with (Rubenstone et al., 1971).
Moreover, difficulties in locomotion contribute to accidental fracture of the thigh bone, a frequent cause of senile deterioration (Villa & Ciompi, 1968).


A morbid risk for senile dementia is seen in siblings, parents, and children of patients with senile dementia (Larsson et al., 1963; Larsson, 1968). Such findings suggest a genetic basis for the disease, making hereditary endowment an important host factor.

Epidemiologic factors. Age, sex, race, marital status, socioeconomic status, occupation, and education, are epidemiologic variables describing the host of the disease process.

(1) Age. The characteristic age of onset of senile dementia is between 60 and 90 years of age, 75 years of age being the average (Butler & Lewis, 1973:76). Risk greatly increases with advancing age, as do incidence and mortality (Larsson et al, 1963; Larsson, 1968; Akesson, 1969).

(2) Sex. Morbidity and mortality findings have consistently shown a preponderance of females in morbidity as opposed to a greater mortality rate for males (Isaacs, 1965; Brand & Gorwitz, 1971; Aldrich & Mendkoff, 1963; Kral, 1972; Roth, 1955; Mayer-Gross, Slater & Martin, 1969; Ciompi, 1968).
(3) **Race.** Observations have elicited a higher mortality rate for the white population than for the non-white population in the United States (Brand & Gorwitz, 1971). Gruenberg's (1954) data indicated that negro race is a variable predisposing an individual to hospitalization for psychiatric illness of the senium. Whether or not this data is related to senile dementia, in particular, was not established in Gruenberg's report.

(4) **Marital status.** Daniel (1972) reported a much higher proportion of unmarried patients with senile dementia, as compared with census figures of the total population studied. Specifically, the "single" group showed the greatest incidence of disease. Larsson et al. (1963) and Larsson (1968) concurred with the increase of senile dementia in single individuals. Married persons have the lowest incidence of the disease when compared with any other category of marital status (Daniel, 1972). Chronologically, highest to lowest incidence of disease appears in the following categories: single, widowed, separated, divorced, and married.

(5) **Socio-economic status.** Senile dementia patients in the hospital show a greater propensity than their normal peers to belong to lower socio-economic groups (Post, 1965:76). Low income, a low level of education, and a lower occupational background, as well as multiple dwelling urban residence, are indicative of the socio-economic status of those vulnerable to the disease (Gruenberg, 1954). Aged individuals in general, the susceptible host for the disease, live at a low level of income. In fact, in 1970, 25% of older persons lived below the yearly income established as the Index of Poverty (Butler & Lewis, 1973:10).
Environment. Geographic distribution, and home and family life, are the variables associated with the environment of the susceptible host.

Geographic distribution and residence. The elderly host tends to live most often in the central parts of cities and in rural areas. Specific areas in the United States, such as northern New England and the Midwest, have a high concentration of older people. Florida state has the highest proportion of elderly population of all states in the union (Butler & Lewis, 1973:8).

Home and family life. A major influence on the status of the elderly in the family has been the disintegration of an extended family structure in the United States (Aring, 1972). In such a structure, the elderly were afforded emotional, and financial security, as well as elevated social status. Insecurity and reduction in status are detrimental to the mental health of the aged person, predisposing him to a symptomology characteristic of pathological cerebral changes due to aging or senile dementia.

Pathogenesis

Senile dementia is a "terminal generalized disorganization of the personality in all its aspects" (Mayer-Gross, Slater & Martin, 1969:609). The course of the disease is from four to six years (Isaacs, 1965:108). The disease begins insidiously with a loss of memory and concentration, errors in judgment, impaired capacity for abstract thought, loss of mental flexibility and adaptation (Isaacs, 1965:109). This gradual onset is accompanied with pathological changes of increasing magnitude with age (Tomlinson & Kitchener, 1972;
Corse11is, 1962). Senile plaques, neurofibrillary change, and granu-
lovacuolar degeneration are present (Mayer-Gross, Slater, & Martin,
1969:605). Impairment of sphincter control occurs early in the course
of the disease, as do deviant forms of sexual behavior (Mayer-Gross,
Slater, & Martin, 1969:608). Disturbed sleep patterns also occur
frequently.

A steady, progressive, and irreversible decline of all per-
sonality functions is characteristic of the progress of the disease.
Specifically, these functions are manifested in a lack of interest and
apathy, carelessness in dress and personal habits, and a disorientation
in place, time, and person. Emotional reactions (such as depression,
Anxiety, and irritability) are associated manifestations (Butler &
Lewis, 1973:76; Curran et al., 1972:122). Two to three years after
onset, the affected individual appears blunted, apathetic, physically
feeble and shrunked. Sudden changes in situation, for example, infec-
tion, fracture, or personal loss, cause proliferation of mental symp-

Late in the course of the disease signs of organic dysfunction
become evident. These signs consist of: (Butler & Lewis, 1973:16)

(1) Auditory and visual hallucinations, especially at night,
(2) Poor orientation for time, place, and person,
(3) Confused comprehension,
(4) Rambling and incoherent speech,
(5) Sleeplessness, restlessness, and wandering from the home,
(6) Paranoid tendencies which may lead to anger and violent
attacks on family members (Ewalt & Farnsworth, 1963:182), and
(7) Manic and hypomanic states.
### Prepathogenesis Period

<table>
<thead>
<tr>
<th>Agent</th>
<th>Period of Pathogenesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aging process</td>
<td>Early Manifestations</td>
</tr>
<tr>
<td>Senile plaques; neurofibrillary changes</td>
<td>Insidious loss of memory; errors in judgment</td>
</tr>
<tr>
<td>Autosomal gene (monohybrid dominant)</td>
<td>Impaired capacity for abstract thought</td>
</tr>
<tr>
<td>Chromosome lagging; Hp' gene</td>
<td>Loss of mental flexibility and adaptation</td>
</tr>
<tr>
<td>Cerebral trauma or injury</td>
<td>Pathological changes: senile plaques, neurofibrillary change and granulovacuolar degeneration</td>
</tr>
<tr>
<td>Social isolation; disengagement</td>
<td>Impairment of sphincter control; deviant sexual behavior</td>
</tr>
<tr>
<td>Niacin deficiency; folic acid deficiency</td>
<td></td>
</tr>
<tr>
<td>Low cerebral oxygen uptake</td>
<td></td>
</tr>
<tr>
<td>Autoimmunity; anti CNS ab</td>
<td></td>
</tr>
</tbody>
</table>

| Host                                         |                         |
| Age: 60 to 90 years; average age is 75       |                         |
| Sex: Preponderance of females in morbidity   |                         |
| Preponderance of males in mortality          |                         |
| Race: Higher mortality rate for white popu-  |                         |
| lation, compared with non-whites             |                         |
| Marital status: Unmarried--single or widowed |                         |
| SES: Lower class, low income, low level of  |                         |
| education, poverty                          |                         |
| Parents, siblings, or children--high risk   |                         |
| Physical, mental, and emotional deterioration of the aging process; Chronic disease |                         |

| Environment                                  |                         |
| Central parts of cities; in rural areas      |                         |
| N. New England, Midwest, and Florida state   |                         |
| Disintegration of extended family structure  |                         |

---

Figure 7. The Natural History of Senile Dementia.
This final stage of the disorder is characterized by total helplessness, sphincter incontinence, and the preservation of vegetative functions only (Larsson et al., 1963). Death usually occurs after an intercurrent infection, an injury or fall, or from a process of "vegetative extinction," (i.e., a syndrome of falling weight, declining activity, and lowering of temperature and blood pressure) (Mayer-Gross, Slater, & Martin, 1969:609). Twenty-seven percent of senile dementia patients die from respiratory disease, however, cardiovascular disease ultimately claims the life of almost all senile dementia patients (Daniel, 1972).

LEVELS OF PREVENTION MODEL

Data from the literature were systematically incorporated into a prevention model for senile dementia. A prevention model designed by Leavell and Clark (see Figure 8) was used as a guideline for the construction of the specific model utilized in this paper. Any deficiency of information pertaining to undefined variables within the model was noted and compensated for. Hence, by means of logical deduction, needs and conditions not appearing explicitly in the available literature were substituted into the model. Thus, compensation in the form of substitution resulted in a completed levels of prevention model for senile dementia.
Figure 8

Levels of Application of Preventive Measures
In the Natural History of Disease

Source: Leavell and Clark (1965)
Schema for the Prevention Model

I. Primary Prevention
   A. Health Promotion
      1. Nutrition
      2. Health Education
      3. Personality Development
      4. Genetics
      5. Housing, Recreation, Overall Level of Living and Working Conditions
      6. Periodic Selective Examination
   B. Specific Protection
      1. Use of Specific Nutrients
      2. Crisis Intervention
      3. Protection from Accidents
      4. Attention to Personal Hygiene

II. Secondary Prevention
   A. Early Diagnosis and Prompt Treatment
      1. Individual and Mass Case-finding Measures
      2. Screening Surveys
      3. Selective Examinations
      4. Treatment
   B. Disability Limitation
      1. Limiting Disability

III. Tertiary Prevention
   A. Rehabilitation
      1. Rehabilitation and Upgrading the Quality of Life Until Death Occurs
### Activity Area*

<table>
<thead>
<tr>
<th>Activity Area*</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiological variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological variables</td>
<td></td>
<td>Needs</td>
</tr>
<tr>
<td>Situational variables</td>
<td>Conditions</td>
<td></td>
</tr>
</tbody>
</table>

*Indicated in the model Schema by arabic numerals

**Figure 9**

Schematic Breakdown of Activity Areas
Used in the Prevention Model
# A PREVENTION MODEL FOR SENILE DEMENTIA

## Primary Prevention
*(Health Promotion)*

<table>
<thead>
<tr>
<th>Nutrition</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physiological variables</strong></td>
<td>Concentration of total proteins, lipids, nitrogen, and phosphorus are low in the aging body (Mayer-Gross et al., 1969)</td>
<td>Knowledge of which foods contain proteins, lipids, nitrogen, and phosphorus*</td>
</tr>
<tr>
<td></td>
<td>Low income groups in cities have inadequate intake of proteins, minerals, and vitamins (Shock, 1957)</td>
<td>Adequate income to buy high protein foods; eliminate prejudices against certain foods; proper dentition (Shock, 1957)</td>
</tr>
<tr>
<td></td>
<td>Undernutrition in early life leads to trauma in brain growth, and deficits in size and composition of the brain (Dobbing &amp; Widdowson, 1965)</td>
<td>Administering vitamin, mineral, and protein supplements: Vitamin E and A (Prehoda, 1968); Vitamin C (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td></td>
<td>Vanadium, trace element, may inhibit formation of cholesterol and arteriosclerosis (Prehoda, 1968)</td>
<td>Study of this element in aged population to see if it is inadequately produced internally or not supplied as intake*</td>
</tr>
<tr>
<td></td>
<td>Deficiency in niacin (Overholser &amp; Fong, 1954)</td>
<td>Adequate intake in diet or as a supplement*</td>
</tr>
<tr>
<td></td>
<td>Folic acid deficiency (low serum folate) (Shulman, 1967)</td>
<td>Provide adequate intake or supplement of folic acid*</td>
</tr>
<tr>
<td></td>
<td>Concentration of metallic elements in aged population, undetermined*</td>
<td>Magnesium, zinc, copper, potassium, should be kept at normal values in the body (Villa &amp; Ciompi, 1968)</td>
</tr>
</tbody>
</table>

*Not explicitly stated in the available literature within the context used here.*
<table>
<thead>
<tr>
<th>Psychological variables</th>
<th>Situational variables</th>
<th>Health Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of memory, narrowed span of interest, slowed responses, decreased alertness (Overholser &amp; Fong, 1954)</td>
<td>Aged are cautious, prefer the familiar, are reluctant to try new things, and resist change (Isaacs, 1965)</td>
<td>To have acquired good nutritional habits before reaching aged years; to educate in principles of good nutrition (Group for the Advancement of Psychiatry, 1971)</td>
</tr>
<tr>
<td>Aged are cautious, prefer the familiar, are reluctant to try new things, and resist change (Isaacs, 1965)</td>
<td>Aged are subject to disengagement, retirement, and social isolation (Crawford, 1971; Larsson et al., 1963)</td>
<td>Trusting and familiar person to prepare and serve food, as well as to attract interest to food*</td>
</tr>
<tr>
<td>Reaction time increases with age, creates lag in decision-making, decline in visuo-spatial analysis, and difficulty in locomotion (Isaacs, 1965)</td>
<td>Decline in sensory function, sight and hearing (Milne &amp; Milne, 1968)</td>
<td>Programs, clubs, and organizations to involve aged in social relationships to stimulate appetite and interest in food*</td>
</tr>
<tr>
<td>Elderly experience an insidious loss of memory (Overholser &amp; Fong, 1954)</td>
<td>Creating educational programs geared to a population with poor recall of recent events*</td>
<td>Education on how to arrange the home environment to compensate for locomotion difficulties, and decline in visuo-spatial analysis*</td>
</tr>
<tr>
<td>Aged are cautious, prefer the familiar, and are resistant to change (Isaacs, 1965)</td>
<td>Self-rejection and cultural exclusion of the elderly (Rudd, 1959)</td>
<td>Methods of health education that can reach a population with these deficits*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Employing a &quot;familiar&quot; context in health educational programs for older persons*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reassessing &quot;old age,&quot; and establishing respect for the elderly (Rudd, 1959)</td>
</tr>
<tr>
<td>Situational variables</td>
<td>Conditions</td>
<td>Needs</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------</td>
<td>-------</td>
</tr>
<tr>
<td>Aged are subject to retirement, disengagement, and isolation (Crawford, 1971; Larsson et al., 1963)</td>
<td>Establishing health education programs that will reach retired, isolated individuals, or that will reach those closest to such persons*</td>
<td></td>
</tr>
<tr>
<td>Only 6% of aged population hold college degrees; 1/7 are functionally illiterate (Butler &amp; Lewis, 1973)</td>
<td>Literature and programs should be at an &quot;educational level&quot; common to most members of the aged population*</td>
<td></td>
</tr>
<tr>
<td>Social and family problems prompt hospital admissions (Haider, 1967)</td>
<td>Methods to improve family relations, and Family Life Education (Leavell &amp; Clark, 1965; Downing &amp; Goldfarb, 1967)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personality Development</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiological variables</td>
<td>Adjusting to an aging body with decline in sight and hearing (Milne &amp; Milne, 1968)</td>
<td>Provide &quot;adjustment mechanisms,&quot; for example, corrective lenses, or hearing aids*</td>
</tr>
<tr>
<td></td>
<td>Slowed motor responses with age (Isaacs, 1965)</td>
<td>Supplement diet with selected vitamins, minerals, etc., whenever needed in order to assure maximum motor responses*</td>
</tr>
<tr>
<td></td>
<td>Presence or absence of disease or infirmity*</td>
<td>Recognize and treat disorders if they exist*</td>
</tr>
<tr>
<td>Psychological variables</td>
<td>Decreased alertness, slowed responses, narrowed span of interest, loss of memory and &quot;benign forgetfulness&quot; (Overholser &amp; Fong, 1954; Kral, 1972)</td>
<td>Provide a psychologically stimulating environment*</td>
</tr>
<tr>
<td></td>
<td>Diminution of spontaneity, resistance to change (Isaacs, 1965)</td>
<td>Create a dynamic environment with inducement toward spontaneous activities*</td>
</tr>
<tr>
<td>Psychological variables (cont.)</td>
<td>Conditions</td>
<td>Needs</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------------</td>
<td>-------</td>
</tr>
<tr>
<td>Presence of personality weakness or character disorders (Post, 1965; Kral, 1970; 1973)</td>
<td>Response to early stress in life was met with major and minor psychiatric symptoms (Post, 1965; Kral, 1970; 1973)</td>
<td>Personal counseling during periods of need (Leavell &amp; Clark, 1965)</td>
</tr>
<tr>
<td>Situational variables</td>
<td>Single marital status; &quot;People who fail to get married have frequently been shown as unduly prone to all kinds of psychiatric disturbances&quot; (Post, 1965: 76)</td>
<td>Establish a profile of this type of aged personality*</td>
</tr>
<tr>
<td>Female sex; greater percentage of women remain single than do men (Butler &amp; Lewis, 1973)</td>
<td>Low status afforded the elderly in the family due to demise of extended family structure (Aring, 1972)</td>
<td>Courses of community education which teach single persons how to cope with a marriage-oriented society*</td>
</tr>
<tr>
<td>Family income, education, and socio-economic status (Haberman, 1970)</td>
<td>Retirement, disengagement, and isolation (Crawford, 1971; Larsson et al., 1963)</td>
<td>Personal development courses to enhance the life-style of single adult women*</td>
</tr>
<tr>
<td>Negative cultural orientation towards aging (Brehm, 1968)</td>
<td></td>
<td>Family Life Education which points out the value of elderly members to the family unit*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Develop an avocation which involves work requiring a high level of personal effort (Sukov, 1971)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Developing a philosophy of aging which points out the positive aspects of aging*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recognize the stresses common to a given socio-economic status, income level, and institute methods of coping with these stresses*</td>
</tr>
<tr>
<td>Genetics</td>
<td>Conditions</td>
<td>Needs</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| **Physiological variables** | Molecular cross-linkage and somatic mutation in aging cells (Prehoda, 1968; Curtis, 1966)  
Presence of monohybrid autosomal dominant gene (Larsson et al., 1963) and multifactorial genes predisposing to senile dementia (Kallman & Sander, 1948) | Continued research studies in cellular aging, particularly cross-linkage and somatic mutation* |
| **Psychological variables** | Hereditary predisposition to certain mental disorders such as depression, or emotional disorders like the neuroses* | Further genetic research to include: molecular genetic studies, and chromosome analysis of patients with senile dementia, as well as their siblings, and children; further epidemiologic studies of genealogy* |
| **Situational variables** | Siblings, parents, and children in high risk group (Larsson, 1968)  
Marriage between two carriers of multifactorial genes*  
Home environment predisposes to maladjusted personality, which interacts with genetic complement to produce disease symptoms* | Ability to cope with stress throughout life and to solve problems within the context of using each crisis as a learning experience* |
|  |  | Recognize the presence of senile dementia in a family and identify risk factors in other members of the family* |
|  |  | Genetic counseling; once knowledge has reached the point at which such can exist with this disease* |
|  |  | Home life which stimulates the development of healthy personalities* |
## Housing, Recreation, and Overall Living and Working Conditions

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physiological variables</strong></td>
<td></td>
</tr>
<tr>
<td>Aged are subject to ill health and chronic disease moreso than younger adults (Butler &amp; Lewis, 1973)</td>
<td>Good level of health so as to be able to function in the type of occupation desired*</td>
</tr>
<tr>
<td>Inadequate housing and income (Butler &amp; Lewis, 1973)</td>
<td>Adequate housing and income for aged and lower socio-economic groups (Ewalt &amp; Farnsworth, 1963)</td>
</tr>
<tr>
<td><strong>Psychological variables</strong></td>
<td></td>
</tr>
<tr>
<td>Isolation resulting from mandatory retirement at age 65 (Crawford, 1971)</td>
<td>Organizations established to facilitate social interaction among the aged, e.g., National Council of Senior Citizens, and the American Association of Retired Persons (Butler &amp; Lewis, 1973)</td>
</tr>
<tr>
<td>Age discrimination in employment (Butler &amp; Lewis, 1973)</td>
<td>Eliminating age discrimination in hiring*</td>
</tr>
<tr>
<td><strong>Situational variables</strong></td>
<td></td>
</tr>
<tr>
<td>95% of aged live in the community with a spouse, family, or friends (Butler &amp; Lewis, 1973)</td>
<td>Improved family relations (Leavell &amp; Clark, 1965)</td>
</tr>
<tr>
<td>Multiple dwelling urban residence is common among the elderly (Gruenberg, 1954)</td>
<td>Recreation which alleviates the stress of living in a crowded, &quot;close,&quot; environment*</td>
</tr>
<tr>
<td>30% aged in the United States live in substandard housing (Butler &amp; Lewis, 1973)</td>
<td>Urban renewal programs in buildings with high population of aged persons*</td>
</tr>
<tr>
<td>More than 25% of aged lived below the Index of Poverty in 1970 (Butler &amp; Lewis, 1973)</td>
<td>Public assistance to the poor (Group for the Advancement of Psychiatry, 1971)</td>
</tr>
<tr>
<td>Situational variables (cont.)</td>
<td>Conditions</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Deteriorated old people in the community usually belong to lower socio-economic groups (Post, 1965)</td>
<td></td>
</tr>
<tr>
<td>Social security ceilings on earnings (Butler &amp; Lewis, 1973)</td>
<td></td>
</tr>
<tr>
<td>Age discrimination in employment (Butler &amp; Lewis, 1973)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Periodic Selective Examinations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiological variables</td>
<td>Aged are afflicted with chronic health problems to a much greater extent than the general population (Butler &amp; Lewis, 1973)</td>
</tr>
<tr>
<td></td>
<td>High incidence of heart disease, arteriosclerosis, and hypertension in aged (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td>Psychological variables</td>
<td>Symptoms of depression and mental illness increase with advancing age (Farber, 1970)</td>
</tr>
<tr>
<td></td>
<td>Screening for depression and other early signs of mental illness*</td>
</tr>
<tr>
<td>Situational</td>
<td>Obstacles to receiving medical care (Group for the Advancement of Psychiatry, 1971)</td>
</tr>
<tr>
<td></td>
<td>More than 25% of the aged lived below the Index of Poverty in 1970 (Butler &amp; Lewis, 1973)</td>
</tr>
<tr>
<td></td>
<td>Therapy to maintain overall level of health; to include vitamin, steroid, hormone, tonic, and stimulant medications (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td></td>
<td>Screening tests for heart disease, arteriosclerosis, and hypertension*</td>
</tr>
<tr>
<td></td>
<td>Creation of an &quot;advocate&quot; for the aged (Group for the Advancement of Psychiatry, 1971)</td>
</tr>
<tr>
<td></td>
<td>Out-reach programs for elderly, e.g., National Welfare Rights Organization, Medicare Alert, and FIND (Butler &amp; Lewis, 1973)</td>
</tr>
</tbody>
</table>
### Use of Specific Nutrients

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lipofussins produced experimentally in nerve cells of rats by vitamin E deficiency and hypoxia (Sulkin &amp; Sremanij, 1960)</td>
<td>Administering vitamin E and A supplements combined to achieve positive effects in aged (Prehoda, 1968)</td>
</tr>
<tr>
<td>Lack of niacin causes irreversible changes in cell structure (Overholser &amp; Fong, 1954)</td>
<td>Administering niacin supplements whenever necessary*</td>
</tr>
<tr>
<td>Vanadium inhibits formation of cholesterol, may prevent arteriosclerosis (Prehoda, 1968)</td>
<td>Administer vanadium supplements whenever necessary and appropriate*</td>
</tr>
<tr>
<td>Inadequate intake of protein, minerals, and vitamins (Shock, 1957)</td>
<td>Administer protein, mineral, and vitamin supplements to aged persons with inadequate intake*</td>
</tr>
<tr>
<td>Aged are cautious, reluctant to try new things and resist change (Isaacs, 1965)</td>
<td>Overcome idiosyncratic characteristics so as to ensure aged person will take prescribed supplements*</td>
</tr>
<tr>
<td>Loss of memory and concentration, and errors in judgment (Isaacs, 1965)</td>
<td>Devise arrangement of medications such that it would be more difficult to forget to take prescribed medicines*</td>
</tr>
<tr>
<td>More than 25% of aged lived below Index of Poverty in 1970 (Butler &amp; Lewis, 1973)</td>
<td>Assure aged financial ability to purchase required supplements and/or proper foods which contain the appropriate nutrients*</td>
</tr>
</tbody>
</table>
### Conditions

<table>
<thead>
<tr>
<th>Situational variables (cont.)</th>
<th>Most aged persons live in the community with spouse, family, or friends (Butler &amp; Lewis, 1973)</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crisis Intervention</td>
<td>Make family, spouse, or friend knowledgeable of the required nutrients for the aged member of the household*</td>
<td></td>
</tr>
</tbody>
</table>

### Physiological variables

- Aged have a higher rate of chronic disease than any other age group (Butler & Lewis, 1973)
- Acute infection could proliferate mental symptoms of aged (Mayer-Gross et al., 1969)
- Loss of balance and lack of coordination occur with age (Peck, 1970)
- Negative attitudes toward "aging" and the "aged" (Rudd, 1959)
- Division of interest and lack of sympathy between young and aged (Rudd, 1959)
- Disengagement, tendency to withdraw from the center of life (Isaacs, 1954; Crawford, 1971)
- Stress from crucial transition points in life, e.g., personal loss (Rapoport, 1963; Mayer-Gross et al., 1969)

### Needs

- Treat the chronic disease in order to prevent its leading to depression and anxiety*
- Treat acute illness to avoid debilitation and chronicity*
- Counsel and educate on the ability to compensate for certain motor reductions*
- Suggest advisory centers for the aged (Rudd, 1959)
- Interpret needs of the aged to the young and vice versa (Rudd, 1959)
- Develop group involvement and social interaction; and to supply the means to achieve such activities in aged population*
- Promoting positive mental health in persons during vulnerable periods of life, e.g., Family Life Education courses (Downing & Goldfarb, 1967)
<table>
<thead>
<tr>
<th>Psychological variables (cont.)</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological and emotional reactions caused by mental deficits in the aged (Butler &amp; Lewis, 1973)</td>
<td></td>
<td>Providing indirect consultative services to individuals of special local concern, e.g., welfare clients and socially disadvantaged (Downing &amp; Goldfarb, 1967)</td>
</tr>
<tr>
<td>Reactions called release phenomena, i.e., latent personality traits and tendencies which occur as a result of brain deterioration (Butler &amp; Lewis, 1973)</td>
<td></td>
<td>Anticipatory counseling and crisis intervention (Leavell &amp; Clark, 1965)</td>
</tr>
<tr>
<td>Situational variables</td>
<td>Reduction in status of the aged member in the family due to a decline in extended family structure (Aring, 1972)</td>
<td>Improved family relations and family life education (Leavell &amp; Clark, 1965)</td>
</tr>
<tr>
<td>Family income, education, socio-economic status (Haberman, 1970)</td>
<td></td>
<td>Public assistance to the poor elderly (Group for the Advancement of Psychiatry, 1971)</td>
</tr>
<tr>
<td>Retirement, disengagement, and isolation (Crawford, 1971; Larsson et al., 1963)</td>
<td></td>
<td>Planning for post-retirement careers and hobbies (Ewalt &amp; Farnsworth, 1963)</td>
</tr>
<tr>
<td>Protection from Accidents</td>
<td>Physiological variables</td>
<td>Needs</td>
</tr>
<tr>
<td>Time between stimulus and response increases with increasing age (Isaacs, 1965)</td>
<td>Assuring best possible motor response by adequate intake of niacin and other vitamins and minerals*</td>
<td></td>
</tr>
<tr>
<td>Loss of balance and lack of coordination occur with age (Peck, 1970)</td>
<td>Assuring adequate blood and oxygen supply to the brain by administering drug therapy when needed*</td>
<td></td>
</tr>
<tr>
<td>Trauma to the brain is associated with plaque formation and neurofibrillary change (Corsellis &amp; Brierly, 1959; Roth, 1972)</td>
<td>Preventing trauma to the brain by preventing cerebrovascular accidents, cerebral hemorrhages, and by treating arteriosclerosis*</td>
<td></td>
</tr>
</tbody>
</table>
Physiological variables (cont.)

Accidental fracture causes proliferation of mental symptoms in aged (Mayer-Gross et al., 1969); fracture of thigh bone is frequently a cause of senile deterioration (Villa & Ciompi, 1968)

Psychological variables

Lack of interest and apathy; carelessness of dress and personal habit (Butler & Lewis, 1973)

Disorientation in time, place, and person (Curran et al., 1972)

Emotional reactions such as depression, anxiety, and irritability (Curran et al., 1972)

Loss of memory and concentration; errors in judgment (Isaacs, 1965)

Situational variables

Multiple dwelling urban housing (Gruenberg, 1954)

Aged live at home with spouse, family, or friends (Butler & Lewis, 1973)

Conditions

Needs

Preventing fractures by making sure bone tissue is healthy and strong through adequate vitamin and mineral intake*

Motivation to pay attention to personal appearance; develop interest in home environment through active participation in its maintenance*

Communication by members of family with the aged member to increase awareness of surroundings*

All members of immediate household should try to generate an enthusiasm toward life and practice patience toward the aged member*

Frequent communication so that persons living in the household or visiting, can predict which psychological disorders would predispose to accidents in the specific environment*

Upgrade the standard of housing available to the elderly, and reduce over-crowded conditions*

Educate family members on safety in the home*
<table>
<thead>
<tr>
<th>Situational Variables (cont.)</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retired, isolated, and disengaged (Crawford, 1971; Larsson et al., 1963)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazards in the home environment*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Attention to Personal Hygiene

<table>
<thead>
<tr>
<th>Physiological Variables</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic disease and infirmity (Butler &amp; Lewis, 1973)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carelessness of dress and personal habit (Butler &amp; Lewis, 1973)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Psychological Variables</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of interest and apathy (Butler &amp; Lewis, 1973)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of memory and errors in judgment (Isaacs, 1965)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disorientation in time, place, and person (Curran et al., 1972)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Situational Variables</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retired, isolated, and disengaged (Larsson et al., 1963; Crawford, 1971)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Promote out-going activities, organizations, and associations*  
Family and friends should be alert to hazards in the aged person's environment*  
Treat disease and limit disability*  
Attention to weight, and vitamin, protein, and mineral intake to insure healthy skin and hair*  
Stimulate interest and divert apathy by social interaction*  
Reminders from friends and family members about neglect in personal habits, e.g., shaving, washing hair*  
Encourage strong family ties and social affiliations which would motivate good personal hygiene*  
Membership in social organizations to provide peer group pressure*
<table>
<thead>
<tr>
<th>Situational variables (cont.)</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decline in status in family due to demise of extended family structure (Aring, 1972)</td>
<td></td>
<td>Family ties to assure attention and status to the elderly*</td>
</tr>
<tr>
<td>Live at home with spouse, family, and friends (Butler &amp; Lewis, 1973)</td>
<td></td>
<td>Educate family members in motivating aged to take care of themselves*</td>
</tr>
</tbody>
</table>

**Secondary Prevention**
*(Early Diagnosis and Prompt Treatment)*

**Individual and Mass Case-finding Measures**

<table>
<thead>
<tr>
<th>Physiological variables</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical signs and symptoms present or absent*</td>
<td></td>
<td>Case identification and referral (Leavell &amp; 1965)</td>
</tr>
<tr>
<td>Infection or fracture causes proliferation of mental symptoms (Mayer-Gross et al., 1969)</td>
<td></td>
<td>Educate the family practitioner in early signs and symptoms*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Psychological variables</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early stages may be revealed through deviant forms of sexual behavior, e.g., exhibitionism (Mayer-Gross et al., 1969)</td>
<td></td>
<td>Education of professionals in the community to the signs and symptoms of early senile dementia, e.g., law enforcement officers, social workers, ministers*</td>
</tr>
<tr>
<td>Psychological, emotional, and intellectual signs and symptoms present or absent*</td>
<td></td>
<td>Case identification, referral, and family education programs for identification of problems (Leavell &amp; Clark, 1965)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Situational variables</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged live in community with spouse, family, or friends (Butler &amp; Lewis, 1973)</td>
<td></td>
<td>Family education programs to enable family members to cope with a dementia patient in the home*</td>
</tr>
<tr>
<td>Conditions</td>
<td>Needs</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Situational variables (cont.)</td>
<td>Family education programs to enable members to identify disease symptoms*</td>
<td></td>
</tr>
<tr>
<td>Family and friends constitute the second greatest source of extramural referral for psychogeriatric hospital admission (U.S. Dept of HEW, 1973c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screening Surveys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiological variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morbidity risk increases with increasing age (Larsson et al., 1963; Larsson, 1968)</td>
<td>Screening surveys at an early age, i.e., before onset*</td>
<td></td>
</tr>
<tr>
<td>Prevalence and incidence increase with age (Akesson, 1969)</td>
<td>Analyze prevalence and incidence ratings in a given geographic area and institute screening for areas with greater numbers in the high risk group*</td>
<td></td>
</tr>
<tr>
<td>Morbidity rates show a preponderance for females (Daniel, 1972)</td>
<td>Screening for females during menopause*</td>
<td></td>
</tr>
<tr>
<td>Mortality rates show a preponderance for males (Brand &amp; Gorwitz, 1971)</td>
<td>Screening of males before retirement*</td>
<td></td>
</tr>
<tr>
<td>Symptoms appear between ages 60-90; age 75 years on the average (Butler &amp; Lewis, 1973)</td>
<td>Screening before age 60 for both sexes*</td>
<td></td>
</tr>
<tr>
<td>Presence of rheumatic mitral stenosis precipitates senile deterioration in 3 to 5% of cases (Bruetsch &amp; Williams, 1959)</td>
<td>Special screening and referral*</td>
<td></td>
</tr>
<tr>
<td>Arteriosclerosis, hypertension, and history of cerebrovascular accident (Villa &amp; Ciompi, 1968)</td>
<td>Screening and referral for individuals having such disorders*</td>
<td></td>
</tr>
<tr>
<td>Psychological variables</td>
<td>Situational variables</td>
<td>Needs</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td><strong>Parents, siblings, and children of senile dementia patients are more apt to be affected by the disease than the general population (Akesson, 1969)</strong></td>
<td><strong>Campaigns to encourage participation in screening surveys</strong>*</td>
</tr>
<tr>
<td>Retired, isolated, and disengaged (Crawford, 1971; Larsson et al., 1963)</td>
<td><strong>Those afflicted belong most often to lower socio-economic groups (Post, 1965)</strong></td>
<td><strong>Family history should be an important part of any screening program</strong>*</td>
</tr>
<tr>
<td><strong>Situational variables</strong></td>
<td><strong>Susceptible are most often unmarried and of single status (Haberman, 1970; Daniel, 1972)</strong></td>
<td><strong>Screening in lower socio-economic areas should be offered at nominal fee or gratis</strong>*</td>
</tr>
<tr>
<td>Retired, isolated, and disengaged (Crawford, 1971; Larsson et al., 1963)</td>
<td><strong>Isolation from stimulating people and surroundings (Eaton &amp; Peterson, 1969)</strong></td>
<td><strong>Include marital status as a screening variable</strong>*</td>
</tr>
<tr>
<td>Parents, siblings, and children of senile dementia patients are more apt to be affected by the disease than the general population (Akesson, 1969)</td>
<td><strong>Home is the permanent resident of most patients prior to hospitalization (Daniel, 1972)</strong></td>
<td><strong>Screening survey should include some measure of social interaction or social isolation</strong>*</td>
</tr>
<tr>
<td><strong>Selective Examinations</strong></td>
<td><strong>Physiological variables</strong></td>
<td><strong>Gain support of family members in the value of screening for senile dementia</strong>*</td>
</tr>
<tr>
<td><strong>Needs</strong></td>
<td><strong>Clinical findings related to: spinal fluid, electroencephalogram, skull x-rays, and pneumoencephalogram (Barrett, 1972)</strong></td>
<td><strong>Conduct clinical laboratory tests as indicated, whenever a diagnosis of senile dementia is suspected</strong>*</td>
</tr>
</tbody>
</table>

*Denotes recommended action.
<table>
<thead>
<tr>
<th>Psychological variables</th>
<th>Situational variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distinguishing between depression and senile dementia (Rosenthal, 1970)</td>
<td>Single, isolated, lower socio-economic status (Daniel, 1972; Post, 1965; Larsson et al., 1963)</td>
</tr>
<tr>
<td>Intellectual decline; impaired capacity for abstract thought (Isaacs, 1965)</td>
<td>Retired, disengaged (Crawford, 1971)</td>
</tr>
<tr>
<td>Gaps in memory covered up by a facade (Mayer-Gross et al., 1969)</td>
<td></td>
</tr>
<tr>
<td>Auditory or visual hallucinations; poor orientation for time, place, and person; confused comprehension; rambling and incoherent speech (Butler &amp; Lewis, 1973)</td>
<td></td>
</tr>
<tr>
<td>Emotional reactions due to brain deficiencies (Butler &amp; Lewis, 1973)</td>
<td></td>
</tr>
<tr>
<td>Long-standing personality deficiencies (Post, 1965)</td>
<td></td>
</tr>
</tbody>
</table>

**Needs**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>More conclusive clinical testing is needed in this area*</td>
</tr>
<tr>
<td>More research in learning theory and in the relationship of brain deterioration to intellectual decline*</td>
</tr>
<tr>
<td>Family members must assist in the recognition of facades in the elderly members*</td>
</tr>
<tr>
<td>Accurate history-taking, interview with family members, and perhaps a period of hospitalization for observation*</td>
</tr>
<tr>
<td>Emotional reactions must be recognized and judged in relation to environment and previous personality traits*</td>
</tr>
<tr>
<td>Coping mechanisms should be taught to aged persons exhibiting long-standing personality deficiencies*</td>
</tr>
<tr>
<td>Recognize and minimize isolation and discern marital status*</td>
</tr>
<tr>
<td>Identify retired person and recognize signs of disengagement*</td>
</tr>
<tr>
<td>Conditions</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cardiovascular disorders are responsible for more than half of all senile mental disorders (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td>Arteriosclerosis and cerebrovascular accidents are frequent findings in aged patients (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td>Gastro-intestinal disorders impair condition of brain diseased elderly by causing dehydration (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td>Chronic urinary tract infections precipitate confusional states (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td>Cerebral hemorrhage, hemodynamic disorders, and confusional states may be present (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td>Anorexia leads to poor nutrient intake (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td>Cell deterioration and progressive loss of cells with age (Prehoda, 1968)</td>
</tr>
<tr>
<td>Conditions</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Physiological variables (cont.)</strong></td>
</tr>
<tr>
<td>Number of functioning nerve cells decreases with age (Milne &amp; Milne, 1968)</td>
</tr>
<tr>
<td>Folic acid deficiency present in 75% of all geronto-psychiatric admissions (Shulman, 1967)</td>
</tr>
<tr>
<td>Severely demented aged persons have lowest values of cerebral oxygen uptake (Lassen et al., 1960)</td>
</tr>
<tr>
<td>Neurons become damaged through aging process and cerebrovascular accidents (Villa &amp; Ciampi, 1968)</td>
</tr>
<tr>
<td>80% of elderly demented patients receive tranquilizers unnecessarily (Barton &amp; Lindsay, 1966)</td>
</tr>
<tr>
<td><strong>Psychological variables</strong></td>
</tr>
<tr>
<td>Memory deterioration and psychological symptoms appear in aged (Overholser &amp; Fong, 1954; Kral, 1972)</td>
</tr>
<tr>
<td>Psychological variables (cont.)</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>Grief and restitution from loss of loved ones; uselessness felt from bodily dysfunction and disability; and guilt and atonement associated with reconciliations (Butler &amp; Lewis, 1973)</td>
</tr>
<tr>
<td>Behavioral problems in the aged seen as &quot;senile delinquency,&quot; i.e., irritability, stubbornness, and pettiness (Isaacs, 1965)</td>
</tr>
<tr>
<td>One-third of psychogeriatric hospital admissions are due to family problems, and purely social reasons (Haider, 1967)</td>
</tr>
<tr>
<td>Home environment often tense, with fear and anxiety abounding (Isaacs, 1965)</td>
</tr>
<tr>
<td>Situational variables (cont.)</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>Relocating elderly patients results in transfer mortality and exacerbated anxiety, confusion, and depression (Group for the Advancement of Psychiatry, 1971; Lieberman, 1961)</td>
</tr>
<tr>
<td>Most aged live in the community with spouse, family, or friends (Butler &amp; Lewis, 1973)</td>
</tr>
<tr>
<td>Obstacles to access of medical care (Group for the Advancement of Psychiatry, 1971)</td>
</tr>
</tbody>
</table>

therapeutic community, i.e., the organization of a skilled nursing facility into an unambiguous social structure with defined role expectations (Donahue, 1968); creating outpatient clinics, and day and night hospitals (Leavell & Clark, 1965)
### Secondary Prevention
(Disability Limitation)

<table>
<thead>
<tr>
<th>Limiting Disability</th>
<th>Conditions</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiological</td>
<td>After 2 1/2 to 3 years of hospitalization 90% of cases of senile dementia have died (Roth, 1955)</td>
<td>Prevent or delay the consequences that occur from clinically advanced disease (Leavell and Clark, 1965)</td>
</tr>
<tr>
<td>variables</td>
<td>Death usually occurs after an intercurrent infection, respiratory disease, e.g., pneumonia (Birkett, 1972; Daniel, 1972), an injury or fall, or from a process of &quot;vegetative extinction&quot; (Mayer-Gross et al., 1969)</td>
<td>Provide treatment to arrest the disease process and prevent further complications or sequelae (Leavell &amp; Clark, 1965)</td>
</tr>
<tr>
<td>Psychological</td>
<td>Distortions of personality functions associated with severe destruction of the patient's social relationships (Leavell &amp; Clark, 1965)</td>
<td>Creating a therapeutic community (Donahue, 1968), and structuring a medically and socially prosthetic milieu (Butler &amp; Lewis, 1973)</td>
</tr>
<tr>
<td>variables</td>
<td>Three-quarters of all senile dementia patients are discharged from the hospital within 30 days (Wells &amp; Liebowitz, 1972)</td>
<td>Family care and half-way houses (Leavell &amp; Clark, 1965); and preserving ties with the home for the patient who is discharged (Overholser &amp; Fong, 1954)</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>Conditions</td>
<td>Needs</td>
</tr>
<tr>
<td>----------------</td>
<td>------------</td>
<td>-------</td>
</tr>
<tr>
<td>The following are examples of how to minimize the effects of deterioration</td>
<td>Rehabilitation in the senile dementia patient involves a delay of eventual death, and the upgrading of the quality of life until death does occur.</td>
<td>As yet, there is no cure for senile dementia and the eventual outcome is death. Death most frequently occurs by intercurrent infection, injury, or vegetative extinction. To delay death would be to prevent these specific complications.</td>
</tr>
<tr>
<td>Physiological variables</td>
<td>Presence of chronic disease which impairs physiological function and locomotion (Villa &amp; Ciompi, 1968)</td>
<td>Treatment for specific chronic diseases (Villa &amp; Ciompi, 1968)</td>
</tr>
<tr>
<td>Psychological variables</td>
<td>Deterioration of personality, emotional response, and intellectual capacity (Mayer-Gross, et al., 1969)</td>
<td>Occupational therapy activities (Cosin, 1958); reality orientation classes, and remotivation sessions (Spiller, 1974; Folsom, 1968)</td>
</tr>
<tr>
<td>Situational variables</td>
<td>Three-quarters of patients are discharged from hospital within 30 days (Wells &amp; Liebowitz, 1972)</td>
<td>Sociotherapy: ergotherapy, ludotherapy, and kinesitherapy (Villa &amp; Ciompi, 1968); safeguarding the patient's home so that it will be available to him at the time of discharge (Haider, 1967)</td>
</tr>
<tr>
<td>Retirement, isolation, and disengagement (Crawford, 1971; Larsson et al., 1963)</td>
<td>Establishing clubs for former patients (Leavell &amp; Clark, 1965)</td>
<td></td>
</tr>
</tbody>
</table>
SUMMARY

The analysis chapter has included the natural history of senile dementia, and a theoretical prevention model for this disease. Needs and conditions expressed in the literature were substituted into the structure of the model. Furthermore, these needs and conditions were associated with three variables: physiological, psychological, and situational. In addition, three levels of prevention were delineated: primary, secondary, and tertiary. A total of sixteen activity areas, relevant to these levels, were outlined within the context of the theoretical model.

Data obtained from the available literature were substituted into the model. Conditions and needs not appearing explicitly in the literature were added to the model by means of logical deduction and inference.
Chapter 5

DISCUSSION AND RECOMMENDATIONS

The approach of this discussion is oriented toward the principles relevant to program development. In particular, epidemiologic and demographic variables will define the target population for a program of prevention for senile dementia. The next step in this approach involves the expansion and specification of the needs and conditions delineated in the theoretical prevention model presented in the preceding chapter. Primary, secondary, and tertiary activities pertinent to these needs and conditions are reviewed. Finally, the implications for health education based upon epidemiologic and demographic variables, the prevention model, and the review of the literature relevant to prevention are presented.

Specific recommendations and suggestions applicable to all of these areas are included. The concluding section outlines these recommendations succinctly and in broad terms.

EPIDEMIOLOGIC AND DEMOGRAPHIC VARIABLES
DEFINING A TARGET POPULATION

A number of epidemiologic and etiologic variables related to senile dementia were collected during the survey of the literature. These factors were presented in both the literature review and analysis chapters of this paper. Analysis of these variables resulted in a schematic for the natural history of senile dementia.
Although the natural history outline seems complete, expansion of its concepts and variables should prove useful to this discussion, especially since these variables delineate a target population. A target population must be defined before any program of prevention can be implemented. The natural history of a disease provides such definition.

After examining the information provided in the available literature, it was determined that data related to certain demographic variables are lacking. Recognition and discussion of these factors is warranted based on two assumptions: (1) in order to achieve an accurate estimation of a target group, it is necessary to include as many descriptive variables as possible, and (2) the recognition of deficiency is the first step toward elimination of a deficit. The following discussion of selected variables reflects these two assumptions.

Race

Race is an important variable to any disease. Data obtained for this paper includes only statistics for whites and non-whites. A further breakdown of racial composition is desirable from an epidemiologic and etiologic frame of reference. Therefore, it is recommended that research studies retrieve data specific for racial composition of senile dementia cases.

Ethnicity

A demographic description of a population is not complete until ethnic content is determined. Haberman (1970) included ethnicity as a variable in his community survey of psychiatric symptoms. However, ethnic diversity specific to diagnosed senile dementia patients was
not reported in any of the references cited in this paper. A recommendation to observe ethnic differences in senile dementia patients infers that such data be reported formally in geronto-psychiatric literature.

Geographic Distribution

Geographic location is an epidemiologic variable to disease. Either the region in which one lives attributes to the disease process (e.g., influenza, and other communicable disease epidemics), or by chance a high proportion of individuals with a predisposition toward a particular disease, inhabit a given geographic area. In the review of the literature the aged population was delineated geographically (Butler & Lewis, 1973), but there was no specific geographic distribution reported in the literature for the incidence of senile dementia. Furthermore, there was no mention of comparison of incidence and prevalence rates between one country and another.

In order to achieve validity in the statistics defining the total world-wide population susceptible to senile dementia, geographic studies should be conducted. Incidence and prevalence rates for this disease should be compared internationally, especially since variables related to climate, altitude, as well as culture and society, are dependent upon geographic location.

Perhaps a disease is more frequent in economically developed countries as opposed to developing countries. An hypothetical statement such as this, only can be supported through comparison of incidence statistics for a number of countries. However, the difficulty of such an endeavor could be monumental, since even if a level of
comparison were achieved, it would be necessary to judge data in relation to: (1) the definition of senile dementia in each specific country, and (2) the life-span of the inhabitants of each country.

Religion

Since religious affiliation is so intricately related to cultural values, its inclusion as a demographic variable to disease is pertinent. Unfortunately, the literature reviewed in this paper was deficient of data on religious affiliation. This is indeed unfortunate, because preventive medicine activities must take into account the tenets of various religious groups, particularly the Christian Science religion and Jehovah's Witness. Another vital fact is that religious affiliation can be utilized as a resource for the activities planned in a program for prevention.

Religion is also closely associated with ethnicity. As far as senile dementia is concerned, the attitude of the family toward the elderly member may have a bearing on the extent of senile disease in the aged member. As a result, religious affiliation should be included in the data gathered during case histories of patients. Ethnicity and religious affiliation are valuable co-variables in the analysis of the aged population susceptible to senile dementia.

Occupation

A breakdown by occupational history might provide pertinent data relevant to the transition from prepathogenesis to pathogenesis of senile dementia. In fact, it is impossible to establish a correlation between occupational history and the natural history of this disease without this baseline data. Also, the reaction of the aged
individual to retirement, might be influenced by the type of work he was engaged in prior to retirement, and throughout life.

Crawford (1971) analyzed post-retirement disengagement and its relationship to manual and non-manual work. He found that manual workers were more likely to identify retirement with disengagement than non-manual workers ($p < 0.01$). Undoubtedly variables such as socio-economic status, education, and income were implicit in this finding.

If an occupational breakdown were established for senile dementia patients, a relationship between this disease and disengagement may become evident, thus, providing an etiological link between situational variables and the disease process.

**Personal Habit**

Only one reference cited related a personal habit to brain disease in the aged. Specifically, Brock et al. (1972) found no association between cleanliness and mental health levels. Data gathered in the future will have to take into account habits such as smoking, drinking alcoholic beverages, over-eating, and drug abuse. Each of these variables to disease must be weighed statistically for significance in relationship to the development of senile dementia. A few of these practices may be etiologically linked. The only way this can be proved, however, is through observation and analysis over a period of years.

**Life-Styles**

Numerous life-styles can be described. However, there are three specific ways of living which should be investigated as far as
their relationship to senile dementia is concerned. These include:
(1) living as a "liberated" woman, (2) life imprisonment, and
(3) living in a religious community.

Women's liberation. As a social movement for independence, women's liberation influences marital status, educational level, income, and occupation. More women as a result, are choosing to remain single, continuing education beyond the baccalaureate, and entering occupations previously open to men only.

Since women are presently more susceptible to senile dementia (Daniel, 1972), it would be interesting to see if in the future this tendency is aggravated or offset in women who have been liberated in their 20's, 30's, and 40's. Single status would most likely increase the tendency for the disease, whereas, achievement in a masculine occupational level might alleviate this increase. Careful longitudinal studies of liberated women should prove fruitful from both an epidemiological and preventive standpoint.

Life imprisonment. Although only a small percent of the American population is spending adult life in prison, this sub-group of American society offers a standard of comparison to the general populace. Investigation into the life-style of the long term prisoner and its relationship to the development of senile dementia is a worthwhile research effort. As a result of this research, the general pool of knowledge regarding this disease would be expanded.

Religious communities. Religious communities offer yet another life-style which warrants investigation, especially those groups which
foster single status as a way of life. As stated in the review of the literature, single status is an important variable to the development of senile dementia in old age (Daniel, 1972).

It would be interesting to note if the religious way of life offers compensating or alleviating factors which would negate the effect of single status. If so, a theory of relatedness in variables to senile dementia might be expounded (i.e., given temperance in personal habits, and a meaningful occupation, single status as a predisposing factor can be alleviated, all other variables being held constant).

General Conclusion

Such patterns as discussed above, could be extended to include other variables in the general population. Eventually a complete epidemiologic map may be devised which would take into account all of the variables reported in the literature and those discussed in this section.

SPECIFIC RECOMMENDATIONS BASED UPON IDENTIFIED NEEDS

The objectives and goals established during program development are generated from identified needs. In Chapter 4 conditions and needs were presented within the framework of a levels of prevention model. Therefore, the following discussion relevant to needs, goals, and objectives is divided into three major areas: primary, secondary, and tertiary level activities. (For a schematic of these divisions, see page 104.)
The purpose of this area of discussion is to expand upon the general needs outlined in the analysis section, for in most cases these needs were specified in broad terms only. Furthermore, details expressing the activities required to fulfill these needs were not always supplied. Hopefully, the recommendations and suggestions presented in this section will fill part of this deficit.

**Primary Level Activities**

Activities related to health promotion and specific protection against disease constitute two areas of primary prevention. Particular activity levels within these areas which will be discussed in this section are listed below.

**Health Promotion**

Nutrition
Health Education
Personality Development
Genetics
Housing, Recreation, Overall Level of Living and Working Conditions

**Specific Protection**

Crisis Intervention
Protection from Accidents

**Nutrition.** The nutritional needs on a health promotional level can be met in a number of ways. In the section on primary prevention, nutritional activities in the prevention model, specific needs were delineated. The following recommendations augment these needs.
Visiting health educators. In order to meet the basic nutritional information needs of the elderly population, the establishment of a health education team, trained to speak to various aged groups, is recommended. This team might be comprised of a health educator, nutritionist, or dietician.

Included in the program should be the recognition of cultural biases in the choice of foods. Each group should be approached within the orientation of its cultural, ethnic, and racial composition. In addition, every attempt should be made to recruit educators for the team from all ethnic and racial backgrounds. In this manner, both acceptability and credibility will be attributed to the program.

Ideally, the visiting health educator program should be provided for all aged persons in senior citizens groups, adult leisure clubs, and retirement villages. Furthermore, a similar program should be provided for staff members of board and care homes for the aged, convalescent homes, and skilled nursing facilities.

Biochemical research. Studies of specific trace elements and their role in the anabolism or catabolism of various substances in the body is recommended. Specifically, vanadium should be studied, especially its role in the formation of cholesterol.

An investigation into the variables related to folic acid deficiency in the aged also should be conducted. The biochemical properties of this substance should be studied in vivo and in vitro.

Controlled experimentation with vitamin supplements. Pilot studies of vitamin supplements administered during middle age are needed. Specifically, niacin (nicotinic acid), vitamins E, A, and C
should be used in these studies. These substances should be administered alone, and in mutually exclusive combination, for example:

Niacin: alone, nE, nA, nC, nEA, nEC, nAC
Vitamin E: alone, AE, CE, EAC
Vitamin A: alone, AC
Vitamin C: alone

Studies of other vitamins and minerals could be varied in the same schematic as illustrated above. Furthermore, additional studies could be conducted concurrently in vitro in laboratory animals (e.g., monkeys and mice).

Protein deficiency. Longitudinal studies of protein deficiency and supplement are indicated. These controlled studies in the aged might prove valuable as sources of pertinent information regarding the role of protein deficiency in personality disorders and psychosis of aged subjects.

Diet and associated variables. Further analysis of the diet of aged individuals is needed. Particular aspects of diet should be correlated with such variables as sex, race, age, geographic location, occupation, and income, as well as to the development of senile dementia. Shock (1957) reported that low income groups living in cities have an inadequate intake of protein, minerals, and vitamins. The studies recommended here; however, would include additional variables and a more extensive breakdown of specific nutrients (e.g., specific vitamins, proteins, and minerals).
Health education. The challenge of health education for the aged population is to adapt standard educational methods to meet the needs of a population with specific learning difficulties. For example, sources of media must be derived which will be appealing to those persons aged, single, living alone, isolated, and disengaged.

Reaching this population might be achieved by utilizing intermediate personnel, for instance, physicians, nurses, and representatives of senior citizens groups. Public media resources such as television, radio, and the local newspaper also should be included as means of transmitting information. Moreover, the particular approach used should be adjusted to compensate for poor recall, a characteristic of benign forgetfulness in the aged.

Goals of health education. Health education programs need to be established to promote respect for the elderly in the community. In addition, the role of the aged person within today's family needs redefinition. This is partially due to the fact that the structure of the family is in transition (i.e., from extended family structure to nuclear family structure).

Moreover, it would be advantageous to have the aged member of the family and community promulgate his own role identity. This might be accomplished through group encounters among the aged conducted in familiar settings, such as senior citizens' groups, leisure clubs, and church affiliated organizations. Cross-cultural solutions to the problem of the aged member in the family and community might be debated in these sessions. Oriental, European, Judaic, Arabic, South American, and North American traditions also should be included in the content of
discussion. Feelings and attitudes resulting from the demise of extended family structure can be aired. These, and other spontaneously elicited issues, should be discussed as they arise.

Personality development. In order to better stipulate the requirements for activities related to personality development, it is necessary to derive a profile of a "senile dementia-prone personality." This can be accomplished by means of ex post facto studies and longitudinal studies. In this way, the natural history outline can be expanded to include a distinct personality type documented by case studies. The preceding discussion on epidemiologic and demographic variables indicated which variables are important in this profile.

Personal counseling and despair. Personal counseling during periods of stress is a valuable means of guiding the personality to a healthy developmental level. Unresolved crises in the aged can result in isolation, self-absorption, and eventually despair (Erickson, 1956a, 1956b). Bancroft (1973) pointed out that the reminiscing of a despairing individual fulfills a need in him, and also provides insight for whoever is caring for the individual. Moreover, present behavior can be judged in relation to the presence or absence of despair. A positive attitude toward the bitterness and complaining brought on by despair enables those caring for the aged to recognize the strengths the elderly have to draw upon and to counsel appropriately.

Activities designed to enhance personality development. Program activities designed specifically to enhance the personality development of the aged, must include techniques which foster
age-awareness and self-acceptance. The goal of such activities should be to increase self-esteem, and to utilize the concept of age as a self-actualizing instrument, not an instrument of self-absorption and despair.

Since single status is associated with a greater susceptibility to senile dementia (Daniel, 1972), the personality needs of the unmarried should be investigated. Larsson (1968) found a positive correlation between isolation, single status, and senile dementia. One of the contributing factors to isolation could be the role delegated to single persons by society. Indeed this is the premise for a course offered by Everywoman's Village in Van Nuys, California, a non-profit corporation, dedicated to self-understanding and creative expression. The program consists of a series of nine lectures including a rap session for gripes and goals. Topics discussed include:

- Psychological Games Singles Play
- Risks and Rewards of Being Unmarried
- Non-Commercial Amusements and Diversions for Single Adults
- Finding Your Power as a Single Person
- Sex and the Single Adult
- A Psychiatrist Looks at Singles' Loneliness
- Self-Reliance: Key to Our Success as Singles
- Putting It All Together: Accepting the Realities of Single Life (Everywoman's Village, 1974-75)

Open to single men and women age 25-45, this course offers practical guidelines to coping with a marriage-oriented society. As an exploration into a better life-style for single adults, this program offers its members a sense of group identity. This is evident by observing
the sequence of lecture topics and the emphasis of each (i.e., Finding YOUR power as a single person, to Self-Reliance: Key to OUR Success as Singles).

Other programs, lectures, and courses modelled after this one should be instituted throughout the country. If the isolation of single status is minimized by these courses, then hopefully, the predisposition to senile dementia also will be minimized.

Genetics. The needs relative to genetics, discussed in the analysis section of this paper, were rather specific. However, two points should be stressed. First, data gathered from future genealogical and genetic research will undoubtedly determine whether or not genetic counseling can be used as a means of preventing senile dementia. Second, genetics, as a prevention activity, is intrinsically related to the natural history variables, ethnicity and race. Consequently, once ethnicity and race are defined for the population at risk, genetic studies will acquire a new direction, possibly to the point of describing the actual mechanism by which the aberrant gene described by Larsson et al. (1963) is transmitted and activated.

Housing, recreation, overall level of living and working conditions. One solution to the problem of living conditions for the aged in the community is the construction of retirement villages or leisure communities. Ideally, these complexes should provide directed, recreational activities as well as ample opportunity for peer group social interaction.

In addition, the village or community might provide the opportunity for employment of its aged members. Jobs in gardening,
recreational facilities, laundry rooms, cleaning, plumbing, electrical maintenance, television repair, beauty shops, painting, and general upkeep of grounds, could be offered to qualified members of the community who wished to participate in work programs. These part-time occupations would provide a small income to the elderly person, but most important, they would afford an increase in self-esteem, especially since they would supply an opportunity to demonstrate technical expertise and skill.

Day care centers. Another means of caring for the aged in the community is to develop day care centers. Day care centers for the aged have been prevalent in Scandinavian countries for some time, and Britain's National Health Plan has established day care centers as a standard geriatric service. In the United States there are only about a dozen such centers in existence (Horwitz, 1974).

In Maryland, the Bethesda Fellowship House, organized by members of Christ Lutheran Church, offers a limited program to continent, aged persons who are reasonably well, and ambulatory. Other centers across the country offer a wider range of preventive and rehabilitative activities. For instance, the day care facility in Baltimore, Maryland, known as Levindale, offers a highly sophisticated program of care administered in a home for the aged which also is associated with a chronic disease hospital. The On-Loc Day Care Center in San Francisco's Chinatown provides geriatric care to indigent Chinese, Italians, and Filipinos. The facility used for this care is a former, remodeled night club. In contrast, a Durham, North Carolina facility utilizes a church's Sunday School rooms, previously empty on
week days. One day care center in Syracuse, New York specializes in caring for elderly persons recently discharged from hospitals or skilled nursing facilities (Horwitz, 1974).

There are a number of resources, both financial and administrative, available to individuals and groups wishing to organize a day care center. The following example pertaining to the Bethesda Fellowship House illustrates this point. First, the Christ Lutheran Church owned the house in which geriatric services were established. A matching grant from the Maryland Commission on Aging provided additional financial support. Then state funds were combined with federal money under Title 3 provisions of the Older Americans Act (Horwitz, 1974).

According to Horwitz (1974), no Title 3 funds are available for day care at present, but sections of the Social Security and the General Revenue Sharing Acts do provide money for this program in certain cases. The Bethesda project, discussed above, is co-sponsored by six churches and synagogues. Similar centers are highly recommended. In fact, the National Council on the Aging, Inc. (NCOA) has published a comprehensive booklet titled Developing Day Care for Older People (Padula, 1972) which describes the procedures for establishing a day care center. For more specific information on these procedures, see Appendix A.

In the future, day care services for the elderly most likely will become as developed as those presently provided for children. This is especially true, since the percent of the population age sixty-five and over is increasing every year.
Family care plans. Whenever a family is capable and willing to take full responsibility for its elderly members, no particular problem exists. It is when there is no family or when the family lacks willingness or financial capability, that alternative methods of care need to be developed to assist the aged individual.

It has been suggested that the needs of orphaned children are parallel to those of the aged without families. This being true, the solutions applied in the first case, might be applied to the second. For instance, foster homes could be provided for aged individuals in need of a family. In addition, formal adoption procedures might be instituted in selected cases. This would prove beneficial in families without grandparents. However, the attitude toward aging and the aged in the family and society may need modification before such a plan could go into effect. This limitation is by no means insurmountable.

Crisis intervention. Any change in situation produces a crisis, a temporary state of psychic imbalance. Most day to day crises are resolved without supportive assistance. There are, however, some crises which may require professional help before a state of equilibrium can be reestablished. Stress producing situations common among the aged are: (1) loss of a significant other through death or separation, (2) loss of employment either by retirement or termination, (3) relocation, and (4) declining physical and mental capacity. To these one could add the crisis of diminishing self-esteem resulting from failure to maintain a continued level of respect and deference. The capacity of the personality to deal with an imbalance determines
whether or not a crisis can be resolved without professional assistance. Personality development determines this capacity.

There are other variables related to the resolution of a crisis situation. Often emotional support from family and friends is sufficient to help the distressed individual. When this form of aid does not result in psychic equilibrium, the only alternative is to seek professional assistance. At this point, one barrier remains. Preconceived notions concerning psychiatric treatment may interfere with obtaining help.

**Lay counselors.** One way to penetrate this barrier is to develop a corps of lay counselors, which would function in community-based settings. For example, the Suicide Prevention Center trains lay counselors to work on telephone help lines. Also, Alcoholics Anonymous (AA) and Overweight Anonymous (OA) function solely on the basis of self-help groups. There is little argument that Alcoholics Anonymous has achieved success where professional approaches have failed.

Reaching the elderly with crisis intervention techniques may prove difficult. Although there is an increased suicide rate in the elderly (Butler & Lewis, 1973), the number of depressed, aged persons who call suicide prevention centers is low (Gage, 1973). Thus, in order to utilize help lines as a means of crisis intervention for the aged, it will be necessary to investigate the reasons behind this low utilization rate. Most likely the problem arises from a lack of knowledge of available resources. The solution is obviously within the domain of the health educator.
In addition to the use of lay counselors on help lines, lay persons can be trained as counselors who function within the community. Moreover, it would be advantageous to have lay counselors who operate from community based hospitals, clinics, and medical centers, as well as religious and social organizations.

A lay counselor, by virtue of his non-professional status, has the ability to establish a close rapport with his counselee. Thus, he can function as an agent of change, an advocate, and a friend. As an advocate for the aged, the lay counselor intervenes in problems which arise from social assistance, retirement, and disability. As a friend, he acts as a trustworthy confidant, providing a climate for airing problems, and a channel for the reduction of stress (Bonant et al., 1972).

A program for the training of lay counselors has been designed by Bonant et al. (1972). As illustrated in Figure 10, it can be used as a guideline for training lay counselors to work with the aged. If applied to the aged the contents of "Informational Education" would be directed to the problems most often encountered in aged counselees. For a description of the activities involved in this model, see Appendix D.

Pastoral counseling. As a means of crisis intervention, pastoral counseling is becoming more widely used. Most of the major theological seminaries, Catholic, Protestant, and Judaic, offer courses in pastoral counseling. In fact, some universities (e.g., the Memphis Theological Seminary in Tennessee, Claremont School of Theology, the University of Detroit, Iona College in New York, Columbia Theological
Figure 10. Theoretical Training Model for Lay Counselors
Seminary in Georgia, and the New Orleans Baptist Theological Seminary), offer graduate courses and degrees in pastoral psychology and pastoral counseling. Doctorate degrees are offered at Claremont School of Theology and Fuller Seminary in California, Columbia Theological Seminary in Georgia, and New Orleans Baptist Theological Seminary.

A continued emphasis on the importance of this source of counseling is needed. Most important, however, is the recognition by those in need of assistance, that this type of emotional support is available. For the aged, this problem might be solved partially by having a priest, minister, or rabbi visit nursing homes and convalescent homes. The remaining elderly population may be reached through family visitations.

One concept to be understood before establishing this community resource is that the counselee is not required to be of the same religious affiliation as the counselor. This fact can be communicated to community members without religious affiliation by neighbors and friends.

Anticipatory counseling. Crisis intervention is an on-going activity. By its very nature it implies use during crisis, and each individual is confronted with a number of crises throughout his life. It is important to mention that both the lay counselor and pastoral counselor deal with persons of all ages.

To counsel before the fact is to anticipate a counseling need for a future crisis. Thus, a counselor can anticipate that at age 65 his client will require retirement counseling. In order to offset this need, anticipatory counseling can produce viable alternatives to the social isolation of retirement. Post-retirement careers, avocations,
and creative hobbies can be developed before age 65 and mastered after retirement.

The significant points to note in this discussion are:
(1) that crisis intervention should be carried out during all developmental stages of life, and (2) that anticipatory counseling should be practiced by both lay and professional counselors.

Protection from accidents. Health Education courses in schools, grades K-12, and college level courses should include units on the recognition of safety hazards specific to the aged members of the family (e.g., hazards in the kitchen). Furthermore, unsafe conditions at home that could lead to fractures should be investigated. These conditions might be due to poor house maintenance or landscaping.

Secondary Level Activities

Once senile dementia has developed, activities related to early diagnosis, prompt treatment, and disability limitation become important. Specific secondary prevention activities to be discussed at this time are listed below.

Individual and Mass Case-finding Measures
Selective Examinations
Treatment
Disability Limitation

Individual and mass case-finding measures. Activities directed toward identifying new cases of senile dementia include educating physicians, professionals in the community, and the general public.
Physician education. The review of the literature indicated that very little has been accomplished in the area of continuing education for physicians relative to the primary and secondary prevention of senile dementia. Sex was found to be a significant variable to this disease. Women do have a greater risk of developing senile dementia. In addition, a variety of associated characteristics were noted as pathognomonic to this disease syndrome.

These three observations combined establish a foundation for a proposed program of physician education. For instance, given a profile of the type of individual in the high risk group for the disease, it is possible to develop an educational program which will train physicians to recognize susceptible patients and observe closely for early symptoms. Family physicians and gynecologists are two groups of physicians having contact with susceptible patients, women.

Such a program could be conducted as an inservice training course in privately owned hospitals and public hospitals not affiliated with a medical school. Hospitals associated with a medical school, would institute the program in its pilot phase. Feedback, evaluation, and modification would result from the pilot stages of the program.

Establishing this type of program is dependent upon its acceptance by the medical profession. An informal correspondence to this writer from a physician at the University of California, Los Angeles, School of Medicine, revealed a distinct bias against any concept of prevention of senile dementia at the present time (Goldman, 1974). No opinion specific to physician education was given by this physician, although he was confronted with the suggestion of such a
program. Stalwart attitudes might be altered by having a physician conduct inservice training for other physicians. A professor within a University medical school would be a likely candidate for this assignment.

**Educating community professionals.** Certain professionals working in the community have an opportunity to observe the aged. As such, they occupy a valuable case-finding position for symptoms of senile dementia. Specific professionals fitting this description include: social workers, public health nurses, ministers, law enforcement officers, and attorneys. These professionals, and others, should be educated in the characteristics of susceptible individuals and the early signs and symptoms of the disease.

Another source of case-finding is the employer. If an aged individual is permitted to work beyond the age of sixty-five, the employer and co-workers have an opportunity to observe his behavior. Having knowledge of the signs and symptoms and risk factors for the disease, an employer might be able to refer an individual to a staff psychologist or to a family physician.

**Family members as case-finders.** The relatives living with the aged family member have the greatest opportunity for observation and case-finding. Therefore, it is important to execute a program of community health education for the general public. The content of this program should include early signs and symptoms and a profile of high risk individuals.
Additional note. All case-finding efforts are meaningless without an established channel for referral. What is recommended is a referral unit in the community affiliated with a gerontology center or a medical school. Such a center would operate at all three levels of prevention, and would carry out some of the activities described in this paper.

Screening through selective examination. Case histories formulated during selective examinations can be a valuable source of information concerning a disease. However, certain procedures must be followed to ensure uniformity. One way to achieve uniformity in data retrieved from selective examinations is to derive a format for history-taking. If such a standard schema is utilized in each case history, valid comparisons can be made.

Histories of patients with diagnosed senile dementia can be compared with those of patients free of the disease. In order to facilitate these comparisons, a clearinghouse of information must be established. This will provide centralization of data and a complete body of knowledge to be used for analytical and theoretical purposes.

Treatment. In the analysis chapter a number of treatment methods were described. One conclusion can be drawn; there is a need to gather more comparative data concerning treatment methods. Moreover, the effects of different combinations of treatment forms should be investigated and analyzed on an international scale.

One treatment method which seems to be neglected in the psycho-social care of aged patients is the use of birds or animals to reach chronic, withdrawn patients. Stange (1973) obtained positive results
by introducing a mynah bird named "Willie" to aged, withdrawn patients participating in a series of group sessions in a nursing home. This technique is one which should be utilized more often, so that results can be evaluated comparatively.

Limiting disability. Disability may be minimized by environmental manipulation and by recognizing complications when they exist.

Environmental manipulation. Patients in the hospital tend to lose a sense of community unless they are given a home-like environment. Human (1973) observed that coeducational hospital wards have a profound effect on patients. Both sexes become concerned with personal appearance and the atmosphere in the hospital is more home-like. This sense of community tends to reduce isolation and withdrawal, two characteristics frequently leading to disability in senile dementia patients.

Recognizing problems as they arise. The role of the nurse in the psychosocial care of the aged has been stressed. Holtzen (1973) recommended that nurses be trained as constant observers so as to influence the environment positively and to help the aged patient strive for a sense of integrity. Shanck (1973) suggested close observation of elderly patients for yet another reason. She proposed that confusion, apathy, depression, and senility might be the result of unrecognized or untreated communication disorders. Five recommendations aimed at alleviating the problem of unrecognized and untreated communication disorders were made. They include: (1) conducting periodic local workshops sponsored by large medical centers,
(2) recruiting a regional speech therapist to assess and evaluate patients and to instruct staff members, (3) developing the extended care center into a therapeutic community, (4) establishing rehabilitation education for the staff in convalescent hospitals, and (5) utilizing convalescent hospitals as day care centers and out-patient clinics.

In order to assure recognition of problems upon observation, Robinson (1973) suggested that sensitivity groups be established for staff members in convalescent hospitals and skilled nursing facilities. These sessions should help the staff member to become acquainted with the way he affects others with whom he interacts and to understand his own reactions to others.

Tertiary Level Prevention—Rehabilitation

Rehabilitation in senile dementia patients involves a delay of eventual death, and the upgrading of the quality of life until death occurs. This includes reality orientation therapy, remotivation, and preparation for a return home after institutional care.

Upgrading the quality of life. Reality orientation classes are currently being conducted at Edgemoor Hospital in Santee, California. Geri Johnson, a technician at Edgemoor Hospital, claims that there never has been a conscious patient who has failed to respond to reality orientation (Spiller, 1974).

The course is conducted every day for one hour. Reality orientation consists of exposure to names, current dates, the address of the hospital, and pictures and names of common objects, such as a
dress, suit, boy, refrigerator, or dog, shown on flash cards. The names of these items are repeated many times.

Josephine Gumbar, director of nursing at Edgemoor Hospital sums up the entire program succinctly.

Reality orientation comes in concentrated doses in class, but it goes on 24 hours a day every single day in the year. Every staff member, from the groundskeeper to the secretary, and all of our volunteer pink ladies and men know about reality orientation. They call patients by name and talk to them about current events and activities here, such as the dances, movies, Friendship Club, canteen, birthday and holiday parties, all of which keep them living in today's world (Spiller, 1974).

Members of the patient's family are invited to attend reality orientation sessions whenever possible. Hopefully this practice will prevent regression when the patient returns home (Spiller, 1974).

Human (1973) described a resocialization program for the aged which extends beyond reality orientation to remotivation groups of an advanced nature led by the nursing staff. For instance, subjects discussed include gardening, sewing, and current events. In addition, travel slides are shown in some sessions. Musical programs are instituted, and a patient rhythm band is formed along with a singing group. These groups eventually play for patients in local convalescent hospitals.

Another technique utilized in remotivation therapy is the introduction of animal pets into the wards. An immediate therapeutic effect is observed as patients begin to feed and care for their pets. Moreover, to increase interaction among the patients, a "buddy system" is encouraged. Sociability is promoted even further by serving a glass of wine with meals.
Simple techniques such as these, which produce satisfying results, should be carried out in all convalescent hospitals whenever possible. Physical movement, touching, and being touched, as well as describing appearances and actions tends to strengthen an elderly person's ability to deal more effectively with his environment (Blake, 1973). Most of the programs described as resocialization techniques foster such activities in one form or another.

Returning home. Long hospitalization can contribute to an "institutional syndrome," characterized by dependency and a lack of initiative (Chien & Saraf, 1971). For this reason, Conti (1973) recommended the establishment of a community health coordinator for patients in long-term, chronic illness sections of hospitals. The purpose of the coordinator is to assist in formulating discharge plans which provide continuity of care for patients. Under this program all patients discharged to boarding homes and nursing homes are visited once a month, and sometimes more frequently by a registered nurse, licensed vocational nurse, or nursing assistant.

Human (1973) suggested that patients visit a family care home or other community facility before being discharged. This undoubtedly would ease the transfer and possibly prevent transfer mortality and other harmful outcomes.

Preparation for death. A new medical specialty, known as thanatology, deals with the psychosociology of death. Roberts (1973) pointed out that nurses, physicians, psychologists, and social workers all attend to the psychosocial needs of aged patients threatened by death. She
also noted that the problem of death must be faced by the family, friends, and associates of the aged.

Fostering a healthy attitude toward death is of utmost concern since it helps the aged person to develop integrity. At this point, family, friends, and religion provide the best sources of support. In addition, the nurse who is in constant association with a hospitalized patient, may have a profound effect on the acceptance of death as an ultimate outcome of life. Finally, the philosophy of the particular hospital may be an influencing factor in that it would be generated to the entire staff and eventually communicated to the patient.

IMPLICATIONS FOR HEALTH EDUCATION

The foregoing discussion elicited two major areas of opportunity for health education relevant to senile dementia. These include: (1) community organizations to structure a referral center and to establish adoption procedures and foster homes for the aged, and (2) specific health education activities, such as educating physicians and professionals in the community, educating for family life, and training pastoral and lay counselors.

Furthermore, the idea of designing an epidemiological map for variables to senile dementia was suggested. This concept combined with the infectious disease model presented in the literature review (page 82) establishes a communicability theory for senile dementia.

The following describes community organization and health education activities. The framework for the development of a theoretical concept of communicability also is presented.
Community Organization

In order to develop a referral center for individuals in the first stages of senile dementia, and for those having a high risk for the disease, community resources must be structured and organized. First of all, resources in the community such as medical schools, health centers, and gerontology clinics must be identified. With a few modifications in the structure of existing programs, these institutions will most likely provide the backbone for a referral center.

Secondly, the goals and activities of this theoretical referral center must be defined. It is suggested that the primary and secondary prevention activities presented in this paper be utilized as parameters for developing the objectives of a referral center program. Such a community center should function not only on a rehabilitative level, but also on the level of habilitation.

Another level of activity pertinent to such a center is a training program for paraprofessionals working in related community facilities. Therefore, concepts such as reality orientation, resocialization, and remotivation therapy can be transmitted beyond the center to the peripheral areas of a given geographic region.

Organization of social services. The practice of adoption and foster care for young children is well known. However, adoption and foster care for the aged is a relatively new concept, not yet widely publicized. The National Council on the Aging, Inc. advocated establishing day care centers for the elderly, one form of limited foster care. What is needed in some cases, however, is a program to support continued total care of the aged in the community.
Elderly persons without spouses or family are most vulnerable to develop senile dementia (Kay, 1964). This is the group of individuals who would benefit most from some sort of care plan. Both isolation and disengagement thus can be alleviated.

The important point to note is that the aged do possess positive characteristics which can be shared with an adopted family. As a result, adoption of the aged could be both mutually rewarding and profitable. Age-integration studies revealed the rewards of association between the young and the aged (Butler & Lewis, 1972; Kahana & Kahana, 1970). However, before adoption and foster care programs can become a reality, these rewards must be experienced and communicated publicly.

Health Education Activities

Physician education, education of community professionals, family life education, and training courses for pastoral and lay counselors are health educational activities pertinent to the theoretical prevention model presented in this paper. All of these activities have been discussed at one point or another in this paper. Therefore, it is sufficient to simply recognize them as having implications for directed health educational practices, and forego any further discussion.

Developing a Conceptual Approach to Prevention

In the discussion of epidemiologic and demographic factors relevant to senile dementia, it was suggested that an epidemiologic map may in the future be designed, which would account for all of the
variables related to the development of this disease. Such a map would include all mutually exclusive combinations of variables.

Recognizing that certain variables are associated with a high incidence rate for senile dementia, permits speculation as to the communicability of this mental disorder. The infectious disease model outlined by the Committee on Aging of the Group for the Advancement of Psychiatry (1971) as presented in this paper, proposed that illness is "presumably caused by an agent spread through the community by infected individuals." Cultural values related to drug abuse were cited as contagion.

If this model can be applied to drug abuse, then it also can be applied to other forms of deviant behavior, especially those observed in mental illness, particularly senile dementia. Since the capacity of the personality to cope with the neurological and cerebral decrements of the aging process determines whether or not senile dementia develops, personality development should be critically evaluated as a possible infectious agent.

What is suggested here is that long-term associations can affect the development of the personality adversely, especially when these associations result in the learning of incorrect coping mechanisms for crisis situations. If an error in dealing with personal crises persists, often the result of continued exposure to deviant patterns of thought, abnormal personality traits may eventually pervade and incapacitate the personality, making it vulnerable to disease, especially senile dementia.
To summarize, interpersonal relationships can incapacitate the personality when learned responses to stress situations fail to resolve a crisis. Moreover, the concept of communicability of mental illness is preventive from the standpoint of identifying epidemiological variables and mapping their frequency of appearance. Thus, clustering of senile dementia cases into specific demographic and epidemiologic variables suggests communicability by association.

SUMMARY OF RECOMMENDATIONS

1. Epidemiological and demographic variables of senile dementia unexplored at this time should be identified and analyzed for significance of correlation and regression.

2. Primary prevention activities should be stressed in any program of prevention for senile dementia since physical decrements and personality development throughout life have a bearing on the pathogenesis of this disease. In addition, secondary and tertiary activities should be emphasized, especially activities directed toward reducing disability and reversing personality withdrawal (e.g., reality orientation and remotivation therapy).

3. Community resources, such as medical schools, health centers, and gerontology clinics, should be utilized as referral centers in the community providing services related to all prevention levels.

4. A clearinghouse of information concerning mental disorders of the senium should be established similar to the Communicable Disease Center in Atlanta, Georgia.
5. Adoption and foster care plans should be instituted for the elderly. Also day care centers should be provided.

6. Health education activities such as: physician education, education of community professionals, family life education, and training courses for pastoral and lay counselors, are highly recommended.

7. A conceptual approach to prevention must include epidemiologic mapping and a theoretical framework delineating the communicability of factors which produce incapacitation of the personality.

HYPOTHESES

Based upon the formulative research conducted in this paper, two hypotheses have been developed. One hypothesis relates exclusive combinations of epidemiological and demographic variables to senile dementia. The second hypothesis relates a predisposition to senile dementia with exposure to abnormal thought patterns and the learning of unsuccessful coping mechanisms.

Theory of Co-Variable Etiopathology

The epidemiological and demographic variables associated with senile dementia occur in specific combinations in a given population afflicted with this disease.

This hypothesis introduces the concept of epidemiologic mapping or "clustering" of variables. Given appropriate data, it can be analyzed statistically.
Theory of Communicability

A predisposition to senile dementia can be communicated through the continued exposure to abnormal thought patterns which results in learning incorrect coping mechanisms, and unresolved crises.

This hypothesis introduces a theoretical formulation pertaining to the communicability of predisposing factors to senile dementia. Two variables are intricately related in this hypothesis: (1) learning unsuccessful coping methods, and (2) operating psychologically with a reservoir of unresolved crises. The basis for this second hypotheses is the capacity of the personality to compensate for the physical and mental decrements of aging. It is this capacity which ultimately determines whether or not senile dementia develops.

Both of the above hypotheses are conjecture and would benefit from elaboration and specification of variables. The intent here has been to establish the existence of relationships and to state them in the hope that they will be proven at a later date.
Chapter 6

CONCLUSIONS AND SUMMARY

The purpose of this paper was to design a prevention model for senile dementia based upon the available literature. The natural history of this disease was also outlined. The methodology utilized in this project consisted of: (1) a review of the available literature, (2) derivation of a specific natural history pattern for senile dementia, (3) construction of a theoretical prevention model, and (4) exploration of the implications of such a model to activities in community health.

Review of the Literature

An extensive review of geriatric and gerontological literature was conducted. This survey covered three areas: (1) literature defining the aged population, (2) publications describing the characteristics of the aged afflicted with senile dementia, and (3) literature related to the prevention of senile dementia.

Data gathered during this exploratory research included statistics related to epidemiologic and demographic variables, and the clinical aspects of the disease. The data for senile dementia were contrasted in the literature review with baseline information on the characteristics of the aged population without this disease. Finally, literature describing prevention methods and programs was cited.
Methodology

The rationale for the search and retrieval of literature was presented in the research methodology chapter. In addition models used to derive the natural history and levels of prevention for senile dementia were explained, as were variations specific to this paper.

Analysis

In the analysis chapter a complete natural history outline and prevention model were derived. The agent, host, and environment factors in the prepathogenesis of senile dementia were presented, along with the early, intermediate, and late manifestations of pathogenesis. Before the prevention model was outlined, a schematic of the variables and the structure used was given.

Primary prevention activities included in this theoretical model were: (1) nutrition, (2) health education, (3) personality development, (4) genetics, (5) housing, recreation, working conditions and the overall level of living, (6) periodic selective examination, (7) the use of specific nutrients, (8) crisis intervention, (9) protection from accidents, and (10) attention to personal hygiene. The conditions and needs related to physiological, psychological, and situational variables were delineated for primary activities, as well as secondary activities.

Specific secondary activities in the model consisted of: (1) individual and mass case-finding measures, (2) screening surveys, (3) selective examinations, (4) treatment, and (5) disability limitation.
Rehabilitation is the activity pertinent to tertiary prevention. It involves a delay of eventual death, and the upgrading of the quality of life until death occurs. Death was found to occur most frequently from intercurrent infection, injury, or vegetative extinction.

Data gathered from the available literature were incorporated into the theoretical prevention model. Any deficiency of information concerning the variables within the structure of the model was noted and compensated for. Thus, by means of logical deduction variables not appearing explicitly in the available literature were substituted into the model. Hence, a completed prevention model was derived.

Discussion and Recommendations

The principles involved in program development were utilized as the basis for a discussion of the natural history outline and the levels of prevention model presented in this paper. Variables in the prepathogenesis stage of the natural history of senile dementia were explored as a means of defining the target population for a prevention program. These variables included: race, ethnicity, geographic distributions, religion, occupation, personal habits (i.e., smoking, over-eating, and drug abuse), and specific life-styles.

The presentation of the levels of prevention model was discussed in relation to the activities required to prevent senile dementia. The major theme of this section was to expand and elaborate upon the needs and conditions presented in the analysis. The recommendations and suggestions which resulted from this discussion include the following: (1) establishing a visiting health education team, (2) biochemical research and experimentation of specific nutrients,
defining health education needs and goals, (4) promoting activities which foster age-awareness and self-acceptance, (5) constructing retirement villages or leisure communities for the aged, (6) developing day care centers, and family care plans, such as adoption and foster home care, (7) establishing crisis intervention through pastoral and lay counseling, (8) developing a program of home safety with special attention to the safety needs of the elderly, (9) physician education, (10) educating community professionals, (11) creating a clearinghouse of information on senile dementia based upon a standardized format for history-taking, (12) exploring new techniques in treatment, (13) instituting staff in-service training courses, and (14) rehabilitating patients by means of reality orientation and remotivation therapy.

Finally, special problems related to preparation for death were briefly mentioned. The role of family, friends, and professionals was included in this discussion.

**Implications for Health Education**

Community organization to structure a referral center, and establish adoption procedures and foster homes for the aged, are two health educational activities suggested. In addition, two concepts have been delineated: (1) that of designing an epidemiological map for variables to senile dementia, and (2) establishing a theoretical concept of communicability of mental disorder.

**CONCLUSIONS**

Two major conclusions can be drawn at the completion of this project. First, it is possible to develop a theoretical prevention
model for senile dementia based upon the available literature. Second, it is also possible, given this same literature, to outline the natural history of this disease.

As a result of exploring the implications of the prevention model to activities in community health, a number of suggestions and recommendations have been made. Moreover, two new concepts were expounded. First, the design of an epidemiologic map for the variables of senile dementia was suggested. Second, the concept of a theoretical communicability of mental illness was proposed.

A final conclusion pertains to the methodology utilized. Based upon this paper and its formulation of recommendations and concepts, the value of exploratory or formulative research must be recognized. Just as Snow (1855) recognized the need to cure cholera before its cause was discovered, health educators and epidemiologists should explore the possibility of alleviating a problem through natural experiment. Observation and manipulation were Snow's modi operandi. Today, every research problem begins with observation, conjecture, and most important, an extensive review of all information relevant to the subject. Without such a background, experimentation is meaningless.
APPENDICES
Appendix A

FINANCING ADULT DAY CARE

There are several sources where financing for day care is actually and potentially available. Here is a list of programs which have funded some kind of adult day care, along with examples of their currently operating projects.

Office of Economic Opportunity
St. Mary's Hospital and Handmackers Nursing Home, Tucson, Arizona.

Research and Demonstration Projects
Burke Rehabilitation Center, White Plains, N.Y. and Levindale Day Care Center, Baltimore, Md. (both from Social Rehabilitation Service, DHEW).

Older Americans Act, Title 3
Mature Adult Day Care, St. Petersburg, Florida and Day Care Center, Bethesda, Md.

Title 16, Social Security Act
Guilford County Concentrated Social Services Project, High Point, North Carolina.

Hospital Improvement Project
Trenton State Hospital, Trenton, New Jersey and Springfield State Hospital, Sykesville, Maryland

Model Cities Program
Kuakini Home Day Care Center, Honolulu, Hawaii, and Multipurpose Senior Center, Baltimore, Maryland.

Medicaid
Syracuse Psychiatric Hospital, Syracuse, New York.

Source: Padula (1972:52-56)
Here are descriptions of programs through which funding for adult day care is actually or potentially available. Consider using a combination of sources. For example, financing of the social components can come from one place, and financing of the health components from another.

A major resource of OEO is the SOS program in which one emphasis is stimulation and creation of additional services and programs to remedy gaps and deficiencies in the existing service system. Participation of the elderly poor in public services is urged in all projects. Sponsors of SOS programs are Community Action Agencies and organizations directly related to anti-poverty agencies, such as CAA funded neighborhood groups and Neighborhood Service Programs. Other agencies and groups which have a special interest in, and a history of involvement with, low-income persons may act as delegate agencies of the CAA. Such agencies and groups may directly sponsor programs in cases where the CAA cannot or will not serve as sponsors.

Title 19, Social Security Act (Medicaid).
Under Title 19, reimbursement for certain services in a day hospital or for the health components of a day center is possible, depending on the eligibility of the individual and on the state plan. For funding under Title 19, day hospitals must be included in the state Medicaid plan. (In one state, New York, interpretation of regulations for federal reimbursement is particularly favorable. Under the New York State Code, Sub-Chapter H, reimbursement through Title 19 is allowed for certain health services to individuals who are not 24 hour residents of nursing homes.) In day hospitals, reimbursement is possible for the health care part of the program, for social components that are directly supportive of medical services, and for program evaluation. In day care centers, reimbursement may be possible for a small complement of health related services, such as Health Need Case Finding, Health Maintenance, Rehabilitation and Transportation.
Title 18, Social Security Act (Medicare).

A bill which would expand the Medicare program to include day care is pending in the Senate (September 1972). The bill, S3267, introduced by Senator Frank Moss, provides day care services for individuals eligible to enroll in the supplementary medical insurance program for the aged under Part B of Medicare. Currently, if the day care program has medical or health components, reimbursement for certain services is possible under Part B as "hospital services to outpatients." These may be diagnostic or therapeutic. They can be performed off hospital premises, although they must be administered under a physician's supervision.

Title 1 or 16, Social Security Act.

Under Title 1 or 16 of the Social Security Act, federal funds for social services are available on a 75% federal--25% state matching basis. Under these titles, certain social services are mandated by the federal government and are available in all states. Other social services are optional. The federal government funds whatever optional services the state selects on the 75%--25% matching basis also. Day care is one of these optional services. The matching share may be from the state or local government or from voluntary funds. Certain federal money, Model Cities (HUD supplemental) in particular, can be used as the matching share. (For example, the day care program of the Guilford County Concentrated Social Services Project, High Point, North Carolina.) These social services are provided directly by the state or local Department of Social Services, or by a purchase of service arrangement. Local service agencies can participate through the local DSS. The state can develop a written agreement with agencies in each local community presently equipped to provide any of the mandated or optional services available under the Adult Service Regulations of the Social Security Act as outlined in the state plan. Contact your local or state Department of Social Services for further information on Title 1 (in states which operate older adult services separately from the blind and disabled) or Title 16 (in states which operate a combined adult program).
Title 3 (Community Programs) Older Americans Act.

In every state the state unit on aging administers funds from Title 3 of the Older Americans Act. These funds are for local planning and provision of social services primarily in selected areas within a state. Within these selected areas, Title 3 money can be used to finance adult day care. Several existing day care programs have been funded through Title 3.

Model Cities Program.

Model Cities can fund adult day care by using Department of Housing and Urban Development supplemental funds wholly to support the program or by developing a cooperative agreement with the state to use Title 1 or 16 money in which Model Cities would provide the matching share. In effect, this permits federal money—instead of state—to earn more federal money. Thus, even if the state lacks the resources to establish certain services, the CDA can provide the state-local share. The day care program of the Guilford County Concentrated Social Services Project, High Point, North Carolina, is funded through Title 16 in which Model Cities funds were used as matching. Such services can be delivered directly by the state agency or through a purchase of service arrangement.

Community Mental Health Centers.

Under Public Law 91-211, a day hospital is a required ingredient for federally supported Community Mental Health Centers. It is referred to under the general category of "Partial Hospitalization." There are 400 Community Mental Health Centers now operating with a total budget of more than $135 million.

Hospital Improvement Program.

State mental hospitals can use Hospital Improvement Program money to fund day care. HIP is part of the Public Health Services Act, Section 301C and D (Hospital Staff Development 303a). The program, through which federal funding is available for as long as 10 years before the state must absorb the total cost, is administered through the Department of Health, Education and Welfare, National Institute of Mental Health.
Title 7 (Nutrition Program for the Elderly), Older Americans Act. The Nutrition Program for the Elderly is about to be implemented. There is nothing to exclude the possibility of some cooperative arrangement by which the nutrition aspect of day care could be supported by Title 7. For further information, contact your state unit on aging.

Research and Demonstration Projects. This year three day care centers and a day hospital were funded by research and demonstration money administered by the Social Rehabilitation Service (SRS) of the Department of Health, Education and Welfare. A few more day care projects may be funded in the next year. These grants represent the combined resources of several different laws or titles of laws administered by SRS which provide for research, demonstration and development, including Title 19 of the Social Security Act and Title 4 of the Older Americans Act, among others.
Appendix B

PARTIAL LIST OF DAY CARE CENTERS IN OPERATION*

Day Care Centers
Located in Senior Centers
or Operated Independently

Center for Adults Plus, New York, N. Y.
See bibliography: Berger and Flexner.

*Metropolitan Senior Citizens Center, Baltimore, Md.
See reference in text (page 10) for project with
Baltimore City Hospitals. Funded under the Older
Americans Act, Title III. Administered by social
worker. Component of future multi-purpose senior
center (Waxter Center) now under construction.

*Richmond Community Senior Center, Richmond, Va.
Recently submitted for funding under Older Americans
Act, Title III, and State Urban Assistance Incentive
Fund. Protocol is especially readable and useful,
containing a sample one day program, physician's
form, staff job descriptions. Although located in
the same building with a Senior Center, it is
physically and administratively separate.

*Mature Adult Day Care, St. Petersburg, Florida.
Part of the Neighborly Center, Inc. Separate
nutrition program another component of operation.
Funded under Older Americans Act, Title III.

Multipurpose Senior Center, Baltimore, Md.
Day care with health services available in
an active, diversified program. Located in
the inner city. Administered by nurse. Funded
by Model Cities.

Day Care Center, Bethesda Fellowship House, Bethesda, Md.
Recently funded under the Older Americans Act, Title
III, with facilities made available by the Lutheran
Church.

*Facility has useful written material available upon request.

Source: Padula (1972:58-60)
Partial List of Day Care Centers in Operation

Day Care Programs
in Homes and Hospitals for the Aged
and in Nursing Homes

*Baycrest Center for Geriatric Care, Toronto, Canada.
Located in Jewish Home for the Aged and Baycrest Hospital. Thoughtful presentation of development and problems of such a program available. (See bibliography: Lyons.)

*Levindale Day Care Center, Baltimore, Md.
Located in a home for the aged which also has chronic disease and skilled nursing care facilities and cooperative relations with Sinai Hospital. (See bibliography: Kostick.) Recently received a grant for a sophisticated research and program evaluation project from Social Rehabilitation Service Department of Health, Education and Welfare.

Kuakini Home Day Care Center, Honolulu, Hawaii.
Located in hospital and home for the aged. Good brochure. Funded by Model Cities.

*Maimonides Hospital and Home for the Aged, Montreal, Canada. See bibliography: Novick and also Goldstein.

Valley Crest, Luzerne Co., Penna.
Located in a nursing home and rehabilitation center. Interesting article in bibliography: Stauffer.

St. Mary's Hospital and Handmackers Nursing Home, Tucson, Arizona. Two separate programs, both under the auspices of Health Center Day Care. Funded by the Office of Economic Opportunity. Evaluation of program underway.

*Facility has useful written material available upon request.
Partial List of Day Care Centers in Operation

Day Care Programs
under the auspices of State Mental Hospitals

Cherry Hospital, Goldsboro, North Carolina.
Located in a cottage on the grounds; serves patients within the hospital. Developed under the leadership of Dr. Lionel Z. Cosin. See bibliography, especially testimony before Senate Committee.

Springfield State Hospital, Sykesville, Md.
Located in a screened off section of the geriatric building; serves patients within the hospital. Funded as a Hospital Improvement Project, National Institute of Mental Health.

Trenton State Hospital, Trenton, New Jersey.
Located on two floors of a patient building on the grounds; serves both patients within the hospital and the community.

Syracuse Psychiatric Hospital, Syracuse, N. Y.
Two day care programs for community residents, one located in a house close to the hospital but not on the grounds, and the other in a public housing project. Medicaid pays part of transportation costs and application made to include reimbursement of per diem costs. See bibliography: MacDonald.
ORGANIZATIONS PERTAINING TO THE ELDERLY

American Aging Association
University of Nebraska Medical Center
Omaha, Neb.
Made up of scientists, it seeks to promote research in aging.

American Association of Homes for the Aging
529 14th St., N.W.
Washington, D. C. 20004
AAHA represents the nonprofit homes for the aging—religious, municipal, trust, fraternal.

American Association of Retired Persons
1225 Connecticut Ave., N.W.
Washington, D. C. 20036
Age 55 or above, retired to still-employed.

The American Geriatrics Society
10 Columbus Circle
New York, N. Y. 10019
The American Geriatrics Society, made up of physicians, has an annual meeting.

American Nurses' Association, Inc.
10 Columbus Circle
New York, N. Y. 10019

American Nursing Home Association
1025 Connecticut Ave., N.W.
Washington, D. C. 20036
ANHA represents the commercial nursing home industry.

American Occupational Therapy Association
251 Park Ave. South
New York, N. Y. 10010

American Physical Therapy Association
1740 Broadway
New York, N. Y. 10019

The Forum for Professionals and Executives
c/o The Washington School of Psychiatry
1610 New Hampshire Ave., N.W.
Washington, D. C. 20009
The interests of this group have ranged from contemplation to active examination of public issues, including those affecting the elderly.

The Gerontological Society
1 Dupont Circle
Washington, D. C. 20036
This professional society has an annual meeting and an international meeting every three years. It is made up of four components—Biological Sciences, Clinical Medicine, Psychological and Social Services and Social Research, Planning and Practice.

Gray Panthers
6342 Greene St.
Philadelphia, Pa. 19144
Activists group of old people who resent "stereotyping."

The Institute of Retired Professionals
The New School of Social Research
60 West 12th St.
New York, N. Y.
This pioneering school also led the way in providing intellectual activities for retired professional people.

The Institutes of Lifetime Learning
These are educational services of the National Retired Teachers Association and the American Association of Retired Persons.

International Senior Citizens Association, Inc.
11753 Wilshire Blvd.
Los Angeles, Calif. 90025
Endeavors to reflect old people of many nations.

National Association of Retired Federal Employees
1909 Que St., N.W.
Washington, D. C. 20009
Represents and lobbies for needs of retired civil servants.

National Association of Social Workers
2 Park Ave.
New York, N. Y. 10016

National Council on the Aging
1828 L St., N.W., Suite 504
Washington, D. C. 20036
Research and services regarding the elderly.

Source: Butler and Lewis (1973:282)
National Council of Health Care Services
407 N St., S.W., Washington, D.C.
*Represents commercial nursing home chains.*

National Council for Homemaker Services
1790 Broadway
New York, N.Y. 10019

National Council of Senior Citizens
1911 K St., N.W., Room 202
Washington, D.C. 20005
*Represents and lobbies for needs of the elderly. Membership at any age.*

National Federation of Licensed Practical Nurses
250 W. 57th St.
New York, N.Y.
*Educational Foundation.*

National Retired Teachers Association
1225 Connecticut Ave., N.W.
Washington, D.C. 20036
*Members once active in an educational system, public or private.*

National Tenants Organization, Inc.
Suite 548
425 13th St., N.W.
Washington, D.C. 20004
*Represents old people, among others, in public housing.*

The Oliver Wendell Holmes Association
381 Park Ave., South
New York, N.Y. 10016
*This group is interested in the expansion of the intellectual horizons of older people.*

Retired Professionals Action Group
Suite 711
200 P St., N.W.
Washington, D.C.
*This action group was organized through Nader. Its efforts include investigative reports and class-action cases.*

Urban Elderly Coalition
c/o Office of Aging of New York City
250 Broadway, New York, N.Y.
*Efforts of municipal authorities to obtain funds for the urban elderly poor.*
Appendix D

OUTLINE OF TRAINING MODEL FOR LAY COUNSELORS

A. Informational Education--is under the jurisdiction of the clinical psychologist and/or psychiatrist and includes:

1. teaching basic interviewing techniques i.e., instructions in small, specific, and important skills

2. teaching about case planning and management strategies (identifying appropriate ways to help clients set up objectives and to know how to introduce behavioral styles enabling the client to achieve his goals)

3. instructions in analyzing client behaviors (antecedents and maintainers of behavior and the dynamics of group interaction)

4. teaching to identify which behaviors need to be changed or acquired

5. learning the relationship between techniques and strategies used and the outcomes

6. helping the "volunteers" to see themselves as agents of change

7. training in First Aid: especially for suicide attempts
   a. learning what procedures are authorized and/or required by the clinic in emergency situations, e.g., removal to emergency hospital or gastric lavage
   b. learning general "psychological" crisis intervention

B. Role Playing (before and after observation)

1. consists of interacting with other trainees and paraprofessionals (experienced counselors with college degrees but no license) in the role of counselor and client

2. experience should be gained in the interactions of individual counseling and group counseling

C. Observation

1. watching the interplay of counselor and client for a number of different cases

Source: Bonant et al. (1972)
2. Observation may be fulfilled by the use of video tape as well as observing live counseling sessions, and should include group, individual, and telephone counseling.

3. The paraprofessional will assist in answering any questions which arise from observational assignments.

D. Supervision

1. Guidance during actual counseling sessions from the paraprofessional who is trained and experienced in counseling techniques.
REFERENCES


