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Title: A Comparison of the Health Status of Incoming Freshmen at Oregon State University From 1930 to 1960

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The data gathered for the study of the health status of freshmen at Oregon State University were derived by an analysis of health history records. These were obtained from the Oregon State University Health Service. The years sampled were 1930, 1940, 1950 and 1960; 300 freshman male and 300 freshman female names were chosen at random for each sample year, giving a total of 2400 students studied. The data for each sex were computed separately.

Final statistical evaluation was based on range, mean, and standard deviation of the data gained. This gave an average image of the female and male freshman students for each year studied.

Included in the study were certain data pertaining to the health status of the student's parents and relatives.

Findings

The following findings were found in an analysis of the data

gathered in the research.

1. Both female and male freshmen show a gain in height and weight with each succeeding year sampled. The greatest mean height was in 1950 and the greatest mean weight was in 1960.

2. While there was a leveling off or decrease in the incidence of communicable diseases, essentially the severe ones, there appeared an increase in non-communicable diseases.

3. Mothers and fathers of freshman students are getting younger. While there is still some difference in age, the father's mean age is approaching that of the mother's.

4. Data on relatives show a decrease in reported cases of tuberculosis. Heart disease, cancer and diabetes all increased greatly, with diabetes showing the greatest percentage of increase.

Conclusions

1. Freshmen at Oregon State University are gaining in stature and future generations will probably be heavier and possibly taller.

2. Freshmen at Oregon State University are healthier in the sense that they have a lower case incidence of the communicable, more common severe diseases. However, their chances of developing non-communicable diseases are increasing.

3. The parents of Oregon State University freshmen are successively younger with each decade.

4. If the trend indicated in the study continues relatives of freshmen at Oregon State University will experience an increase in the incidence of organic diseases.

Recommendations

Criteria for health status should be established and health record cards should be designed to reflect these criteria.

Other studies should be initiated to provide comparisons with this study. In this way up-to-date norms can be established for local, regional and national utilization.

A Comparison of the Health Status of Incoming Freshmen at Oregon State University from 1930 to 1960

by

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CHAPTER I

INTRODUCTION

Much has been said about the changes in man brought about in his environment and how these changes have affected individuals. Medicine and public health have contributed significantly to the physical development and healthful well-being of America's citizenry. What physical and health changes have occurred over a 30 year span in college freshmen is investigated in this study.

Reflecting upon health improvements or change, it would seem that college students might be the best source of data needed to determine the present health status of this generation or those of the past. They have survived the childhood diseases and are a product of 12 years of educational preparation. While it is recognized that they do not represent the population as a whole, they do represent a constantly growing segment of our young people.

Since the income required to send a student to college is usually above average and the family one of middle class or upper class status, it is assumed that the cultural, family background

would be one that would reflect better medical care and treatment. It is further assumed that with the increased income would be an increased desire and ability of the parents to purchase needed medical care and other services in rearing healthier children.

Associated with increased income and social status is a corresponding increase in education. If the parents of college students reflect greater occupational training and education, they more likely would better control the environment of their children. Thus this study should reflect optimal health conditions in terms of student growth and health.

Also, it seemed important that those who deal with our college age youth, such as administrators, teachers, physicians and counselors, would be better served if they had accurate information to guide them in their decisions and judgments.

Generally, the largest single group of students in a collge or university is the freshman class, therefore, it was decided for this study to use entering freshmen as subjects. The advantages of studying freshmen are many. Most important, they must have had a recent medical examination (an entrance requirement) and the information would be current. Also, by studying enrolling freshmen it is not necessary to be concerned about dropouts or transfer students that might produce an undesirable variable in any study of upperclassmen.

Since the investigator was on the Oregon State University campus it was logical to limit the investigation to the study of enrolling freshmen at that institution. The purpose of the study was to attempt to identify the health status of present Oregon State University freshmen of previous representative years. It was hoped that if the health status of Oregon State University freshmen was changing such changes could be identified and documented. Not only was it important to identify observable changes but also to chronicle the present health status of freshmen students for future studies.

An incidental value of the study was an attempt to assess the health status of relatives of Oregon State University freshmen. It is recognized that college-bound youth might make up a somewhat selective category, but there is justification for assuming that their relatives might provide a more accurate reflection of the health status of the general population as well as the health status of previous generations.

Summary

This study and thesis are based upon the hypothesis that the height, weight, health status and health histories of freshmen entering Oregon State University change from decade to decade. There is a further assumption that to know the nature of these changes can be of value in understanding students and in predicting what changes will occur in the future.

CHAPTER II

DESIGN

Essential to the accuracy of the proposed study was a valid and reliable source of information about the health of the individual freshman of the representative classes to be studied. In this case it was felt that the health history records required by the Student Health Service for each enrolling freshman would offer the most accurate and consistent information available.

The Oregon State University Student Health Service consented to allow the investigator to use the files of students who were no longer enrolled at Oregon State University. It was felt that to use record cards of those presently enrolled might be a possible violation of confidential information. However, since names were not a part of the data desired and only statistics were of value, the people whose cards were used remain anonymous.

Investigation showed that the Student Health Service has required some type of medical profile, or health history, since 1929. The early cards were generally not filled out by family physicians but by college doctors after the student enrolled as a freshman. More recent cards were filled out by family physicians.

Since the cards dated back to 1929 and were as current as the freshman class of 1960, it was decided to take a random sample of

the cards over a 30 year period from 1930 to 1960. It was further decided to sample each ten years, in the belief that more frequent samplings would not produce more valid findings, yet the ten year samples would allow accurate reflections of changes and trends toward change. The years to be sampled were 1930, 1940, 1950 and 1960.

Obviously any study of freshman health must resolve itself into two separate, yet identical studies, those of freshman females and those of freshman males. The two groups were studied together in the year categories chosen. Although data were accumulated about each group they were not combined statistically. The data represented a separate study of each sex.

In order to gain a representative number of student cases, it became necessary to find out how many freshmen were enrolled in the years under study. Investigation showed that total enrollments for the selected years to be; 1930 - 1319, 1940 - 1652, 1950 - 1664, and 1960 - 2450. Total numbers of students to be sampled were to give results at the one percent significance level. After consultation with the Oregon State University Statistics Department, it was decided to select an exact number from each year to be studied. The number was a total 600 students from each class which would approximate half of the 1930 class, one-third of the classes of 1940 and 1950, and one-fourth of the class of 1960. The total number of

student histories to be studied and analyzed would be 2400.

It was further decided to select 300 names of freshman females and 300 freshman males for each year under study. The names were to be selected in a random method from the student directory for the years 1930, 1940 and 1950. The names used for 1960 came from an IBM class sheet provided by the Registrar's Office.

The method of random selection was to divide the total pages of the student directory, or list, into the needed 300 names of females and males for the selected year. It was then possible to determine how many freshman names to choose from each page. This method of random selection was suggested and approved by Dr. Lyle Calvin of the Oregon State University Department of Statistics.

After the appropriate number of names was chosen, ten additional names were added to the list. The extra names were to be used in case the medical histories were missing, incomplete or unusable.

Using the selected names from the student directory and IBM sheets the investigator then began matching the names against the health history cards found in the files of the Student Health Service. Each name was correctly matched with the duplicate name for the year studied. This was done on a year-by-year basis.

In attempting to decide which information was to be used, the

information from all the years under study was analyzed. There had been some changes in the forms used and certain categories appeared inconsistent with those on previous cards. The information that could not be used throughout the study was discarded. Only items that appeared on the early 1930 cards and consistently give information through the 1960 cards were used. Also, some items of information were ignored since they did not seem to indicate the general status of student health or otherwise would not add to the desired information.

As the appropriate medical history file cards were accumulated they were submitted to a trained key punch operator, provided by the Oregon State University Department of Statistics. The operator scanned the cards for the information to be tabulated and translated this into the pre-selected code to designate the information to be gained. Complete translation to the punch cards was made. At times the operator would rerun an occasional card to check the accuracy of the operation.

After the 300 female and 300 male, plus the ten extra cards, were completed for a given year the original medical history cards were then returned to the Student Health Service files. The key punch cards, containing the desired data, were then submitted to the Department of Statistics computor laboratory for tabulation and analysis.

Inasmuch as the desired information was to be analyzed item by item, it seemed advisable to tabulate and place the information on a frequency table to identify the range of the item. Since the investigator was dealing with the health profile for the total number of students in a given year, it appeared advisable to total the responses to determine the mean response and those within one standard deviation from the mean. This, in effect, gave a statistical health profile of the average student, male and female, for the year. It also allowed comparison of changes from one decade to the next as well as categorical breakdowns. For example, it was now possible to compare the height and weight of the average student for each year studied with that of any other year studied, and to know the individual year's average height and weight.

Summary

Years selected for the study were 1930, 1940, 1950 and 1960. Student health history cards were drawn from the Oregon State University Health Service numbering 600 per year, 300 female and 300 male freshmen. The information on the cards were analyzed and recorded on key punch cards for tabulation by the computor laboratory of the Department of Statistics. The information was charted to give range, mean and standard deviation, thus giving a composite picture of the average student and variations found within the total tabulation.

CHAPTER III

HEIGHT AND WEIGHT OF FRESHMEN

Perhaps the most important knowledge gained from this study is the information on the changes in size of Oregon State University freshmen. This knowledge is not only of value to those working with Oregon State University students but also to those looking for correlations or trends that may reflect the size of college freshmen across the nation.

A study of the literature in the area indicates a great need for more information on height and weight of all people, a point upon which other researchers agree (41; 87). Present day medical charts and tables are often based on a limited statistical study done in 1912 (68). The well known Meredith Study was done in 1941 and restricted to children from 9 to 14 years of age, therefore of limited use as a resource (65). Revisions of Meredith's original study are still limited to children in elementary and high school in Iowa. While charts have been designed from his data, their design is to indicate body growth ranges, they do not duplicate the desired norms needed for comparison in this study (66). Boyle's study of Harvard men, published in 1932, was based on observations taken during the years 1870 to 1917 (45).

Although data relating directly to the height and weight of college freshmen was not to be found, some studies of these measurements as they apply to the general population will be used for comparative purposes. Therefore, the data from Selective Service exams, studies by Millicent L. Hathaway and statistical reports of the National Center for Health Statistics will be used because they approximate some of the data found in this study.

A word of explanation is in order about the height tables found in the Appendix. Although height was grouped into categories of five inches, for convenience in establishing ranges, the statistical mean and standard deviation are based upon the total sums of all the observations, independent of the range groupings. Insofar as the data on the individual health cards are correct, so too, is the information on the height charts. Grouping into one inch, or two inch ranges would have given greater spread to the tables, but would not have affected the summation of the data.

While there is much empirical observation about the stature of today's college student, it would appear that much of this is based on incomplete studies or attention to the extremes. Comments such as, "Today's kids are sure taller, look at the basketball teams...", or "My son is only 14 and he's already as tall as I am", have led to faulty generalizations about the stature of the present generation.

To be sure, today's freshman at Oregon State University is

taller, but perhaps not as much taller than previous generations as many may think. A careful look at the statistical data will give us an accurate idea of just how much taller today's freshmen are.

Table 1. Height of a sampling of female freshmen at Oregon State University, in inches, for years, 1930, 1940, 1950, 1960

Year	Height Range	Mean	Standard Deviation
1930	56 - 70	63.60	2.21
1940	46 - 75	64.09	2.54
1950	51 - 80	64.85	2.72
1960	46 - 80	64.04	3.68

Examination of the table for the freshman female shows the mean height of the base year, 1930, as 63.60 inches with a standard deviation of 2.21 inches. The final year studied, 1960, indicates the mean female height to be 64.04 inches, with a standard deviation of 3.68 inches. Based on this information it would appear that the freshman female at Oregon State University has an average increase in height of .44 inches during the 30 year interim. It would further indicate that the freshman women of 1960 have a wider variety of heights than their predecessors. Not only is the standard deviation, 3.68 inches, greater, but the range from 46 to 80 inches is considerably wider than those of 30 years ago.

An interesting comparison is the data given for females taken

by the Work Projects Administration (W. P. A.) in 1940, stating that the mature female height average was 63. 2 inches, and the data collected by the Women's Army Corps (W. A. C. 's) during World War II, showing the average height to be 64 inches (81). Table 1 reflecting the average Oregon State University freshman female for comparable years, 1940, indicates that she was 64. 09 inches, or taller than the average female in either of the two mentioned studies.

Offering contrast is the study by Hathaway of college students at various institutions in the United States. Averages for females in given years were as follows: 1928-30, 64. 5 inches (Stamford); 1940-47, 64. 6 inches (Arizona); 1950-51, 65. 1 inches (Montana) (42). Utilizing the data for female freshmen at Oregon State University it would appear that their means are somewhat shorter than those of the Hathaway study. Hathaway states that, "...(in 1960) women average 64. 5 inches, ... compared with 63. 5 to 64. 0 inches in 1920's" (41). However, when relating the two studies it would be well to remember that this one is only concerned with freshman females while the Hathaway data encompasses sample females from all of the undergraduate classes. It is possible that freshman females would continue to grow during the subsequent three years.

Height data on Oregon State University male freshmen show a mean of 68. 65 inches in 1930. The 1960 data indicate a mean height of 70. 05 inches or a gain of 1. 40 inches over the base year, 1930.

There was also a gain in standard deviation of 3. 24 inches for 1960, compared to 2. 51 inches for 1930, as well as a widening of the total height range. The data would indicate the 1960 Oregon State University freshman is taller, on the average, and has a greater range in heights than his predecessor of 30 years before.

Table 2. Heights of a sampling of male freshmen entering Oregon State University, in inches, for years 1930, 1940, 1950, 1960

Year	Height Range	Mean	Standard Deviation
1930	61 - 80	68. 65	2. 51
1940	61 - 80	68. 98	2. 39
1950	56 - 81+	70. 42	2. 78
1960	56 - 81+	70. 05	3. 24

Selective Service System norms for males examined during World War II established the average male height at 68. 5 inches (81). A report of the 20 to 29 year-old men examined at induction centers in May of 1943 gives the average height as 68. 15 inches (38). In both cases if we apply the 1940 data for the Oregon State University freshman male we find his norm to be 68. 98 inches, decidedly above the national averages quoted in the Selective Service Reports.

The study done by Hathaway gives the following height data for males in the comparative years: 1928-30, 69. 2 inches (California); 1945-47, 70. 5 inches (California); 1950-51, 69. 8 inches (Montana)(42).

Hathaway states that, "...(in 1960) the average height of men who have reached maximum growth is now nearly 70 inches compared with 69 inches around 1925" (41). Hathaway's norm heights for 1960 are almost identical to those of the freshman male at Oregon State University.

It would seem apparent that improved socio-economic status allowing greater availability and consumption of nutritious foods along with better medical care and an increase in desired health habits has helped Oregon State University freshmen to increase their mean heights over those of 30 years ago. This hypothesis is shared by Hathaway (41) and Bakwin (4).

Table 3. Weight of sampling of female freshmen entering Oregon State University, in pounds, for years 1930, 1940, 1950, 1960

Year	Weight Range	Mean	Standard Deviation
1930	81 - 200	121.70	15.92
1940	86 - 210	125.94	17.81
1950	91 - 220	128.25	17.75
1960	86 - 205	129.07	18.66

Table 4. Weight of a sampling of male freshmen entering Oregon State University, in pounds, for years 1930, 1940, 1950, 1960

Year	Weight Range	Mean	Standard Deviation
1930	106 - 205	145.28	20.05
1940	96 - 230	153.22	20.34
1950	111 - 240	161.29	20.28
1960	106 - 245 (290)	161.32	23.03

NOTE: A single weight of 290 pounds was shown for 1960.

Weight statistics for Oregon State University freshmen are strikingly similar to those of the height tables. Using the base year 1930 for comparison, it can be seen that the freshman female shows an increase mean weight of 7.37 pounds to the year 1960. The male has an increased mean of 16.04 pounds for the 30 year study. Equally important is the standard deviation increase for both the freshman female and the freshman male.

Again utilizing Hathaway's study and the same years as used in the data for heights it is possible to compare the results of both studies. For females in the following years Hathaway reports; 1928-30, 125 pounds (Stamford); 1940-47, 122.8 pounds (Arizona); 1950-51, 121.7 pounds (Montana) (42). It would appear that the females included in Hathaway's studies are getting lighter while the female freshmen at Oregon State University are getting heavier over

the 30 year period studied.

For the males Hathaway reports the following: 1928-30, 142 pounds (California); 1945-47, 154. 8 pounds (California); 1950-51, 156. 1 (Montana) (42). Freshman males at Oregon State University reported a greater gain in weight for the years under comparison than do those in Hathaway's study.

It is worthy of note that a study done by the National Center for Health Statistics indicates that the average weight for females between the ages of 18-24 years, and 64 inches tall, is 126 pounds; that the average weight for males between the ages of 18-24 years, and 70 inches tall, is 165 pounds. It would appear that for the freshmen at Oregon State University the females are approximately three pounds over the national norms, and the males approximately four pounds under the national norms.

If one were to establish a ratio comparing the average height increase and the average weight increase for the years studied it would look something like this: ratio for the freshman female is 16. 07 pounds per inch increase; ratio for the freshman male 11. 45 pounds per inch increase. In either case, it would appear that the recent generations of freshman students at Oregon State University are considerably heavier and somewhat taller than earlier generations.

Speculation as to whether this is a healthy trend or even desirable would seem to require more data, such as physiomorphological

typing, skin-fold testing and other measures relating to obesity.

Summary

Data presented in the study indicate that the mean height for the Oregon State University freshman female in 1960 is .44 inches, and for the freshman male 1.40 inches, over the mean heights of similar students in 1930. The freshman female now measures an average of 64.04 inches, the freshman male an average of 70.05 inches.

Compared to national norms for given years it would appear that Oregon State University freshman students are somewhat taller than those for whom the national norms were established (97).

The data show a very strong weight increase for both the freshman female and the freshman male studied. The male added an average of 16.04 pounds for an average weight of 161.32 pounds, over the 30 years studied. The female added an average of 7.37 pounds, for the 30 years studied, bringing the norm weight to 129.07 pounds.

The fact that the students sampled are taller and heavier than their contemporaries seems well based. How much their stature will increase is open to speculation and may be resolved by other follow-up studies, adding to the information gained in this thesis.

CHAPTER IV

STUDENT DISEASE HISTORY

Since man frequently seeks insights into the future by looking to his past, so too it may be possible to predict disease trends and potential by examining the disease chronology and patterns as revealed by the Health Service records. Although student response to the questions of previous medical histories may not be fully reliable this study provided a rare opportunity to chart the diseases the students would admit.

In evaluating the data one must keep in mind the potential of diagnostic errors causing some response distortion. Not all the data found were used in the study. It was decided that the value in knowing the number of cases of running ear, mumps, St. Vitus Dance and others, was inconsequential. Diseases that were potential killers, epidemic in nature, or possessing special unique factors, were thought to be important to the study.

Diphtheria

A disease that at one time was epidemic in the world (63, p. 222), diphtheria is caused by a pathogenic bacterium that emits metabolic toxins destructive to certain tissues and cells in the human body.

Table 5. Diseases in histories of a sampling of male freshmen entering Oregon State University (Number reporting each disease).

Diseases	1930	1940	1950	1960
Diphtheria	16	11	1	0
Small Pox	48	36	9	8
Mononucleosis	0	0	0	5
Hay Fever	10	37	32	62
Asthma	0	4	19	20
Pneumonia	38	39	49	43
Tuberculosis	0	1	1	0
Tonsillitis	169	88	96	107
Rheumatic Fever	0	0	1	5
Pertussis	199	183	153	2
Epilepsy	0	0	0	0

Table 6. Diseases in histories of a sampling of female freshmen entering Oregon State University (Number reporting each disease).

Diseases	1930	1940	1950	1960
Diphtheria	12	10	1	1
Small Pox	31	25	2	6
Mononucleosis	0	0	1	12
Hay Fever	17	14	46	41
Asthma	1	3	19	9
Pneumonia	31	36	33	28
Tuberculosis	1	2	1	0
Tonsillitis	186	106	113	147
Rheumatic Fever	0	0	8	9
Pertussis	229	215	202	3
Epilepsy	0	0	1	0

Spread through discharges of the nose and throat the disease may be controlled by techniques of personal sanitation and hygiene, and most effectively by immunization.

Since the introduction of the diphtheria antigen immunization in the early 1920's (5), more recently combined with other antigens, the number of cases of diphtheria has dropped off rapidly. Most youngsters in the United States receive their D. P. T. (diphtheria, pertussis, tetanus) shots within the first six months of life.

Data for Oregon State University freshmen indicate almost a complete disappearance of the disease. Both female and male freshman incidence is similar for the years studied. The year 1940 shows a tapering off of the disease from 1930, while the year 1950 has only one case reported for each sex. The year 1960 shows only one case for the female and none for the male freshmen. This data agrees with that of Lang where he states, "The number of cases has decreased from 40. 2 per 100, 000 in 1933 to 0. 5 per 100, 000 in 1960" (59, p. 1093).

It would appear that the widespread use of the D. P. T. vaccine must have been initiated in Oregon between the years 1920 and 1930. Children who were born then grew up without the former concern for the once dread disease. Those who were not vaccinated, were protected from the disease spread by those who were.

Smallpox

A disease that spreads from discharges of nose and throat, smallpox has been called, "the greatest single scourge of the (18th) century..." (63, p. 222). Today, no cases of it have been reported in the United States for five years. However, it is somehow ironic that the disease which brought about the fame of Edward Jenner and vaccination was included as a part of this study (53).

Although the incidence for the female students and the male students are not identical, in effect, they show the trends and changes from 1930 to 1960. There was a sharp drop in cases reported from 1930 to 1950 for both sexes. Again, we might look to immunization practices of the previous two decades.

A somewhat surprising statistic is represented in the failure of the number of smallpox cases reported to drop significantly from 1950 to 1960 in the males sampled. Worse is the data for the freshman females indicating an increase of four cases from two in 1950 to six in 1960. Neglect could mark future smallpox outbreaks. Candau, reporting on smallpox outbreaks, said, "Over 160 years ago, vaccination was first shown to prevent this disease; but we have failed to make full use of this weapon" (19, p. 194).

Mononucleosis

Sometimes called the "kissing disease" or "great masquerader," and in the 19th century known as "glandular fever", mononucleosis is a disease held responsible for a lot of illness, especially among people of college age (58). Often appearing under the guise of infectious hepatitus, mumps, measles, diphtheria, influenza, scarlet fever, undulant fever, or appendicitis, the disease is one which in the past must have been missed in the diagnoses by physicians (94). Although in the 1930's doctors developed a simple laboratory test that can lead to correct identification of mononucleosis (95), it would appear that a consistently correct diagnosis is relatively recent.

Medical histories at the Health Service indicate no cases of mononucleosis among Oregon State University freshmen during the years 1930 and 1940 and only one case in 1950. These raw data would make it appear that the disease was not present a generation ago. In the light of earlier problems of diagnosis, it would seem possible mononucleosis existed but was missed. Knowledge of human nature and the dating practices of generations of college youth would suggest this was likely. The British Medical Journal reports, "...many outbreaks have been reported, especially in colleges and institutions...the overall incidence appears to be increasing" (88).

The 1960 data, while still not completely accurate, due to the

earlier mentioned problem of diagnosis, is of value when applied to the statement, "... it is estimated that four or five collegians, per 1000, contact the ailment each year" (94, p. 30). Oregon State Univeristy health records for 1960 indicate an incidence of 17 per 600 for freshman students, five female and 12 male, or approximately 28 per 1000. It would appear that freshmen at Oregon State University are more susceptible to the disease than those on other campuses, or the data used to estimate the frequency of the disease for college students are in need of revision. This thesis would accept as a hypothesis the latter possibility as being the more plausible.

Hay Fever and Asthma

In medical literature hay fever is found to be associated with asthma. The two are not synonymous but both are allergies and information found to apply to one usually applies equally to the other.

Actually, hay fever is a misnamed disease. Hay does not cause the disease and a fever is not a characteristic of the ailment referred to. It is contended that "the single chemical agent that causes hay fever is found in ragweed pollen" (51, p. 264). Yet, there appears to be other factors working either to promote or worsen the diseases.

One author reports asthma not as a disease but as a symptom or group of symptoms, often brought on by environmental,

psychological and social factors (3). Broder, gives this definition:

> . . . "asthma" generally used in a broad context and applies to manifestations which are either brief or prolonged, a single episode or recurrent ones, and occurred either alone or in association with other upper or lower respiratory symptoms. . . "hay fever" applies to upper respiratory symptoms which were believed to be allergic in origin, occurring predominately in the spring, summer or fall (15, p. 515).

A key problem in utilizing the data is the lack of national norms, since the disease is not reportable (56). Estimates for its incidence range from four to eight million sufferers in the United States (37). On the basis of the data collected, it would appear that the incidence among freshmen at Oregon State University is much higher than that of the general population of the United States. If we were to use a mean of the estimated number of hay fever sufferers, six million, and establish a ratio for the population of the United States at the time of the estimate, 174 million we would have a rate of about 1:28 for the nation. Utilizing the data for 1950 we get an Oregon State University freshman ratio of 1:7. 7, or using the 1960 data, a ratio of better than 1:6.

Interpretation would suggest that (1) freshmen at Oregon State University are as a group more susceptible to hay fever and asthma than the population generally, (2) that the causal factors that make up the environment for Oregon State University freshmen are more likely to promote hay fever, or (3) that the national norms are either

not accurate or not reflective of the college freshman age group.

In any event, the number of cases of both hay fever and asthma shows a remarkable rise from 1930 to 1960 for Oregon State University male and female freshmen. Although there is no information to show why, the 1960 records indicate an extremely high incidence for both diseases among the male freshmen.

Pneumonia

The data relating to pneumonia and the Oregon State University freshmen indicate fluctuation but not enough change in numbers of cases to indicate trends. The numbers of cases for female and male freshmen in 1960 are very close to the 1930 number of cases. In fact, the 1960 case incidence is neither high nor low on the charts. The male freshmen lead the female freshmen in total cases per sample year throughout the study.

National norms are based on death rates and therefore of limited value. However, it is of interest to note that where pneumonia was at the top of the killer list at the beginning of the century it now rates a low sixth.

Although the data for Oregon State University freshmen and that of the lowering death rate do not seem consistent, a few facts might clear up the apparent inconsistency. When pneumonia kills, the causative factor is a toxin of the pneumococcus. With the discovery

of penicillin, and the resulting mass production in the 1940's, the pneumonia fatality rate has dropped from 40 percent to less than four percent (23; 74). Bacterial pneumonia, probably as prevalent as ever, simply isn't the killer it once was. The result is a dramatically lowered death rate but non-affected incidence rate. Then too, there is virus pneumonia, rarely fatal, but thought to be on the increase, since we can do little to stop the virus (23).

Thus it appears that the data for Oregon State University freshmen and the recognized incidence of pneumonia seem to be rather consistent.

Tuberculosis

The data reflected for tuberculosis by Oregon State University freshmen is enlightening but hardly surprising. For the 30 year period studied, six cases were found among both freshman females and freshman males. In the freshman class of 1960 records indicate a complete absence of the disease.

It would appear that there are a number of major factors that would account for the statistics. The age and socioeconomic range is not favorable; today's death rates are highest among those past 45, with both morbidity and mortality rates increasing with age. Also, rates are highest among low income groups especially unskilled workers, Negroes and single males over 60 years of age (73). It is

hardly a secret that Oregon State University freshmen, as a rule, do not fit into these categories. The advances in medical science have contributed x-rays, skin testing, surgery, drugs and case finding. Certainly the affluence of our society has been a deterrent to the "White Plague". Todd states, "Healthy children are less likely to contract the disease. Among the important factors affecting child health are diet, fresh air, housing conditions and social class, and these factors are of considerable importance in tuberculosis disorders" (89, p. 174). All of these factors have been significant in reducing both mortality and morbidity in the general public as well as among college students.

An additional discussion of the trends in tuberculosis is found in Chapter 5.

Tonsillitis

This disease offers an interesting study of the ebb and flow of medical thought in America. Tonsillitis has undergone a metamorphosis in interpretation which is typical of many diseases. It appears that doctors of 30 and 40 years ago often would look at inflamed throats and enlarged tonsils and pronounce, "tonsillitis". This was followed by the pronouncement that the tonsils should be removed.

It is true that many diseases often first appear in lymphatic tissues such as in the tonsils, and when the swollen tonsils became

painful the child was taken to the doctor. Often failing to recognize the basic pathogens that caused the inflammation, the doctor would see only the swollen, inflamed lymphatic membranes. Today, many of the diseases that might have caused tonsil infections are prevented through more accurate diagnosis and effective treatment.

Thus, it seems likely that both the continual pronouncements by the physicians of "tonsillitis" and the dramatic emphasis of the tonsillectomy firmly imbedded themselves in the minds of the freshmen students of 1930 when asked if they had had tonsillitis.

However, more recent medical practice has advocated the need to discover the cause of tonsillitis and treat the cause rather than the symptoms (2). In the past 20 years physicians have urged caution in the removal of the tonsils (67). Once considered the simplest and safest of operations, tonsillectomies in 1947 were called, "The most frequent surgical procedure in the United States" (67, p. 46).

Today many physicians recognize that swollen tonsils are doing the job they were intended to do and removal might not check the spread of the basic causal factor. Tonsillectomies are now regarded with less favor and most doctors are members of the leave-them-in school of thought (90).

At the college level a study of tonsillitis at the University of Wisconsin indicates that it accounts for approximately 25 percent of the admissions for respiratory to the university infirmary. The

report further states, "Acute tonsillitis and pharyngitis in the patient presenting with fever and sore throat is a common clinical syndrome" (34, p. 699).

An examination of the data for tonsillitis among Oregon State University freshmen shows a high number of cases reported for the freshmen entering in 1930, the males reporting 169 cases and the females reporting 186 cases. The reported cases of tonsillitis dropped in 1940, with the freshman males reporting 88 cases and the freshman females reporting 106 cases.

It would appear quite likely that the ten year period from 1930 to 1940 was one where the school of medical thought swung from the dramatic pronouncement of "tonsillitis" and "let's take 'em out", to the era of treatment and wait-and-see. While there were probably as many inflamed tonsils in the 1940 freshman group as in the 1930 group, inflamed tonsils were not given the same attention that earlier tonsil infections were given.

It would appear that by 1950 there was an increase in the total number of reported tonsillitis cases by both freshman females and males. The number again increased for the members of the Oregon State University freshman class of 1960. Since doctors were cautious in the removal of tonsils and possibly more selective in the use of many "miracle" drugs, cases that earlier may have been subject to removal, or possibly treatment with penicillin, were now allowed

to progress in the hope that the body could muster its own disease fighters, thereby saving the tonsils.

It is recognized that allergies may cause enlarged tonsils (67). Doctors would rather work on the allergy than remove the tonsils. In either case, the reported number of cases would appear to go up simply because the tonsils are allowed to remain in the body doing the job they are designed to do.

Typically females have a higher incidence of infectious respiratory diseases than males and this is reflected in the constantly higher number of tonsillitis cases among freshman females at Oregon State University. Why the women should seemingly suffer from more infections than the men is not disclosed in this study, nor is it referred to in any of the related literature. There may be a possibility of a correlation between the high incidence rate of rheumatic fever and that of tonsillitis for females. This would require more investigation.

Rheumatic Fever

A disease that is still more of a mystery than any other under consideration, rheumatic fever is referred to as a disease of which "the cause, pathogenesis, course, treatment and prognosis are unknown" (39, p. 380). In fact, the one thing the writers agree upon is that we do not know what causes the disease (96; 20; 92; 77). Even

those who point the accusing finger at the streptococcus admit the evidence is slim and circumstantial.

However, researchers do agree on several basic premises relating to the disease's incidence. First, to have been exposed to the hemolytic streptococcus is a prerequisite. Most cases came from circumstances that can be best described as a "lower standard of living", or those that are "lean and hungry" (92, p. 76; 96, p. 36). Certain geological conditions favoring colder weather, but not arctic, have a higher prevalence. There does seem to be a family sensitivity.

Perhaps the main problem in collecting data on strep throats is that of diagnosis. A study in Illinois indicated that statistical diagnosis is only 75 percent accurate, sometimes less (32).

With these factors in mind it can be seen that it is entirely possible that the indicated non-existent cases for 1930 and 1940 may simply be a case of poor original diagnosis. Another possibility behind the data for the early years is that rheumatic fever kills many of its victims before they reached college age. Of those who were still living, intensive care and sheltered lives may have prevented them from seeking a college education. Supporting this point Marienfeld states, "...Moreover, the rates observed among the highest socioeconomic group represented by college freshmen are understated to the extent that rheumatic heart disease can be

sufficiently disabling to preclude college admission" (62, p. 800).

The small but rising incidence rate of 1950 and 1960 would seem to be a result of the combination of better diagnosis (92), and the ability to control rheumatic fever fatalities through the use of modern antibiotics (8). Bland reports that "the mortality rate has diminished eightfold from 1931 to 1951" (11, p. 598). There is a definite trend toward more college freshmen at Oregon State University reporting rheumatic fever in their health histories. The difference in numbers of cases among females and males, even with the small total number of cases, shows that the freshman females are much more susceptible to rheumatic fever than the males. It is tragic that any rheumatic fever should exist since we now have the means for prevention of the disease.

Pertussis

The disease that shows the most spectacular drop in case incidence from 1930 to 1960 is whooping cough, more esoterically known as pertussis. A disease that once ravaged through Europe; Kaufman describes it as "...a significant and dangerous disease, causing more deaths in the first year of life than measles, scarlet fever, diphtheria and poliomeyelitis combined" (55, p. 417). Pertussis is now controlled primarily through drugs (12). Immunization is usually administered through the D. P. T. series (see Diphtheria,

page 18). Characterized as the "only childhood disease that kills more girls than boys" (9, p. 16), the data would support the higher incidence rate among the girls. In all of the years sampled the rate for the females is consistently higher than for the males.

The drop from 199 cases in 1930 to two cases in 1960 is a 99 percent reduction for the males. For the female freshmen the drop from 229 cases in 1930 to three cases in 1960 is a reduction of 98.8 percent, a vivid testimony to the effective use of biologics. Prediction of trends in pertussis, based on data collected, would suggest the possibility that it may disappear as a disease entity for Oregon State University freshmen.

Epilepsy

The data gathered are so scanty as to be of no value for statistical purposes. However, like mental disorders and mononucleosis, the lack of data may be indicative of factors other than the disease prevalence. The U. S. Public Health Service estimates that this nation has three-fourths of a million epileptics (60). If this is true it would seem likely that Oregon State University might have a slightly higher rate than one per 2400. The national rate is roughly one per 225 of the general population.

Actually there are several factors at work to keep the epileptic rate low among college students. Perhaps the major factor is

ignorance and superstition, preventing the epileptic from reaching a maximal academic potential. He has been an outcast for centuries and is still considered one by much of modern civilization. He lives in apprehension of a seizure. He is forbidden to marry or drive a car in several states (25). Is it any wonder epileptics are not found on college campuses?

It would seem that there is a possibility that we have some students who are epileptic but are not willing to admit it. The emotional scars that form their defenses are not easily broken down.

Additional Health Data

Not entirely related nor unrelated to this study is the number of individuals in each group who have been vaccinated against smallpox. It is interesting though not surprising that the proportion of incoming freshmen who have been vaccinated increases with each decade so that now virtually all freshmen at Oregon State University have been vaccinated against smallpox.

Table 7. Smallpox vaccination of a sampling of male and female freshmen entering Oregon State University

	1930	1940	1950	1960
Smallpox vaccinations - male	177	221	299	300
Smallpox vaccinations - female	180	242	299	300

Blood pressure is most meaningful when it applies to an individual yet, the range in blood pressures found in a group of people is of interest to investigators in the health field. The wide variations in Tables 8 and 9 indicated that hypertension and hypotension is manifest in all of the the incoming groups studied. The implication is clear that even among the finest of our youth cardiovascular abnormalities exist which the entrance medical examination brings to light. The important next question is, "What is done in the way of follow-up for those freshmen in the extreme categories of low or high blood pressures?" This is a field of investigation rarely entered but one which is in need of thorough study.

Table 8. Blood pressure of a sampling of female freshmen entering Oregon State University

Blood Pressure	Range	Mean	Standard Deviation
1940 systolic	91 - 140	110.23	9.50
diastolic	46 - 95	72.56	8.35
1950 systolic	81 - 170	114.89	10.39
diastolic	51 - 100	71.72	7.65
1960 systolic	81 - 150	112.60	10.39
diastolic	41 - 90	70.08	7.88
Pulse 1960	56 - 98	87.26	12.10

Table 9. Blood pressure of a sampling of male freshmen entering Oregon State University

Blood Pressure	Range	Mean	Standard Deviation
1940 systolic	81 - 171	115.67	13.97
diastolic	40 - 100	71.71	9.62
1950 systolic	81 - 160	120.66	10.54
diastolic	46 - 90	72.63	8.35
1960 systolic	71 - 160	120.08	10.26
diastolic	51 - 95	72.43	8.37
Pulse 1960	56 - 98	85.58	13.50

Summary

Of the diseases included in this study there has been a definite reduction in the number of reported cases of diphtheria, smallpox, tonsillitis and pertussis among Oregon State University male and female freshmen. The diseases that show little or no change are pneumonia, tuberculosis and epilepsy. Diseases that show an increase in the number of reported cases are mononucleosis, hay fever, asthma and rheumatic fever.

Both diphtheria and pertussis appear to be disappearing as diseases that might have affected Oregon State University freshmen. Tonsillitis is the disease most reported by the 1960 freshman class, with significantly more freshman females reporting tonsillitis than freshman males.

Some of the disease trends seem to reflect improved medical

diagnosis, the use of immunization, and treatment with modern drugs. In analyzing trends it is of value to keep in mind the possibility of faulty reporting on the part of the freshman student.

CHAPTER V

PARENT AGE AND HEALTH RECORD

Included in the study of the health of the Oregon State University freshman student was a tabulation of the responses listed for parents and relatives. At the beginning it was undecided as to the ultimate value of this information. However, as the data were accumulated it became apparent that these data would help to know the students and their backgrounds better.

Much of the information and interpretations found in the responses may seem less physiological and more socio-economic, but it is accepted that health status is closely aligned with social, cultural and economic factors. Any examination of the health of a group of people, neighborhood, community or nation, would ultimately have to come to grips with the total environment.

This is not to imply that this study does examine all of the socio-economic-cultural relevancies of the students. Rather, these data would contribute to an overall larger socio-economic study, if one were to be made.

The Appendix Tables 11 - 18 were, for convenient grouping, broken down into age-range groups of two-year categories. Thus the low range for the ages of mothers of women entering college in 1930

was in the 34 to 35 year group, listed as 34; the high group was 60 to 61, listed as 61. The parent age range then becomes one that will bracket the ages listed on the student's health cards.

Ages of Mothers of Freshmen

Examination of the data shows that the age-range for the mothers of entering female freshmen at Oregon State University from 1930 to 1960 does not change significantly, suggesting that the age range is constant and without much change.

Table 10. Ages of mothers of a sampling of female freshmen entering Oregon State University

Year	Range	Mean	Standard Deviation
1930	34 - 61	46.55	6.19
1940	32 - 63	45.58	6.00
1950	34 - 65	45.73	5.64
1960	34 - 59	45.50	5.10

An examination of the age of mothers of male freshmen at Oregon State University shows a definite trend in the age range, with some fluctuation, toward a lower range of ages from 34 in 1930 to 30 in 1960. The higher age range does fluctuate from 67 in 1930 to 71 in 1940 and 1950 then returns to 67 in 1960 indicating no significant change for the 30 year period under study.

Table 11. Ages of mothers of a sampling of male freshmen entering Oregon State University

Year	Range	Mean	Standard Deviation
1930	34 - 67	46.58	5.92
1940	30 - 71	46.23	6.52
1950	32 - 71 (80+)	45.95	6.37
1960	30 - 67	43.90	8.84

The trend toward younger mothers for freshman students is clearly demonstrated by the mean ages of both the female's and the male's mothers. Data on the 1930 freshman female's mothers indicate a mean age of 46.55 years with a constantly lowering age trend toward the low mean of 45.50 years in 1960. An exception, a slight increase in the mean age of mothers of female freshmen at Oregon State University in 1950, is reflected also in the mean age of fathers of female freshmen for the same year (see Table 12). There is a lowering of the mean ages from 1930 to 1960 of 1.05 years for the mothers of freshman female students.

The mean age for the mothers of male freshmen at Oregon State University clearly indicate a drop or trend toward younger mothers, greater than that of the mothers of female freshmen. A definite decrease from 46.58 years to 43.90 years for mothers of male freshmen is reflected in their mean ages from 1930 to 1960.

A decrease in mean age is fairly constant from 1930 to 1940 and 1950, but drops sharply in the next ten year period. From 1930 to 1960 a lower mean age for mothers of male freshmen is 2.68 years. Mean ages for mothers in the 1930 female and male freshman group are almost identical. The principal difference seems to be in the final mean age for 1960.

It becomes obvious that while the data indicate that the mean ages of both groups of mothers was comparable for 1930, the 30 year interim resulted in younger mothers for males entering Oregon State University. That there has been a tendency for mothers to have children at an earlier age is borne out in official birth records. Yet, why the mothers of male students have a greater decline in age than the mothers of female students is not evident.

Tables 11 and 12 have a mark (80+) which indicates that a parent sampled had an age over 80 years.

Ages of Fathers of Freshmen

Examination of the age-range of fathers of female freshmen at Oregon State University indicates a slight lowering trend for the younger fathers and a definite lowering trend for the older fathers. The bracket ages for the fathers of male students indicate a general lowering in the younger range with less change in the upper age range. The age-range of fathers of 1960 entering males indicates an

upper high of 79 years, greater than that of any previous year for fathers of male freshmen.

Table 12. Ages of fathers of a sampling of female freshmen entering Oregon State University

Year	Range	Mean	Standard Deviation
1930	34 - 79	50.74	7.76
1940	34 - 75	49.72	6.59
1950	32 - 69 (80+)	49.76	7.03
1960	32 - 71	48.32	6.57

Table 13. Ages of fathers of a sampling of male freshmen entering Oregon State University

Year	Range	Mean	Standard Deviation
1930	38 - 75	51.46	6.85
1940	36 - 71	50.64	6.90
1950	36 - 75	49.46	6.49
1960	34 - 79	48.33	7.18

A comparison of the age-range of the fathers of entering females and the age-range of the fathers of male freshmen indicates that the Oregon State University freshman females tend to have fathers with a younger age range than their male counterparts. However, age range is only an index and of less significance than the

mean age.

The mean age for fathers of female freshmen indicates a general lowering from 1930 to 1960 of 2.42 years. Again the year 1950 proves to be an exception as it was in the previous study of the mean ages of mothers of female freshmen. The fathers of male freshmen show the greatest decrease in age of the groups studied. Beginning with a mean age of 51.46 years in 1930, there has been a decided lowering of the mean ages in each year studied to a low mean age of 48.33 years for 1960, an overall decrease of 3.13 years.

Information found in the study does not give ample reason for the general lowering of parent ages, but it would appear evident that the parents of college age students during the depression (1930 groups) might have had to wait a while longer before being able financially to support children in college. The prosperity of the 1960's allowed parents to send their children off to college without the delays caused by uncertain financing. Also, the students who are chiefly self supporting might have to delay their college entrance a couple of years during times of less employment. Any delays caused either by the student's financial inability to meet the costs of higher education would ultimately cause the parents to be older at the time of the student's admission.

Parental Health Status

Tables of parental health status and diseases of relatives have been included in the study because of the need to establish relationships and correlations with studies done on the population increase and decline in mortality, along with certain morbidity studies. Although the tables do not deal specifically with the health status of Oregon State University freshmen, the implications for his future are found in the data. Also, it is a rare opportunity to gather data that may contribute to the general fund of knowledge about our health.

Table 14. Causes of death of parents of a sampling of female freshmen entering Oregon State University

Year	Alive	Numbers of dead by cause			
		Organic	Infection	Violent	Unknown
Father					
1930	266	14	9	7	4
1940	283	11	5	1	0
1950	281	12	2	5	0
1960	289	5	1	5	0
Mother					
1930	283	8	8	1	0
1940	288	4	6	2	0
1950	293	7	0	0	0
1960	296	2	2	0	0

Table 15. Causes of death of parents of a sampling of male freshmen entering Oregon State University

Year	Alive	Numbers of dead by cause			
		Organic	Infection	Violent	Unknown
Father					
1930	271	8	16	3	2
1940	281	7	2	7	3
1950	285	10	3	2	0
1960	280	12	0	8	0
Mother					
1930	281	7	6	1	5
1940	285	5	6	3	1
1950	288	8	3	1	0
1960	293	7	0	0	0

These tables give a clear indication of the increase in numbers of live parents for the freshmen at Oregon State University. Although the numbers do not agree for both males and females, it can be established that in 1960 fewer parents had died by the time their sons or daughters have become freshmen than was the case 30 years previous.

Tables for the mothers of both male and female freshmen show general agreement on total numbers. The data for the "alive" category for the fathers of male and female freshmen are not as consistent

as data for the mothers. A particular year, 1960, seems to have data characteristics that do not fit the general pattern. It shows the fathers of male freshmen to have deaths that are the highest since 1930.

Although different investigators may place different interpretations on the causes of the variations found in the data, one thing seems certain, that the mother's death numbers, in general, are smaller than the death numbers of the fathers in both Tables 14 and 15.

In considering the causes of death, the tables are, perhaps, of less validity for statistical purposes, than of general interest for comparisons. Here, interpretations of the remarks indicated on the health cards were at wide variance. It became apparent that many given causes of death were only generalities, i. e. "He died of incompetence" or of "old age." These and many other statements, difficult to categorize, account for a large number of deaths.

There are definite contradictions in terms of trends. For example, the "organic" listing shows a general decrease for both mothers and fathers of female freshmen over the 30 year period studied. While the fathers of male freshmen show a general increase in deaths due to organic causes, no change is indicated for mothers of male freshmen.

The only list that seems to fit the general area of knowledge

and statistics available from other sources is the decrease in numbers of deaths due to "infections" in all parent categories. This fact is readily understandable if one reviews the widespread use of sulfonamids, penicillin, and other antibiotics for the infections of man. For this reason the tables are offered without comment or interpretation, and with some question of their validity. Yet, these data may be of informational value where no such data exists at present. They might also be of use for comparison with other more controlled studies of the same subject.

An analysis of the diseases of relatives of Oregon State University freshmen provides most enlightening data. Although we do not have the numbers of relatives under consideration so that rates may be determined, the reported incidence provides clues as to trends.

Table 16. Diseases of relatives of a sampling of female freshmen entering Oregon State University

	Number of cases by cause				
Year	Heart	Diabetes	Cancer	Tuberculosis	Mental
1930	53	19	49	30	0
1940	55	32	59	37	0
1950	57	41	68	38	4
1960	64	47	93	20	2

Table 17. Diseases of relatives of a sampling of male freshmen entering Oregon State University

Year	Number of cases by cause				
	Heart	Diabetes	Cancer	Tuberculosis	Mental
1930	46	18	42	20	0
1940	38	29	41	23	0
1950	41	28	53	28	4
1960	72	44	63	15	6

Heart Disease

The data collected indicate a definite increase in the number of relatives suffering from heart disease. The increase is shown in Tables 16 and 17 although the changes are not uniform on both sets of tables. Relatives of female freshmen show a small but consistent gain in heart disease from 1930 through 1950 with the greatest gain coming in the decade from 1950 to 1960.

However, the same gain is not indicated by the relatives of freshmah males. In fact, the numbers decrease from 1930 with a reported 46 relatives to 38 reported in 1940. The gain to 1950 is small at 41, still not approaching the total for 1930. In the ten year period from 1950 to 1960 a most significant gain is indicated with the total number of cases reported at 72, actually surpassing the 64 indicated by the relatives of freshman females.

It is possible that the period from 1930 to 1950 with its low

increases, or in the case of the male's relatives a lowering of heart disease, may reflect the state of the social-economic period. It is contended by some writers that a cause and effect relationship between high fat diets and heart disease does not exist, nevertheless, much evidence is available which indicates a correlation (13; 31; 36; 35). That these were years of depression or war, with a scarcity of high fat foods, such as butter, dairy products and pastries, may offer some explanation for the small increase in the number of heart disease cases. Accompanying the large increase from 1950 to 1960 was prosperity and an abundance of the foods which were scarce during the prior generation.

Other factors were undoubtedly at work to bring about the increase reported in heart disease. Some of these factors are improved diagnosis accompanied by more accurate reporting in 1949 (91), increases in blood pressure (43), demonstrated by data in an earler chapter of this thesis, accompanied by the greater incidence of hypertension of today's population (31). Obesity, mentioned by many writers and suggested in this thesis cannot be ruled out as a possible factor (31; 68).

The strongest possibility to suggest a logical increase in the diseases of heart, diabetes, and cancer is the one of inherited predisposition. As life expectancy is increased in the United States as a result of a lower infant mortality rate, coupled with a decrease in

killing childhood diseases, there results a longer sexual productivity. Quantitatively speaking, man thus will be able to breed and leave more offspring with his particular qualities and defects. In previous generations, the weak did not survive as long, often not to reproductive ages, or beyond. Today the same person has years of life added through the miracles of medicine.

Campbell, discussing the higher incidence of heart disease states:

> I consider that the increasing age of the population caused by the lives saved because of the better control of infectious diseases is the main, if not the only, reason for a large increase in the deaths from all heart disease since 1924. (16, p. 2)

It is possible that the data suggests man will continue to increase in the diseases that are normally considered organic and degenerative, at least as long as life expectancy is continuously being increased.

Diabetes Mellitus

Of the diseases of relatives, diabetes data suggest the most rapid rise of any disease studied, being over a 100 percent rise in both the male and female tables. With the exception of the year 1950, for the relatives of male freshmen, a steady increase in diabetes is shown. There also seem to be spurts in the data. The data for the year 1940 indicate a strong increase over 1930, as does the

data for 1960 over 1950. Again, the possibility of increased life expectancy contributing its resultant hereditary factors seem to be the best answer as to why there is an increase in numbers. This possibility is supported by other researchers (83; 78; 24; 80). The obesity factor, prevalent in many cases of diabetes should be considered (68; 78; 24). Indeed, the British Medical Journal suggests, "In middle life, as it has been suspected for a long time, it is gluttony more than genes which cause us to degenerate" (46, p. 941).

The data observed for diabetes are reflected in nationwide statistics and reflect the importance of medical discovery (24). When Dr. Fredrick Banting discovered insulin in 1922 he made it possible for millions of people to live a life of nearly normal expectancy. Whatever the quirk of metabolism that causes this disease, it is found in more people today than at any time in man's recorded history.

Cancer

In this disease some discrepancy is found in the data of the female's relatives as compared with those of the freshman male's relatives. While the freshman female's relatives indicate a steady, almost predictable increase during the years 1930 to 1950 with a huge increase in 1960, the freshman male's relatives actually experienced a decrease from the year 1930 to 1940. Using the data from the

relatives of male students with the base year, 1930, we find a steady increase of about ten additional cases in the ten year periods following.

The information on cancer incidence found in the study confirms the data of other studies, inasmuch as it shows a decided increase in the number of cases of cancer in the general population (17; 48; 86). Without further data, such as types of cancer, deaths, sex of relatives and other information, it would be difficult to draw conclusions on the significance of the data.

However, because this study deals with familiar medical histories it might be worth considering the prior mentioned implications of heredity. Although some literature suggests that cancer is non-hereditary (79), others do not agree (47). Still the factors behind selection, survival, and adaptation that govern man's progeny seem to be present here. If there is a tendency or hereditary predisposition, even for certain types of cancer, then the data gathered would strengthen this argument.

Another factor that certainly cannot be overlooked in attempting to analyze the increase in cancer in relatives of Oregon State University freshmen must be the one of increased longevity. Cancer is characteristic of middle and old age (17; 40; 48; 86). E. Cuyler Hammond, well known cancer researcher, states, "Cancer is mainly a disease of the second half of life..." (18, p. 84).

Tuberculosis

Of the diseases reported in the study of relatives of Oregon State University freshmen the only one to show a definite and overall drop in total reported cases is tuberculosis. Although the numbers reported by freshman males and females do not quantitatively agree, they are both very similar in many respects.

Beginning in 1930 with a reported low number of cases the relatives for both sexes show an increase for 1940. The numbers of cases continue to climb to a high in 1950. Then, in 1960 there is a decided and significant decrease in the total cases.

Again, the data in this study agrees with much of that from other sources (7; 73; 82). Yet without rates it is difficult to state categorically that there are correlations of a positive nature.

An attempt to explain the sudden drop in cases in 1960, as opposed to the previous sampled years, brings about an awareness of a multitude of factors that could be considered contributory. Some that are apparent are the use of mass x-rays for early detection, reaching a high in 1950 (7); the development of such drugs as Streptomycin (1944), para-aminosalicylic acid (1948) and Isonaizid (1952) (82). These drugs proved effective against tuberculosis during the 1950's.

An ever-present factor in the history of diseases is the

socio-economic conditions of the years under study. The years between 1950 and 1960 were years of abundance in America. As over crowding, poor nutrition, inadequate sanitation and a host of adverse environmental conditions were improved, there was a reduction in the number of cases of tuberculosis (73; 82).

Mental Disease

On the whole the data representing the number of cases of mental disease among relatives of freshmen in this study does not look impressive. Certainly the validity of the data must be questioned. The number of cases reported is the smallest for any condition included in this chapter. These data are too inadequate to be meaningful. Yet, the number of reported cases tells us something about the disease and those who responded, or failed to do so.

Three decades ago, mental disease was little understood, surrounded by superstition and spoken of only in whispers. Diagnosis was poor or non-existent, and was mentioned only behind closed doors. Any one suffering from mental disease was shunted aside and generally not mentioned again. Mental disease was held to be a disgrace upon the family and not to be discussed in polite society.

Undoubtedly there were many cases of mental disease, even among the relatives of Oregon State University freshmen, in the years 1930 and 1940. That these were not reported is explained by

the stigma attached to the disorder. However, a change came over medical science and the general public during the late 1940's and 1950's. Mental diseases were no longer considered a disgrace but an undeniable fact of life. Diagnosis became better, cure possible, and even prevention likely. As people became aware of the nature and magnitude of mental disease they became less reticent to discuss or acknowledge it in their families. It would seem that the data do not necessarily reflect an increasing number of cases but rather improved diagnosis and an increasing willingness of the public to admit to the disease where it did exist.

Therefore, it must be assumed that the number of cases shown for the years 1930 to 1960 does not represent the true incidence, only the numbers that the freshmen and their families would admit to. It seems highly likely that future replies to the question would indicate increased incidence, yet it is possible that this would only be an indication of increased willingness to admit and recognize the problem as it exists.

Summary

In general there has been a lowering of the ages of the parents of both female and male Oregon State University freshmen. This is indicated in the somewhat lower age ranges and the more significant lower mean ages in recent years. Fathers showed a greater decrease

in mean age in recent years than did the mothers. This is true for the parents of both female and male freshmen.

Specifically, the 1960 female freshman's mother indicates a mean age of 45. 50 years, 1. 05 years younger than the 1930 freshman female's mother. The 1960 freshman female's father statistically shows a mean age of 48. 32 years as compared to the mean age of 50. 74 years, or 2. 42 years younger.

The 1960 freshman male's mother had a mean age of 43. 90 years, while the 1930 freshman male's mother had a mean age of 46. 58 years, indicating a difference of 2. 68 years. The freshman male's father showed the greatest drop in age from 51. 46 years in 1930 to a mean age of 48. 33 years in 1960, a decline of 3. 13 years.

While the freshman male's mother had a mean age of 1. 60 years less than the freshman female's mother for 1960, the mean ages for the fathers of both female and male freshmen are almost identical for that year.

Not only do the data show an overall decrease in age for the parents but a tendency for the age differences between the mothers and fathers to be less. Although the mother's mean ages are under that of the father's, the difference is not as great as it was 30 years ago.

The data indicate that both mother and father mortality for Oregon State University freshmen decreased from 1930 to 1960.

These data also indicate that the parents of the freshman female have a better statistical chance of being alive, for any given year, than those of the male. Further, the mothers of the freshmen have a better chance of being alive than the fathers; of the combined 600 population in 1960, 589 mothers were living compared to 569 fathers.

Causes of parental death were considered statistically invalid due to wide variation in reporting and evaluation. Of those listed where consistency was reliable the number of deaths from infection has been shown to become less in the succeeding sample years of the study.

Diseases of relatives of Oregon State University freshmen conformed to the trends established by other researchers. Heart disease, cancer and diabetes showed extremely strong increases numerically, while tuberculosis cases increased slightly from 1930 to 1950 and then dropped off sharply. The data for mental disease was considered to be of less significance in determining numbers of trends.

Perhaps the most important factor found in this section of the study was the great increase in diabetes. The percentage of increase was far greater than either that of either heart disease or cancer.

Since the specific causal factors of all the diseases examined are still unknown, several related factors were examined in light of their correlation to the increases. Of these, longer life expectancy, heredity, obesity and medical discoveries seemed to contribute to the general increase in morbidity.

CHAPTER VI

SUMMARY, CONCLUSIONS, SUGGESTIONS TO IMPROVE FURTHER INVESTIGATIONS

Basic to the hypothesis of this thesis was the assumed change in the health status of Americans since the beginning of the Twentieth Century. As the environmental, socio-economic and education patterns have been supplemented by advances in medical science, it is thought that the general population must be healthier and less disease ridden than previous generations.

Due to convenience in data gathering it was decided to use as a sample population the freshman classes at Oregon State University. This was done because prior to enrollment each freshman had to submit to a physician's examination. Further, the health cards had records of the health histories of the students. The Oregon State University Health Service staff agreed to allow investigation of their record files from 1930 to 1960. An analysis of the health record cards used over the past 31 years showed certain consistencies allowing ample comparable data to be gathered.

It was decided that a random sample of 600 freshman health record cards per year would give reliable data for study purposes. Inasmuch as the 30 year period from 1930 to 1960 was chosen, using the sample years of 1930, 1940, 1950, and 1960, a total of 2400

Oregon State University freshman health cards were analyzed. For statistical purposes the information on female and male freshmen was computed separately.

Included in the study was certain basic information pertaining to the health status of the student's parents and relatives. The information was readily available on the health record cards and of value to the total study of possible changing health patterns.

Following the advice and directions of the Oregon State University Department of Statistics, the cards were selected, transcribed to key punch cards and computed. Final statistical evaluation was made of the range, the mean and the standard deviation of the information obtained. This gave a composite or average image of the male and female student for each year studied. In this way a comparison of the changes from each decade is easily made and easily charted.

Study of the parent's ages revealed a general lowering of the ages for parents of both freshman females and males. The fathers of the freshman females had a mean age of 50. 74 years in 1930, and a mean age of 48. 32 years in 1960, or a lowering of the mean age of 2. 42 years for the 30 year period. Fathers of freshman males had a mean age of 51. 46 years in 1930, progressively lowering to a mean age of 48. 33 years in 1960, a drop of 3. 13 years. The mothers of freshman females had an indicated mean age of 46. 55 years in 1930,

opposed to a mean age of 45.50 years in 1960, or a mean age decrease of 1.05 years. The mothers of male freshmen showed a decline of 2.69 years for the mean age, with their mother's mean ages being 46.58 years in 1930, and 43.90 years in 1960.

The data further indicated that as well as being younger the parents of the 1960 Oregon State University freshmen also had a better statistical chance of being alive than those in 1930. Living mothers of enrolling freshmen in 1960 outnumbered the living fathers.

Although data on the causes of parental deaths were considered invalid, there is evidence to indicate fewer parents are dying of infectious diseases than had been the case 30 years earlier.

Heart disease, cancer, and diabetes were shown to be a greater threat to relatives of Oregon State University freshmen in 1960 than they were in 1930. Tuberculosis is reported far less frequently in 1960 than it was in 1930. The disease with the greatest increase was diabetes. Relatives of freshmen at Oregon State University have experienced a gain of over 100 per cent in the reported cases of diabetes. The data for mental disease were considered to be too unreliable for statistical evaluation.

In reaching conclusions about the increases or decreases of the diseases of relatives of freshmen it was felt that several factors might have influenced disease prevalence. Chief among these factors were longer life expectancy, heredity, obesity, and medical discoveries.

Both freshman females and males at Oregon State University have shown growth increases in the past 30 years. In 1960 the mean height for the freshman females was 64. 04 inches, and 70. 05 inches for freshman males. The data indicates an average gain of . 44 inches for the freshman females and 1. 40 inches for the males.

However, the 1960 class was not the tallest in the study. The class of 1950 had a mean height of 64. 85 inches for the females, and 70. 42 inches for the males. The reasons for the greater mean heights in 1950 over 1960 are not readily apparent. The hypothesis held by the investigator is that the 1960 heights represented a tapering off of growth following the concentration on nutrition in the 1930's and 1940's.

Both female and male freshmen showed a consistent weight gain from 1930 to 1960. The females gained an average of 7. 37 pounds, for a mean weight of 129. 07 pounds in 1960. The males had a mean weight of 161. 32 pounds in 1960, or a gain of 16. 04 pounds over the class of 1930. Placed in a ratio, the females gained an average of 16. 07 pounds per inch increase in height, while the males show an increase of 11. 45 pounds per inch increase in height.

Not only do the data indicate the freshman class of 1950 is taller, and that of 1960 heavier than those of preceding years, but the freshman class of 1940, both females and males, are taller than those of comparative studies of non-students.

The health history cards of Oregon State University freshmen indicate the diseases of diphtheria, smallpox, tonsillitis and pertussis decreased from 1930 to 1960. Of these, both diphtheria and pertussis are the most likely to disappear as health threats.

Pneumonia, tuberculosis and epilepsy, each with its own incidence rate, seem to have changed very little over the 30 year period studied.

Diseases that are on the increase are mononucleosis, hay fever, asthma, and rheumatic fever. These diseases are apparently not related, with the exception of hay fever and asthma, and the factors behind their increases are distinct from each other.

Certain data, such as smallpox vaccinations and blood pressure are included for their statistical value and without attempt at analysis.

On the basis of the data gathered it is now possible to conceive a composite picture of the health status of an Oregon State University freshman for any of the four decades sampled. We can assign to him, or her, certain general characteristics based on the statistical norms for his class. Although it is possible that no one student would fit the picture perfectly, we know, because of statistical procedures, that 68 percent will be within one standard deviation of the mean.

The average freshman female at Oregon State University in 1930 was 63.60 inches tall and weighed 121.70 pounds. Her parents were both alive; her mother's age was 46.55 years, and her father's

age was 50. 74 years. The chances are about even that she had at one time had tonsillitis, and two-out-of-three she had had pertussis. She was vaccinated for smallpox. Her relatives had a one-in-six chance of having heart disease, one-in-fifteen of diabetes, and one-in-six of cancer, and one-in-ten of tuberculosis.

The average freshman male at Oregon State University in 1930 was 68. 65 inches tall and weighed 145. 28 pounds. Both of his parents were alive; his mother's age was 46. 58 years, and his father's age was 51. 46 years. Chances are better than even that he had had tonsillitis and two-out-of-three that he had had pertussis. He had probably been vaccinated for smallpox. His relatives' chances of having heart disease were one-in-seven, diabetes one-in-fifteen, cancer one-in-seven, and tuberculosis are one-in-fifteen.

The average female freshman at Oregon State University in 1940 was 64. 09 inches tall and weighed 125. 94 pounds. Her parents were both alive; her mother's age was 45. 58 years, and her father's age was 50. 74 years. If she had two room mates, one of them would have had tonsillitis and two of the girls would have had pertussis. She would have been vaccinated for smallpox. Her blood pressure would be 110. 23 mm. Hg. systolic, and 72. 56 mm. Hg. diastolic. Her relatives would have a one-in-six chance of having heart disease, one-in-ten of diabetes, one-in-five of cancer, and one-in-eight of tuberculosis.

The average male freshman at Oregon State University in 1940 was 68.98 inches tall and weighed 153.22 pounds. His parents were both alive; his mother's age was 46.23 years, and his father's age was 50.64 years. He probably missed having tonsillitis, but one of his three room mates did have it. His chances of having had pertussis are still better than even. He was vaccinated for smallpox. His blood pressure is 115.67 mm. Hg. systolic, and 71.71 mm. Hg. diastolic. His relatives' chances of having heart disease are one-in-seven, diabetes are one-in-ten, cancer are one-in-seven, and tuberculosis one-in-twelve.

The average female freshman at Oregon State University in 1950 was 64.85 inches tall and weighed 128.25 pounds. Her parents were both alive; her mother's age was 45.73 years, and her father's age was 49.76 years. One of her two room mates would have had tonsillitis and she and one of the other girls would have had pertussis. She would be vaccinated for smallpox. Her blood pressure would be 114.89 mm. Hg. systolic, and 71.72 mm. Hg. diastolic. Her relatives would have a one-in-five chance of having heart disease, one-in-seven of diabetes, one-in-four of cancer, and one-in-seven of tuberculosis.

The average freshman male at Oregon State University in 1950 was 70.42 inches tall and weighed 161.29 pounds. His parents were both alive; his mother's age was 45.95 years, and his father's age

was 49. 46 years. Of his two room mates one of them would have had tonsillitis and his chances of having pertussis are about even. He would have been vaccinated for smallpox. His blood pressure would be 120. 66 mm. Hg. systolic, and 72. 63 mm. Hg. diastolic. His relatives would have had one-in-seven chances of having heart disease, one-in-ten of diabetes, one-in-six of cancer, and one-in-ten of tuberculosis.

The average female freshman at Oregon State University in 1960 was 64. 04 inches tall and weighed 129. 07 pounds. Her parents would both be living; her mother's age would be 45. 50 years, and her father's age would be 48. 32 years. Chances are about even that she would have had tonsillitis, and less than one-in-ten that she would have had a potentially fatal disease, pneumonia. She would have been vaccinated for smallpox. Her blood pressure is 112. 60 mm. Hg. systolic, and 70. 08 mm. Hg. diastolic. Her relatives stand a one-in-five chance of having heart disease, one-in-six of diabetes, almost one-in-three of cancer, and one-in-fifteen of tuberculosis.

The average male freshman at Oregon State University in 1960 was 70. 05 inches tall and weighed 161. 32 pounds. Both of his parents were living; his mother's age was 43. 90 years, and his father's age was 47. 33 years. He, or one of his two room mates would have had tonsillitis. His chances of having had a potentially fatal disease, pneumonia, are about one-in-seven. He probably was vaccinated for

smallpox. His blood pressure would be 120. 08 mm. Hg. systolic, and 72. 43 mm. Hg. diastolic. His relatives have a one-in-four chance of having heart disease, one-in-seven of diabetes, and one-in-five of cancer, and one-in-twenty of tuberculosis.

On the basis of the information gained about the 1960 freshman class at Oregon State University it is possible to conclude that they have younger parents, and are taller and heavier than their predecessors. They have not had many of the more deadly diseases, especially the communicable ones, but do show somewhat of an increase in the diseases that cause temporary loss of capacity or vitality. If they follow the disease patterns of their relatives they will have a better than 50-50 chance of contracting either heart disease, cancer, diabetes, or tuberculosis.

In evaluating their health status, it would appear that they are indeed healthier than any of the earlier groups studied, or any of the generations referred to in studies of related literature. Yet, one must bear in mind the concept that health is somewhat relative in nature, and certain questions must be answered before we might give final judgment as to the true health status of freshman students at Oregon State University. (1) Are the students really more physiologically sound and capable of adjusting to, or adapting to, environmental hazards, or are we shoring up their stamina and resistance with immunizations, insulin, drugs and x-rays? (2) If they are

taller and heavier, is this sinew, muscle and bone, or is it obesity? (3) Aren't there other criteria, tests or evaluative devices that might be better used by health services to gain significant health information, other than those used in this study?

The answers to the above questions, as indeed the answer to "Are present freshmen healthier than those of classes past?", will be found in additional research. Much more data is required and more comparative analyses are needed.

We know something about the health status of Oregon State University freshmen, if we compare one class against another, but what do we know about the freshman's health compared to that at another college or university? How does he measure up to national norms? Where are the national norms? Is he as healthy as those of the same age who do not go to college?

The questions raised by the knowledge acquired through this study seem to over-shadow the information gained. Yet, it is hoped that this study may be the beginning of an effort to fill in the gaps of knowledge that exist in the area of health status.

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APPENDIX

Appendix Table 1. Height of a sample of freshman women entering Oregon State University in 1930, 1940, 1950, 1960.

Category (inches)	1930	1940	1950	1960
1 - 45	0	0	0	0
46 - 50	0	1	0	2
51 - 55	0	0	2	3
56 - 60	21	21	7	52
61 - 65	220	194	170	142
66 - 70	56	78	114	92
71 - 75	0	2	3	7
76 - 80	0	0	2	1
81 or above	0	0	0	0
Mean	63.60	64.09	64.85	64.04
Standard Deviation	2.21	2.54	2.72	3.68

Appendix Table 2. Height of a sample of freshman men entering Oregon State University in 1930, 1940, 1950, 1960.

Category (inches)	1930	1940	1950	1960
1 - 45	0	0	0	0
46 - 50	0	0	0	0
51 - 55	0	0	0	0
56 - 60	0	0	2	3
61 - 65	25	19	8	11
66 - 70	206	207	138	144
71 - 75	66	73	143	137
76 - 80	2	1	7	4
81 or above	0	0	1	1
Mean	68.65	68.98	70.42	70.05
Standard Deviation	2.51	2.39	2.78	3.24

Appendix Table 3. Frequency distribution of weights of a sample of freshman women and men entering Oregon State University in 1930 and 1940.

Weight in pounds	1930		1940	
	Freshman women	Freshman men	Freshman women	Freshman men
1 - 80	0	2	0	0
81 - 85	2	0	0	0
86 - 90	2	0	2	0
91 - 95	4	0	6	0
96 - 100	6	0	9	1
101 - 105	13	0	8	0
106 - 110	46	2	24	0
111 - 115	37	3	37	0
116 - 120	40	7	37	3
121 - 125	52	16	36	6
126 - 130	33	15	32	18
131 - 135	13	35	37	28
136 - 140	15	41	15	30
141 - 145	9	42	18	39
146 - 150	12	33	7	28
151 - 155	1	29	10	37
156 - 160	4	22	5	22
161 - 165	2	19	7	22
166 - 170	4	8	1	11
171 - 175	0	6	0	12
176 - 180	1	6	2	9
181 - 185	0	6	0	11
186 - 190	0	2	2	5
191 - 195	0	1	0	3
196 - 200	1	3	0	5
201 - 205	0	1	0	5
206 - 210	0	0	1	4
211 - 215	0	0	0	0
216 - 220	0	0	0	0
221 - 225	0	0	0	0
226 - 230	0	0	0	1
230 or above	0	0	0	0
Mean	121.70	145.28	125.94	153.22
Standard Deviation	15.92	20.05	17.81	20.34

Appendix Table 4. Frequency distribution of weights of a sample of freshman women and men entering Oregon State University in 1950 and 1960.

Weight in pounds	1950		1960	
	Freshman women	Freshman men	Freshman women	Freshman men
1 - 80	0	0	0	0
81 - 85	0	0	0	0
86 - 90	0	0	0	0
91 - 95	2	0	1	0
96 - 100	6	0	5	0
101 - 105	8	0	22	0
106 - 110	18	0	19	1
111 - 115	28	2	26	0
116 - 120	47	1	34	2
121 - 125	46	5	33	5
126 - 130	37	6	33	8
131 - 135	23	15	29	18
136 - 140	26	18	25	18
141 - 145	20	15	22	26
146 - 150	12	31	14	29
151 - 155	7	30	7	30
156 - 160	5	39	10	26
161 - 165	2	33	5	20
166 - 170	3	27	4	35
171 - 175	1	15	2	13
176 - 180	1	10	2	16
181 - 185	1	13	0	15
186 - 190	0	14	2	9
191 - 195	0	6	1	6
196 - 200	1	10	0	4
201 - 205	0	3	1	5
206 - 210	1	1	0	4
211 - 215	1	1	0	2
216 - 220	1	2	0	3
221 - 225	0	1	0	1
226 - 230	0	0	0	1
231 - 235	0	0	0	0
236 - 240	0	1	0	0
241 - 245	0	0	0	1
245 or above	0	0	0	1
Mean	128.25	161.29	129.07	161.32
Standard Deviation	17.75	20.28	18.66	32.03

Appendix Table 5. Diseases reported as having been experienced by a sampling of freshman women who entered Oregon State College in 1930, 1940, 1950, 1960.

Item	1930			1940			1950			1960		
	unknown	yes	no	unknown	yes	no	unknown	yes	no	unknown	yes	no
Diphtheria	0	12	288	1	10	289	1	1	298	2	1	297
Smallpox	0	31	269	1	25	274	1	2	297	2	6	292
Mononucleosis	0	0	300	1	0	299	1	1	298	2	12	286
Hay Fever	1	17	282	1	14	285	1	46	252	0	41	257
Asthma	1	1	298	1	3	296	1	19	280	2	9	289
Pneumonia	1	31	267	1	36	263	1	33	266	0	28	272
Tuberculosis	1	1	298	1	2	297	1	1	298	3	0	297
Tonsillitis	1	186	113	1	106	193	1	113	186	1	147	152
Rheumatic Fever	1	0	299	1	0	299	1	8	291	2	9	289
Pertussis	1	229	70	1	215	84	1	202	97	2	3	295
Epilepsy	1	0	299	1	0	299	1	1	298	2	0	298

Appendix Table 6. Diseases reported as having been experienced by a sampling of freshman men who entered Oregon State University in 1930, 1940, 1950, 1960.

Item	1930			1940			1950			1960		
	unknown	yes	no	unknown	yes	no	unknown	yes	no	unknown	yes	no
Diphtheria	0	16	284	0	11	289	0	1	299	0	0	300
Smallpox	0	48	252	0	36	264	0	9	291	0	8	292
Mononucleosis	1	0	299	0	0	300	0	0	300	0	5	295
Hay Fever	0	10	289	0	37	262	0	32	267	0	62	238
Asthma	0	0	299	0	4	296	0	19	281	1	20	279
Pneumonia	0	38	262	0	39	261	0	49	251	0	43	257
Tuberculosis	0	0	299	0	1	299	0	1	299	0	0	300
Tonsillitis	0	169	130	0	88	212	0	96	204	0	107	193
Rheumatic Fever	1	0	299	0	0	300	0	1	299	0	5	295
Pertussis	0	199	101	0	183	117	0	153	147	0	2	298
Epilepsy	1	0	299	0	0	300	0	0	300	0	0	300

Appendix Table 7. Smallpox vaccinations reported by a sampling of freshman women and men who entered Oregon State University in 1930, 1940, 1950, 1960.

	Female Tabulation of Responses			Male Tabulation of Responses		
Year	unknown	yes	no	unknown	yes	no
1930	1	180	119	1	177	122
1940	2	242	56	1	221	78
1950	1	299	0	1	299	0
1960	0	300	0	0	300	0

Appendix Table 8. Frequency distribution of blood pressure of a sampling of freshman women and men entering Oregon State University in 1940.

Systolic Pressure			Diastolic Pressure		
Category (mm. Hg.)	Female	Male	Category (mm. Hg.)	Female	Male
1 - 70	0	1	1 - 40	0	1
71 - 80	0	0	41 - 45	0	2
81 - 90	0	8	46 - 50	6	2
91 - 100	63	34	51 - 55	0	5
101 - 110	116	64	56 - 60	35	29
111 - 120	82	96	61 - 65	17	29
121 - 130	25	64	66 - 70	59	88
131 - 140	7	22	71 - 75	35	36
141 - 150	0	4	76 - 80	118	63
151 - 160	0	5	81 - 85	7	16
161 - 170	0	0	86 - 90	15	25
171 - 998	0	1	91 - 95	1	1
			96 - 100	0	2
Mean	110.23	115.67	101 - 105	0	0
Standard deviation	9.50	13.97	106 - 110	0	0
			111 - 115	0	0
			116 - 120	0	0
			121 - 998	0	0
			Mean	72.56	71.71
			Standard deviation	8.35	9.62

Appendix Table 9. Frequency distribution of blood pressure of a sampling of freshman women and men entering Oregon State University in 1950.

Systolic Pressure			Diastolic Pressure		
Category (mm. Hg.)	Female	Male	Category (mm. Hg.)	Female	Male
1 - 70	1	0	1 - 40	0	0
71 - 80	0	0	41 - 45	0	0
81 - 90	2	2	46 - 50	0	8
91 - 100	23	14	51 - 55	4	2
101 - 110	104	48	56 - 60	32	26
111 - 120	100	111	61 - 65	29	16
121 - 130	55	94	66 - 70	103	92
131 - 140	10	21	71 - 75	28	33
141 - 150	0	5	76 - 80	82	95
151 - 160	1	4	81 - 85	9	19
161 - 170	1	0	86 - 90	9	7
171 - 998	0	0	91 - 95	0	0
			96 - 100	1	0
			101 - 105	0	1
Mean	114.89	120.66	106 - 110	0	0
Standard deviation	10.39	10.54	111 - 115	0	0
			116 - 120	0	0
			121 - 998	0	0
			Mean	71.72	72.63
			Standard deviation	7.65	8.35

Appendix Table 10. Frequency distribution of blood pressure of a sampling of freshman women and men entering Oregon State University in 1960.

Systolic Pressure			Diastolic Pressure		
Category (mm. Hg.)	Female	Male	Category (mm. Hg.)	Female	Male
1 - 70	0	0	1 - 40	0	1
71 - 80	0	1	41 - 45	2	0
81 - 90	9	1	46 - 50	4	0
91 - 100	42	9	51 - 55	1	1
101 - 110	100	57	56 - 60	51	38
111 - 120	99	122	61 - 65	23	18
121 - 130	43	77	66 - 70	103	88
131 - 140	6	28	71 - 75	31	39
141 - 150	1	3	76 - 80	74	86
151 - 160	0	1	81 - 85	7	16
161 - 170	0	0	86 - 90	4	11
171 - 998	0	0	91 - 95	0	1
			96 - 100	0	0
			101 - 105	0	0
Mean	112.62	120.08	106 - 110	0	0
Standard deviation	10.39	10.26	111 - 115	0	0
			116 - 120	0	0
			121 - 998	0	0
			Mean	70.08	72.43
			Standard deviation	7.88	8.37

Appendix Table 11. Frequency distribution of a sample of parents' age of freshman women and men entering Oregon State University in 1930

Age	Father		Mother	
	Female	Male	Female	Male
1-21	0	0	0	0
22-33	0	0	0	0
34-35	1	0	3	3
36-37	0	0	9	7
38-39	5	4	17	17
40-41	12	6	39	33
42-43	25	13	40	31
44-45	33	25	29	35
46-47	34	34	25	38
48-49	27	34	33	27
50-51	21	38	21	31
52-53	23	25	16	15
54-55	13	18	17	16
56-57	16	15	19	10
58-59	14	16	4	6
60-61	11	11	9	4
62-63	9	11	0	0
64-65	7	6	0	1
66-67	3	2	0	1
68-69	3	2	0	0
70-71	4	0	0	0
72-73	0	2	0	0
74-75	1	2	0	0
76-77	0	0	0	0
78-79	1	0	0	0
80-98	0	0	0	0
99 (age unknown)	3	7	2	6
Total responses	263	264	281	275
Mean	50.74	51.46	46.55	46.58
Standard deviation	7.76	6.85	6.19	5.92

Appendix Table 12. Frequency distribution of a sample of parents' age of freshman women and men entering Oregon State University in 1940.

Age	Father		Mother	
	Female	Male	Female	Male
1-21	1	0	0	0
22-23	0	0	1	1
34-35	1	0	2	2
36-37	0	1	9	9
38-39	2	3	30	34
40-41	11	13	40	33
42-43	22	27	32	31
44-45	45	29	39	27
46-47	26	25	29	22
48-49	31	24	24	26
50-51	41	44	21	35
52-53	18	23	17	18
54-55	21	16	11	7
56-57	9	12	10	14
58-59	19	21	8	10
60-61	9	12	1	4
62-63	5	9	3	0
64-65	2	6	0	1
66-67	2	3	0	0
68-69	1	2	0	0
70-71	1	1	0	1
72-73	0	0	0	0
74-75	1	0	0	0
76-77	0	0	0	0
78-79	0	0	0	0
80-98	0	0	0	0
99 (age unknown)	15	10	11	10
Total responses	268	271	277	275
Mean	49.72	50.64	45.58	46.23
Standard deviation	6.59	6.90	6.00	6.52

Appendix Table 13. Frequency distribution of a sample of parents' age of freshman women and men entering Oregon State University in 1950.

Age	Father		Mother	
	Female	Male	Female	Male
1-21	0	0	0	0
22-33	1	0	0	1
34-35	0	0	1	1
36-37	1	3	5	12
38-39	5	5	27	22
40-41	19	17	38	36
42-43	26	26	45	44
44-45	31	34	42	30
46-47	29	23	31	26
48-49	38	33	29	27
50-51	18	39	21	28
52-53	26	24	14	14
54-55	26	16	8	10
56-57	14	17	10	13
58-59	9	17	8	5
60-61	10	10	2	2
62-63	8	2	1	1
64-65	2	3	1	0
66-67	2	0	0	0
68-69	4	1	0	0
70-71	0	0	0	1
72-73	0	1	0	0
74-75	0	1	0	0
76-77	0	0	0	0
78-79	0	0	0	0
80-98	1	0	0	1
99 (age unknown)	11	13	10	14
Total responses	270	272	283	274
Mean	49.76	49.46	45.73	45.95
Standard deviation	7.03	6.49	5.64	6.37

Appendix Table 14. Frequency distribution of a sample of parents' age of freshman women and men entering Oregon State University in 1960.

Age	Father		Mother	
	Female	Male	Female	Male
1-21	1	1	0	6
22-33	1	0	0	2
34-35	1	1	2	6
36-37	1	0	6	15
38-39	6	11	23	28
40-41	19	21	39	43
42-43	32	28	44	36
44-45	35	33	47	36
46-47	37	34	34	28
48-49	40	41	27	24
50-51	37	23	27	13
52-53	25	20	22	20
54-55	22	19	9	10
56-57	8	9	6	8
58-59	6	7	5	3
60-61	7	7	0	2
62-63	5	5	0	1
64-65	2	3	0	1
66-67	0	0	0	1
68-69	0	3	0	0
70-71	2	0	0	0
72-73	0	0	0	0
74-75	0	0	0	0
76-77	0	0	0	0
78-79	0	0	0	0
80-98	0	0	0	0
99 (age unknown)	2	13	5	10
Total responses	287	267	291	283
Mean	48.32	48.33	45.50	43.90
Standard deviation	6.57	7.18	5.10	8.84

Appendix Table 15 Health status of parents of a sample of freshman women entering Oregon State University in 1930, 1940, 1950, 1960.

Item	Alive	If dead, cause: Organic	Infection	Violence	Unknown
1930					
Father's status	266	14	9	7	4
Mother's status	283	8	8	1	0
1940					
Father's status	283	11	5	1	0
Mother's status	288	4	6	2	0
1950					
Father's status	281	12	2	5	0
Mother's status	293	7	0	0	0
1960					
Father's status	289	5	1	5	0
Mother's status	296	2	2	0	0

Appendix Table 16 Diseases reported by a sample of freshman women entering Oregon State University in four different years as having been experienced by relatives.

	Heart	Diabetes	Cancer	Tuberculosis	Mental
1930					
Unknown	0	0	0	0	0
Yes	53	19	49	30	0
No	247	281	251	270	300
1940					
Unknown	1	1	1	1	1
Yes	55	32	59	37	0
No	244	267	240	262	299
1950					
Unknown	1	1	1	1	1
Yes	57	41	68	38	4
No	242	258	231	261	295
1960					
Unknown	0	2	0	2	2
Yes	64	47	93	20	2
No	236	251	207	278	296

Appendix Table 17. Health status of parents of a sample of freshman men entering Oregon State University in 1930, 1940, 1950, 1960.

Item	Alive	If dead, cause: Organic	Infection	Violence	Unknown
1930					
Father's status	271	8	16	3	2
Mother's status	281	7	6	1	5
1940					
Father's status	285	5	6	3	1
Mother's status	281	7	2	7	3
1950					
Father's status	285	10	3	2	0
Mother's status	288	8	3	1	0
1960					
Father's status	280	12	0	8	0
Mother's status	293	7	0	0	0

Appendix Table 18. Diseases reported by a sample of freshman men entering Oregon State University in four different years as having been experienced by relatives.

	Heart	Diabetes	Cancer	Tuberculosis	Mental
1930					
Unknown	0	0	0	0	0
Yes	46	18	42	20	0
No	254	282	258	280	300
1940					
Unknown	0	0	0	0	0
Yes	38	29	41	23	0
No	262	271	259	277	300
1950					
Unknown	0	0	0	0	0
Yes	41	28	53	28	4
No	259	272	247	272	296
1960					
Unknown	0	0	0	0	0
Yes	72	44	63	15	6
No	228	256	237	285	294