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June 29, 1978

THE RELATIONSHIP BETWEEN DEPRESSION AND SUICIDE
CRISIS CALLS AND WEATHER CONDITIONS

by

RICHARD PETER ^WROGGIA

A professional paper submitted in partial fulfillment
of the requirements for the degree

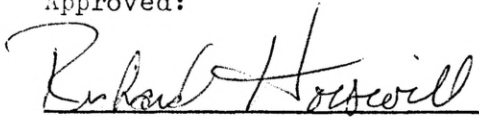
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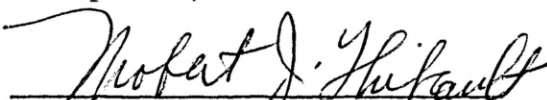
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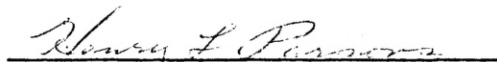
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ABSTRACT

The problem of this study has been to determine if there is any significant relationship between certain weather conditions: visibility, sea level pressure, temperature, wind direction, wind speed, barometric pressure; the hour of the day; the day of the week; and the months of the year and specific information: sex of the caller (male or female); type of contact (telephone or walk-in); type of call (depression, suicide contemplated or suicide attempted); action taken (not referred or referred) contained on case cards regarding depression and suicide received by the Bozeman Help Center, Bozeman, Montana.

The procedures for examining this problem consisted of the Chi Square Test of the relationships for the above mentioned variables on a total population of 974 calls for the years of 1972-1976.

The results of the data indicated that significance at the .05 level was found in the relationships of:

1. The month of the year as to the type of call.
2. The time of the day as to the sex of the caller, the type of call, and the action taken.
3. The visibility as to the sex of the caller, the type of contact and the action taken.
4. The temperature as to the sex of the caller.
5. The wind speed as to the sex of the caller and the type of contact.

All other relationships were found not to be of any significant relationship.

These findings strongly support this study in that there are certain weather conditions and time periods which have a significant relationship to depression and suicide crisis calls.

CHAPTER ONE

INTRODUCTION

Who gets depressed? Anybody, everybody?

Even the best adjusted person is vulnerable. The breaking point varies from individual to individual, which also implies variation in degree and duration of depression. Depression does not respect age, ethnic origin, religion, nationality, or socio-economic stratum. (Brussel and Irwin, 1973, p. 32)

Depression is an ancient malady, one probably present at the dawn of history. It appears today in all societies from the most primitive to the most complex. And when we turn to the past, we find this illness running like a dark thread through the whole fabric of man's recorded experience. (Kline, 1974, p. 24)

Clinicians as far back as the time of Aristotle have recognized man's changes in mood. Depression as a distinct state of human suffering is perhaps the oldest and most often described of all man's mental disorders. (Health Information Services, 1976, p. 4)

In the Fourth century B. C., (Gammer, 1969) Hippocrates, the Father of Medicine, described four temperaments of man, one of which was the melancholic (the depressive). We still use the term melancholia to characterize the hopeless, despondent condition of the depressed person. People knew of depression in the Middle Ages, too, as in ancient times, they construed it to be a spell cast by some

wicked force. Only toward the end of the eighteenth century did studies in newly established institutions and hospitals for mental disorders uncover the medical nature of mood disturbances.

It is now clear that the prevalence of depression has been badly underestimated: it ranks today as one of the nation's major health problems. In a special study on the "depressive disorders", the National Institute of Mental Health reported recently that at least 15 percent of all adults between the ages of 18 and 74 may exhibit significant and disabling effects of depression. (Health Information Services, 1976, p. 4)

The depressed person (Holme, 1972) is without hope and the present offers only despair. He loses initiative and is characterized by a lack of belief in his ability to accomplish the most routine mental and physical task. It is significant to note that more human suffering has resulted from depression than from any other single disease affecting mankind.

It is obvious that solid information regarding the identification and management of depression is essential not only to reduce the misery caused by this condition but to reduce the incidence of suicide, one of the 10 leading causes of death in the United States. (Beck, 1967, p. 1)

STATEMENT OF THE PROBLEM

The problem of this study was to determine if there was any

significant relationship between certain weather conditions: visibility, sea level pressure, temperature, wind direction, wind speed, barometric pressure; the hour of the day; the day of the week; and the months of the year and specific information: sex of caller (male or female); type of contact (telephone or walk-in); type of call (depression, suicide contemplated or suicide attempted); action taken (not referred or referred) contained on case cards regarding depression and suicide received by the Bozeman Help Center, Bozeman, Montana.

JUSTIFICATION FOR THE STUDY

Perhaps it might not be too fanciful to say that the Number One killer in the nation is not heart failure or high blood pressure or highway crashes, but the emotion that may lie at the root of all these--depression. (Freeman, 1969, p. 15)

Depression (Beck, 1967) is the most common psychiatric disorder treated in office practice and in-out patient clinics. Some authorities have estimated that at least 12 percent of the adult population will have an episode of depression of sufficient clinical severity to warrant treatment.

Prompt diagnosis and treatment of this condition is obviously a major health concern. Several retrospective studies of suicides in England revealed that most of the patients had been seen by their family physician within a few weeks prior to the suicidal attempt,

but despite the presence of telltale signs of depression, the diagnosis had generally been missed; consequently, appropriate treatment had not been instituted. The importance of promptly identifying the depressed person and getting that person the best treatment cannot be overstated. Swift diagnosis and treatment of depression could save much wasted energy and time. Energy lost in low achievement, interpersonal failure and even loss of life, has been caused by depression.

Dr. Cammer (1969) states, "When I say that depression is serious I do not mean that it is irreversible. The depressed person can recover. But I do mean that you should always take depression seriously, because those who experience this illness may plumb into such depths of misery that they will grasp at any measure to ease their mental pain. For example they may (1) attempt suicide; (2) stupefy themselves with alcohol; (3) drug themselves into oblivion; (4) withdraw to an isolated way of life."

The economic costs of depression are equally enormous. One recent study by the National Institute of Mental Health estimated that depression costs account for well over five billion dollars in terms of expenses for treatment and losses from reduced productivity. The conclusion is inescapable: whether measured in human or economic terms, the costly penalties of depression demand the attention of an informed citizenry. (Health Information Services, 1976, p. 5)

The time of the day, the day of the week, and the month of the year may be cues to setting off depression. Should an increase or a decrease in the number of depression and suicide calls be shown at a particular time, then this would be of interest to those professionals who have a responsibility of diagnosing depression. For, they would be aware of those particular time periods in which the greatest or least incidence of depression and suicide takes place. The professional person who is aware of the times when depression and suicide are at their greatest occurrence would be able to recommend the appropriate training for both professional and paraprofessionals for those critical times.

Knowing when depression and suicide is going to increase would be of benefit in providing advertising and community awareness programs at the times in which they would have the maximum effect upon both the professional and the depressed person.

In the crisis center situation, knowledge of these crucial times would provide a means for planning schedules in which those paraprofessionals most qualified to handle depression and suicide would be available at those times.

In those time periods when depression and suicide are at a minimum, the crisis center would require less volunteer help. Conversely, in the time periods when depression and suicide are at a maximum, the crisis center would require a larger number of volunteer

help. The information would be invaluable to those planning the programs of crisis centers; because, in periods when depression and suicide calls are low, time would be spent recruiting and training volunteers for the time in which depression and suicide calls are high.

Knowing the times in which most of the calls come in might be a means of justifying the existence of the center to the community which supports it. Finding out whether or not a 24-hour service is justified can be done if it is shown that there are a significant number of calls received after the hours in which the regular mental health facilities are closed.

If the staff manning the crisis center knew that under particular conditions or at certain times there was a significant difference in the sex of the caller, they would be able to plan to have the particular resources necessary that would be most advantageous to that caller. For example: if a volunteer doesn't work particularly well with men, then it would be best to schedule that volunteer for a shift in which he would have the least likely chance of contact with men and the most likely contact with women.

The same advantages would exist in the case of initial contact. Those volunteers that feel most comfortable working face-to-face would be best utilized on a shift when the maximum possibility of a walk-in occur. Those volunteers who work best over the telephone

would be scheduled when they have the maximum opportunity to work where they feel most capable. It would also be beneficial to those working at crisis centers to know the particular means by which people most often seek help.

The cases of depression and suicide are the most serious of all mental health problems. A one-time call handled by a crisis intervention center wouldn't be an effective means of rectifying those problems for any length of time. Referral and follow-up are extremely important. For the center staff to know what action has been taken is an important evaluation in measuring the effectiveness of their training and referral programs.

The weather may set off a depression. On a wet, gray day, we may feel as though the gloom and the sadness of the skies mirror our inner mood. As the rain ceases and the fog lifts, so does our depression.

Holidays bring depression to some. People (Freeman, 1969) who find themselves alone and think of everyone else as being with families and having fun grow dispirited. It is not unusual for some lonely old lady or man to hurl himself out of the window of a drab hotel room on New Year's Eve. Spring and summer are supposed to be times of enjoyment and yet there are those who grow most depressed then because they have no one with whom to share pleasure.

If this research has concluded that there was a relationship between

specific weather conditions, time periods, those who call, how they contact the center, why they call, and the action taken as a result of their call, then that relationship would be of interest to those who are entrusted with the duty of diagnosis and treatment.

GENERAL QUESTIONS TO BE ANSWERED

1. Is there a significant relationship between the months of the year and sex, type of contact, type of call, and action taken?
2. Is there a significant relationship between the days of the week and sex, type of contact, type of call, and action taken?
3. Is there a significant relationship between the time of the day and sex, type of contact, type of call, and action taken?
4. Is there a significant relationship between visibility and sex, type of contact, type of call and action taken?
5. Is there a significant relationship between sea level pressure and sex, type of contact, type of call, and action taken?
6. Is there a significant relationship between temperature and sex, type of contact, type of call, and action taken?
7. Is there a significant relationship between wind direction and sex, type of contact, type of call and action taken?
8. Is there a significant relationship between wind speed and sex, type of contact, type of call, and action taken?
9. Is there a significant relationship between barometric pressure and sex, type of contact, type of call, and action taken?

GENERAL PROCEDURES

This study was conducted by a personal review of the case cards on file at the Bozeman Help Center. All of the calls pertaining to depression and suicide which occurred during 1972-1976 were taken from the total number of cards on file. The hour of the day, day of the week, month of the year, the sex, type of contact, type of call, and action taken were taken off of each card. Each call was also compared with the weather data received at the Montana State University weather station for that particular hour and day in which the call was received. All of the data was entered into the computer at Montana State University. Percentages were used to determine any correlations.

LIMITATIONS

There were several limiting factors involved in this study. The population studied was limited to the case cards on file at the Bozeman Help Center. It was also limited in that not all the depressed persons in the Bozeman area will have called the Help Center for help concerning depression. It was difficult to tell if any of the calls were repeats.

DELIMITATIONS

The case cards were delimited to include only those cards in which depression or suicide were the primary categories. The cards used covered only the years 1972-1976. The weather conditions were delimited to the weather reports recorded at the weather station at M. S. U.

DEFINITION OF TERMS

1. Depression: Feelings of helplessness, hopelessness, inadequacy, and sadness.
2. Suicide: The discussion of/or the actual attempting to take one's own life.
3. Weather: Measured conditions of temperature, wind speed and wind direction, atmospheric pressure, and humidity at a given time.
4. Climate: Considered to be the average of conditions of temperature, wind speed and wind direction, atmospheric pressure, and humidity over long periods of time.

SUMMARY

Depression and suicide are a nationwide concern. Work needs to be done in the early diagnosis and treatment of depression and suicide so as to minimize the loss of productivity and life. An early recognition of those times and weather conditions in which depression and suicide are most frequent, can help the professional prepare the necessary means of intervention to meet the need of those who are suffering.

CHAPTER TWO

REVIEW OF LITERATURE

Depression is an emotional disorder that affects a large portion of our population. Its causes and symptoms are usually not recognized by the general population it affects--especially among the groups that have the greatest incidence towards it. Because depression affects such a large degree of the population, a great deal of study has been done by authorities in this field.

This review of related literature has contained a brief outline of some of the available literature concerning: 1. The relationship between depression and suicide; 2. Depression and suicide with reference to possible biometeorological effects; 3. Crisis intervention centers and their role in handling depression and suicide. This was designed to give a basic outline of depression and suicide in relationship to the weather. It has also examined the work of the crisis center as a means of intervention in the case of depression and

DEPRESSION AND SUICIDE

Eugene S. Paykel and Marcia N. Dineen did a study on the relationship between suicide and depression. (Journal of Nervous and Mental Disease, 1971, pp. 227-233. They took a sample of 189 depressed patients and did a follow-up for ten months after the initial treatment. They found that 13 of the individuals had made suicide attempts, one fatally, during the period. The study was composed of patients

in one mental health center and three different hospitals. They ranged in age from 21 to 65 and were of both sexes. The method used was a pre-screening interview and then another interview taken ten months later. It was found that patients who made suicide attempts in the follow-up period were younger (mean age 29.7 years) than those who made no attempt (mean age 36.4 years) and the difference was significant at the 1% level. In the follow-up interviews, those persons who had made suicide attempts evidenced more depression than those who had made none in the intervening ten months. They were also rated more hostile.

The picture of the future suicide attempts emerging from these findings were, however, a fairly constant one. Compared with other depressed patients, the attempter is more likely to be young, and have a history of previous suicide attempts, previous hospitalization and excessive drug use. It is important that these younger depressives with evidence of character disorder, neurotic depression, hostility, and previous suicide attempts should be recognized as a highly vulnerable group. (Paykel, 1971)

Coleman, (1972) in relationship to depression and suicide said, "An estimated 75-80 percent of suicides are associated with severe depression." Often the individual is hurt and discouraged and seems to retreat into himself in an attempt to "comprehend" what is happening and to think through a course of action. Unfortunately, as we have seen, during periods of intense stress the individual's ability to

think rationally is often impaired. (Motto, 1969)

Lester and Lester (1971) pointed out that many suicidal people are depressed at some time before the actual suicide attempt. There seems to be a tendency for depression, confusion, and anxiety to clear shortly before the suicidal act, so that during the preceding day or so the suicidal person may appear calm and optimistic. This may be due to an improvement of mood once the decision to commit suicide has been made. In severely depressed patients, suicide is much more likely when the person is beginning to recover than when he is at the stage of deepest depression. Suicide is also very common among mental patients who have just been released from the hospital.

Pokorny (1964) completed a study in which he used for a population those who had completed suicide. Each of the people in the population had been hospitalized prior to the suicide. It was found that manic-depressive psychoses have the highest reported rates of completed suicide, while the neuroses have the lowest. Out of the 1,193 cases studied, it was found that 566 or 47.4 percent were of depressive psychoses. "The high rate of completed suicides among manic-depressives is logical. The seriously depressed person sees the world as a totally uninviting place. His view of the possibilities for his life becomes very restricted, since there are few things that seem worth doing." (Lester and Lester, 1971)

Gittleson (1966) found that there was a difference among patients

with depressive psychoses. Some depressive patients have obsessions-- uncontrollable thoughts about some topic that recur repeatedly--while others do not. The attempted suicide rate was lowest in the patients who had obsessions and highest in those who did not. 5.9 percent of the obsessive depressed patients attempted suicide, as opposed to 38.2 percent of the non-obsessive depressed patients. In some way, the obsessions may have served as a defense mechanism which protected the patients against suicide. The constant preoccupation with an obsessive idea may keep the patient too busy to think about suicide. The intrusion into his thoughts may prevent him from thinking about anything long enough to take action.

Stengels(1965) study consisted of two groups. Group one had a population of 138; all of which were admissions for attempted suicide to a London psychiatric observation ward during the year 1946. which were about 10 percent of the total amount of admissions to the observation ward. Ninety had come from general hospital wards where they had been taken immediately after the suicidal attempt. It was found that of the 138, 94 were diagnosed as suffering from depressive illness or other abnormal depressions. "In the majority of the cases, the suicidal attempt had precipitated by stressful experiences not arising from mental illness. In those cases the attempt had been carried out in a state of reactive depression, which in a considerable number was due to physical illness." (Stengal, 1965) Most of the attempts (20) occurred

in May.

Group two consisted of seventy-six unselected patients admitted to a medium-sized general hospital in London after a suicidal attempt. Of the 76, 65 were diagnosed as suffering from depressive illness or abnormal depressions. In summary of this study, it was concluded that there is a special need for the general practitioner to be aware of the type of person who could belong to this group. It was estimated that in this country every general practitioner must have about 10-20 such people among his clientele. It would be important to identify them because they are in need of special attention.

CAUSES AND SYMPTOMS OF DEPRESSION AND SUICIDE

Merskey and Lawton-Tonge (1965) have postulated that there are four basic causes of depression. They suggest that any of these factors may give rise to a depressive illness either singly or in combination. The causes are: socially determined depression; depression caused by physical agencies; psychogenic depression; and, endogenous depression, where the cause is unknown. To this list, Watts (1966) added one of his own--physiological depression. He said, "Under certain circumstances depression is a normal reaction. . . Many women experience a recurrent depression each time they have a menstrual period. Other physiological mood swings occur during pregnancy. . . Normal grief reactions, because they are universal and at times happen to all of us, can in a sense be called physiological."

The same causes and symptoms that apply to depression are to be examined in the review of the causes and symptoms of suicide.

Socially determined depression, however, is depression produced by social factors, such as: bad housing, overcrowding, unemployment, war or an environment like weather. In a study done at the South Pole, "Novel Behaviors in an Extreme Environment", (American Journal of Psychiatry, 1974) a study was done on a 22-man compliment of navy men and scientists at an isolated station. The station was free from human contact for eight months. At the end of eight months, a questionnaire was given to the crew. Some of the questions were: Have you become more depressed during the winter? Did you move more slowly as the winter went on? A final section of the questionnaire requested the subject to rank-order colleagues in terms of the five men who stared the most and the five men who were most depressed. The findings were that three of the first five listed by the group as "starkers" were among the first five listed as "depressed" by the group.

Staring was linked to self-reporting depression. It was felt that a formal self-rating scale for depression should have been used. The data reported here, however, at least raises the question of whether staring may be either a symptom of depression or an equivalent. The data also suggested a possible relationship between drifting and depression. The findings of the study suggested that extreme environment had the symptomatology of depression.

Frank J. Ayd, Jr. (1961) has said that for years it has been observed that there is a seasonal variation in the incidence of manic-depressive illnesses and in suicide. Spring and fall are the two periods in the year when most manic-depressives become ill. This seasonal incidence of time of onset has been a constant phenomenon for many decades in various countries. This is well exemplified by those who have a recurrence of their illness every spring or fall and by those whose attacks are years apart but always start at approximately the same time of the year. This influence of the seasons on the occurrence of manic-depressive illnesses accounts for the common observation of many people that a specific month or season is the best or the worse time of the year for them. It is possible that a goodly portion of such individuals is undergoing a mild manic-depressive reaction. The seasons not only influence the time of onset of most manic-depressive illnesses, but also the course of the illness and its time of termination. Many depressives who become ill in the fall have some remission in the summer with a deepening of the mood in the autumn. Others whose attacks begin in the spring feel better temporarily in the fall and then depressed again. Usually the termination of this illness also is in the spring and fall.

Mills (1939) in his study of storm patterns in comparison to mental instability and suicide found that mental instability seemed to be influenced by the instability of the weather and by the frequency and

suddenness with which storm changes pass over a given region. "As our storm centers sweep down the plains from the northwest, then turn back up the Mississippi and Ohio River valleys to pass out over the Gulf of St. Lawrence, they leave behind them a trail of human wreckage--cases of acute appendicitis, respiratory attacks of all kinds and suicides." (Mills, 1939)

Over the country (Mills) east of the coast states, the movements of low pressure centers, which cause cyclonic storms, showed a marked distribution of suicide rates along the pathways of these storms. From 1929 to 1933 "there was a rather marked northward shift in the storm tracks across the continent, but in the five year period . . . the cyclonic centers pursued a more southerly course".

There was a relationship shown between cyclonic storm pathways and suicide frequency. In order to investigate this relationship more closely, Mills collected data on a day to day basis from an area of sufficient population to give a fairly large daily distribution of cases. Data on the daily occurrence of suicides were collected for five years ending with 1932. They included counties which had the cities of Cincinnati, Hamilton, Dayton, Springfield and Columbus in Ohio; Newport and Louisville in Kentucky; St. Louis in Missouri, Indianapolis in Indiana. The area covering these cities usually feels the effects of storm passages within a 24-hour period as the centers go

across the country, so the area can be considered a fairly unified weather district.

The suicide cases for this area were graphed daily, and underneath them was placed a graph of the daily mean temperature deviation from the normal and a continuous graph of barometric pressure throughout the period. It was found that there is a distinct relationship between falling barometric pressure and rising suicide incidence. Time after time in the five year period peaks in suicides were found to coincide with low pressure crises. It was found that usually suicides decline with falling temperatures. In continuing his research Mills (1939) found a relationship between suicides and barometric pressure fluctuations in New York and Denver. He found a marked tendency for suicides to occur at reduced pressure levels and to be infrequent on days of higher pressure. Suicides on the days of lower pressure were many times more frequent than on high pressure days. His methods of handling the data seem to have been adequately controlled.

* Dublin (1963) using the National Office of Vital Statistics for information found that in the years 1910-1923 inclusive, the peak of suicides occurred in May. Beginning with June on through the summer, autumn and early winter the frequency of suicide decreased until the lowest point was reached in bleak December. Through January, February, March, and April the suicide rate increased steadily, approaching the high point in May. In 1960 he found that the high point still occurs

in the spring months (April and May), and the low in December, but the differences between the months and seasons are not as marked as in the earlier period.

Dublin (1963) discusses the seasonal data for the largest cities of the country:

In 1959 in cities with a population of 100,000 or more, the maximum death rate from suicide occurred in June and the minimum six months later. . . . Similar differences in the seasonal indices appear in the figures for England and Wales--maximal rates between April and June and minimal during the winter period. If there is a real connection between the incidence of suicide and the changes of the seasons, it should show up in an opposite monthly distribution of suicides in the southern hemisphere. Data for Australia (and Brazil) show that there is a tendency for the highest rates to occur in the last quarter of the year. In other words, there is a six-month difference from that found in countries in the northern hemisphere.

Concerning suicide and holidays, Lester and Lester (1971) quoted Blachly and Fairly (1969) who found that high suicide rates for some holidays (for example, Pearl Harbor Day--a holiday not noted for elaborate festivities) and low rates for others (such as Memorial Day.) However, the suicide rate for all holidays combined was not significantly different from that for the whole year. In their investigation

of the day of the week and suicide they divided the suicides they were investigating into two groups: people between forty and sixty-four years of age and those between birth and thirty-nine or over sixty-five years of age. They found a high incidence of suicide on Mondays for the first group, but no specific trend for the second group.

Shneidman and Farberow (Lester and Lester, 1971) have found that significantly more suicides occur between noon and 6:00 P.M., and significantly fewer between midnight and 6:00 A.M. However, it is not always possible to determine exactly when a suicidal act occurred, so these results are based on incomplete samples.

DeRudder and Tholuck (Tromp, 1963) studied 200 cases of suicide, recorded during 1939 at the Institute of Forensic Medicine of the University of Frankfurt (Germany). Whereas no relationships could be established with atmospheric pressure, temperature, hours of sunshine and precipitation, a highly significant correlation was found with weather fronts, both cold and warm.

Depression Caused by Physical Agencies

Concerning physical agencies which cause depression, K.A. Achter (1964) said, "All severe organic diseases entail a risk of secondary depression, and it has been claimed, for example, that pancreatic carcinoma and pernicious anaemia are specifically associated with a marked susceptibility to depression. Depressive and neurasthenic

syndromes may also occur in connection with the after-effects of infectious diseases, as well as in patients convalescing from various other illnesses." His article also includes such agencies as alcohol, tranquillising drugs, birth-control pills and infectious diseases.

Ari Kiev (1974) in his article concerning bio-chemical aspects that lead to depression, wrote that female sex hormone levels are related to depression. Also, the thyroid and adrenal disorders affected by stress can be causes of depression.

Tromp (1963) in his book, Medical Biometeorology, showed that there was a relationship between the hormonal secretion of the pituitary gland, the thyroid gland, the adrenal gland, parathyroid gland and meteorological factors. In the case of the hormonal secretion of the pituitary gland it was found that production of growth and gonadotrophic hormones decreased in winter, increased in early spring; increased production of thyrotrophin and adrenotrophin in winter. "The data on hand indicate a very intimate relationship between weather (e.g. influx of cold polar air masses), hypothalamic stimulation and secretion of anti-diuretic hormone by the posterior lobe of the pituitary (being decreased with polar air influxes causing a sudden steep increase in diuresis). Similar influences are known in relation to the hormonal secretion by the anterior lobe of the pituitary." (Tromp, 1963)

In the thyroid gland cold produces intense activity of the gland. The activity manifests itself by intense congestion of the

intra-alveolar capillaries and by disappearance of the colloid from the alveoli. The congestion of intra-alveolar capillaries may be so intense that haemorrhages into the center of the alveoli may occur. Warmth induces inactivity of the gland.

Tromp states that cold stress creates hyperthyroidism and hypertrophy of the adrenal cortex:

In view of the many physiological processes affected by the adrenal gland and considering the great sensitivity of the adrenal gland to meteorological changes in the environment, it is clear that weather might act as a trigger for many physiological and pathological phenomena, provided these processes have reached a stage close to the morbidity limit of the particular organs.

The parathyroid gland is influenced by cold. Cold stress seems to create a parathyroid deficiency and fall in calcium level of the blood serum. According to Tromp low magnesium values are found more specifically in those periods when the mean minimum temperature is lowest for the year, but also in all periods when temperature falls below 5.5°C . and sunshine is scarce, rainfall preceding the period is high and of frequent distribution, winds are strong and frequent, precipitation is accompanied by hail or snow. In other words, many periods preceded by active cold fronts and the influx of cold polar air are particularly favourable to the creation of the magnesium deficiency and its clinical consequences.

Peterson (1947) did a study in which he compared maximum and minimal daily temperatures, barometric pressure and day by day suicide for the months of July and August of 1940 in the city of Chicago. In comparing the pressure peaks and troughs with systolic and diastolic blood pressure, he found that:

The trends confirm the underlying concept that the individuals committed suicides when the oxidative situation of the organism, as conditioned by blood pH and blood pressure levels, was disturbed to an extent that a normal adjustment to some impelling environmental situation was prevented, and the emotional response reflected the underlying autonomic dysequilibration. Suicides during July and August 1940 occurred in periodic manner and were related to the organic rhythm observed in the triplet material. The small number of cases involved in the study do not, however, permit definite assurance that similar results would hold true for longer periods of time. (p. 187)

Psychogenic Depression

Psychogenic depression is made up of causes that society usually associates with depression. In his book, Up From Depression, Leonard Cammer (1969) labels a few of these causes: "depression caused by loss through death; interpersonal relationships, i.e. wife, lover, parent; situation changes, such as retirement, geographical uprooting, isolation, and loneliness."

Endogenous Depression ←

This last cause of depression is labeled by Watts (1974) as the one we know the least about. Yet, Watts tells us that it "is probably the most common and often the least recognized depressive disorder occurring in the community." It is given the name "Melancholia". It appears to come from within. It is endogenous. According to Watts:

Something temporarily upsets the brain chemistry, and the governing mechanism is put out of action or works in a defective manner, Pleasurable sensations cannot get through to consciousness. The patient cannot appreciate the beauty of the most lovely view. The colour has gone out of life, which has become a series of drab greys and black. Life has become something sinister and meaningless, and he is lonely in a strange bleak world of his own." (p.21) ←

In 1969, Landsberg divided the day into six weather phases. Twenty thousand visitors at a traffic exhibition in Germany were tested to see if human reaction times showed a link to the weather. During weather phases 1 and 2 the people tested showed fast reaction times. Slow reaction times prevailed during the phases of 3,4, and 5. A large number of people were particularly slow in weather phase 4. In phase 6 the reaction times were average. weather phase 4 is associated with poor weather and often has electrical disturbances. All the data were carefully analyzed by modern statistical tests so that little doubt about their validity exists." (p. 95)

Yet these subtle weather effects (Landsberg, 1969) seem to extend into industrial accidents as well. He states:

These show a pattern very much like the reaction time. In an industrial plant of six thousand workers, during twenty million wage-hours several thousand accidents occurred. Many of them were minor in nature, but nonetheless work time was lost. Here again days with weather phases 3 to 5 had an above-average number of accidents, but phases 6, 1, and 2 showed fewer accidents than the average of all days. Reaction time changes undoubtedly contribute to this distribution of accidents. In the usual course of weather events rapid pressure changes are associated with frontal activity. When that type of weather prevails, all individual elements fluctuate rapidly. Why weather phase 4 in all likelihood should lead to mental depression, which may end in self-destruction, is not known. (p. 93)

A description of each of these weather phases is necessary.

Weather phase 1 is the phase of weather in which there is the greatest calm. It's a high pressure area, little cloudiness, average humidity, average temperature and the area just after the storm front has moved. Weather phase 2 is when the storm front is moving from a lower to a higher pressure area. The prevailing winds are to the northeast. Weather phase 3 is the time in which the storm has ended. It is characterized by the lowering of wind speed, a rise in pressure and

more sunlight. Weather phase 4 is the phase of the storm. Extreme cloudiness, low pressure, strong winds. Weather phase 5, winds come from the north and blow in the direction of southeast. Weather phase 6 is a high pressure area with a lowering of pressure as it becomes weather phase 5.

Landsberg (1969) said that a possible explanation for the fact that people were so affected mentally during weather phase 4 was that weather phase 4 is one high in electric activity. "One hypothesis surmises that there is an interaction between fluctuating electric fields and human brain waves." (p. 94)

Stengel (1965) found that only in a small number of cases could the onset be related to a precipitating event. In most of the cases depression seemed to occur without any known cause. For this reason it has been called endogenous depression. He discovered that it can subside totally after several months but it has a strong tendency to occur again and again. Its main danger (of endogenous depression) is suicide.

Depressive illness or melancholia is the mental disorder with the highest suicidal risk. . . .These observations illustrate the vital importance of early diagnosis and treatment of depressive illness. Its recognition is not always easy because depression is such a common condition and the differentiation of a depressive illness from an excessive depressive reaction to an upsetting

event of everyday life, such as bereavement or disappointment, is often difficult, especially for the inexperienced. These so-called reactive depressions, which differ only in degree from normal depressive reactions, may also lead to suicide, but this danger is less than in endogenous depression. (Stengel, 1965)

All of the symptoms that result from these causes are basically the same. Crory and Crory (1973) in their article, "Depression", gave symptoms for recognizing depression. These symptoms are divided up into these categories: physical changes, such as, a change in sleeping patterns, a change in bowel habits, weight loss of five to twenty pounds, decreased drive and psychomotor retardation; psychological changes--impairment of concentration, lack of interest or energy, and memory loss; and, emotional changes--such as, low self-worth, hopelessness, worthlessness, irritability, and hostility.

Depression (Young, 1971) afflicts millions of Americans annually, but in only thirty thousand patients will it be recognized and treated. Out of every 200 depressed persons, it is estimated that one will commit suicide.

CRISIS CENTERS AND DEPRESSION AND SUICIDE

Shneidman and Mandelkorn in 1967 had this to say concerning the goals of the crisis center involving suicide: "These cases are the most serious at the moment of the call. Here, the telephone therapist cannot hope to solve all the problems that a deeply troubled person

faces. But even this . . . can be averted, because suicidal crises can be managed."

Shneidman and Mandelkorn expressed the idea that people who work in suicide prevention services must realize that their goals are limited. The primary objective of the worker is to prevent the caller from killing himself, not to remake his personality. The caller may be suffering from any number of psychological problems, which are sometimes linked with body ills. "But curing all the caller's troubles, no matter how serious, is not the major intention of a suicide prevention service" since the prevention of suicide need have only limited mental health objectives. An active suicide prevention service has a definite limit of goals. It should provide a ready contact between the community's "highly disturbed citizens and the established helping agencies which are available for them".

Wesley Davidson, a former director of the Bozeman Help Center, has said, "It is my opinion that it is vital that the total approach . . . should be geared toward the referral. This can be accomplished quite easily with a little effort on the part of the volunteer." (1972) Wesley felt that the volunteer must be consciously working toward the referral. As "the volunteer does this he will find that the stage is being set for referral through the entire crisis intervention process".

The ability to refer depends on how well the crisis center is integrated into the network of community helping agencies. Farberow,

(1965) regarding referrals states:

If it is agreed that the suicide prevention service is primarily a short-term emergency service, it is clear that many patients will need follow-up rehabilitative care from other helping resources in the community. No suicide prevention center can function completely alone unless it is part of a mental health complex which includes all services as part of its design. . . . Clear channels of communication between the agencies will permit not only the important transfer of responsibility, but also provide follow-up information, significant in agencies in which a brief contact produces frustration in not providing the eventual outcome.

Other agencies in which it is necessary to develop a good working relationship are hospitals and the police. Sheila Fisher, PH. D., (1973) states that Farberow suggests that "since there will be some clients or callers who must be hospitalized immediately, arrangements should be made to effect easy entry". It was found that people who are undergoing a serious crisis need to have their communication taken seriously or else there may be a more successful suicide the next time. He also found that there a lack of an empathic response from the emergency room personnel to clients as they come in. In smaller communities where other crisis centers' resources are not available these problems occur more often. These problems need to be

anticipated and dealt with beforehand. Another agency that Farberow felt was vital to the effectiveness of a suicide prevention center is the police. In some cases someone who has attempted suicide must be rescued and the police are the only ones who can break down the door. In a situation in which a person is waving a gun threatening to end it all, the police along with a crisis worker are the ones sent to the rescue.

The most important thing after the center has been established and has good relationships with the community is the functioning of the center. A vital aspect of this functioning is the staffing, training, and services which the center provides.

Motto (Motto, Brooks, Ross and Allen, 1974) states that "the non-professional volunteer has become recognized as the major source of manpower for the delivery of crisis services". Eighty percent of the workers are non-professional volunteers. This was found to be especially true for a 24-hour emergency telephone referral facility. Using volunteers is one "method of mobilizing a community and extending suicide prevention into the community".

Motto, et al, states:

It is important that all suicide prevention workers be included in the service's training program, regardless of their academic or professional backgrounds. . . . The task of the staff of a suicide prevention and crisis intervention center is unique and specialized

(and) specific training; in this work should be required of all who participate in it.

The training should consist of basic teachings in suicidology, an acquaintance with the role and facilities of referral agencies and other collaborating resources, ethical considerations, and an understanding of the record keeping process of the center.

The service that the center provides is that of crisis intervention. McGee (1974) divides crisis intervention into four phases. Phase 1-- The Opening of a Case. The crisis worker has the problem of establishing sufficient trust and rapport between the client and the service, so that the client will not hang up and break the communication before some helping relationship can be established. In determining what type of case a client presents, the worker must first make a determination as to whether or not the threat of suicide is present. This means that the volunteer not only must learn whether some life-threatening action has already been taken, but he must uncover the existence of serious contemplations by the client. Usually, this determination is best made by careful and sensitive listening rather than by direct interrogation, although the latter is sometimes necessary and, in such cases, never should be avoided. Finally, a function of the client assessment "relates to making the determination of whether a case is one of acute crisis or one of chronic maladjustment and characterological dependency".

Next, the crisis center worker develops a plan of action. The

plan may include a referral to another resource for continued help. In many cases, it may be that the crisis center itself is the only reasonable source of help needed in the present crisis, or that the crisis center should become the manager of the case.

Phase II--The management of a case. McGee states that "after the action has been developed, the obvious next step is to begin to implement it".

When an anonymous, highly suicidal person (Jacobs, 1968) is on the phone, quick action is required. The police may need to be called by another volunteer to trace the immediate call. An ambulance may be needed to rush the overdosed individual to the emergency room. "The mother of six who was abandoned by her husband may need nothing more than milk for now and an appointment with the proper public agency in the morning. Others may need to be referred for further evaluation and treatment." (p. 13)

Phase III--The closing of a case. This phase consists of the completion of Phase I and II and the recording of the results in the record system of the center.

Phase IV--The follow-up of a case. This phase is one in which follow-up can be done on the person giving the call, the one receiving the call, the agency the call was referred to, if referred, and the family of the person who may have successfully or unsuccessfully attempted suicide.

Resnik and Hathorne (1973) have suggested some other means in which crisis centers can be effective in the prevention of suicide:

In considering the problem of the professional manpower shortage as it relates to suicide prevention in the context of an increasing focus on seriously suicidal patients, their more successful recognition and long term treatment, in terms of the question of the use of volunteers in suicide prevention activities, it is suggested by the task group that experimental programs utilizing volunteers to maintain systematic follow-up calls or communications with patients known to be high suicidal risks might prove useful in suicide prevention programs. (p. 93)

At the professional level it is suggested that a campaign to remind general physicians to educate themselves to the probable lethal dose of any sedative or tranquilizing medication prescribed, and limit the total dose in prescriptions to amounts below these levels in itself would probably have a discernible affect in preventing suicide. Further efforts aimed at the education of counselors, teachers, and policemen in recognizing symptoms of severe depression and social behaviors preceding suicide would probably also have significant effects. (p. 94)

For individuals who are apt to commit suicide, a great deal of attention should be given to the "development of effective detection and treatment programs". Yet, "the search for other levels of

interventions must continue". (Reskin and Hathorne, 1974) A decrease in suicide deaths may happen as a result of increasing development and understanding of knowledge about the suicidal individual to both the professional and sub-professional groups. Even education of the public in general may facilitate the decrease in suicide deaths.

SUMMARY

It appears from the results of the previous research that the following conclusions are merited:

The literature has shown a close relationship between depression and suicide. This chapter has also been an examination of the causes of depression and suicide. It was found in the literature that for each of the causes there were possible biometeorological relations. In the literature it was found that crisis intervention centers can be an effective means of dealing with both depression and suicide. The literature stressed the importance of early diagnosis and treatment of depression and suicide.

The need for extensive training among crisis center workers in recognizing and treating depression and suicide has been shown to be an important part in crisis intervention.

The literature has also shown that the effectiveness of this type of crisis intervention depends on the relationship of the crisis center staff with the professional community.

CHAPTER THREE

PROCEDURES

The problem of this study has been to determine if there was any significant relationship between certain weather conditions: visibility, sea level pressure, temperature, wind direction, wind speed, barometric pressure; the hour of the day; the day of the week; and the months of the year and specific information: sex of the caller (male or female); type of contact (telephone or walk-in); type of call (depression, suicide contemplated or suicide attempted); action taken (not referred or referred) contained on case cards regarding depression and suicide received by the Bozeman Help Center, Bozeman, Montana.

The purpose of this chapter has been to examine the procedures that were undertaken in the investigation of these relationships. This chapter has discussed the population and the sampling procedures; the categories under investigation; the method of collecting and organizing data; the hypotheses; the analysis of the data; and the precautions taken for accuracy.

POPULATION

The population consists of all the case cards whose major problem area is depression or suicide on record with the Bozeman Help Center for the years of 1972-1976. The total population of 974 calls were used for this study on depression and suicide calls and the weather conditions.

CATEGORIES OF INVESTIGATION

The categories that were investigated are:

1. The relationship between the months of the year and sex, type of contact, type of call, and action taken?
2. The relationship between the days of the week and sex, type of contact, type of call, and action taken?
3. The relationship between the time of the day and sex, type of contact, type of call, and action taken?
4. The relationship between visibility and sex, type of contact, type of call, and action taken?
5. The relationship between sea level pressure and sex, type of contact, type of call, and action taken?
6. The relationship between temperature and sex, type of contact, type of call, and action taken?
7. The relationship between wind direction and sex, type of contact, type of call, and action taken?
8. The relationship between wind speed and sex, type of contact, type of call, and action taken?
9. The relationship between barometric pressure and sex, type of contact, type of call, and action taken?

Dependent and Independent Variables

The cards studied were controlled by only including those cards that have as their major problem depression or suicide in the years

1972-1976. The dependent variables are: sex of the caller, type of contact, type of call, and action taken. The type of contact includes only those callers who contacted the Bozeman Help Center by telephone or by walking in. The type of call includes those calls whose major categories were defined as depression, suicide contemplated, and suicide attempted. The action taken consisted of those calls which were either referred or not referred.

The independent variables are: months of the year, days of the week, hours of the day, visibility, sea level pressure, temperature, wind direction, wind speed and barometric pressure. The months of the year were divided into the twelve segments of the year--January through December. The days of the week were divided into seven segments--Monday through Friday. The hours of the day were divided into six segments of four hours each: 1:00 A.M. to 4:00 A.M.; 4:00 A.M. to 8:00 A.M.; 8:00 A.M. to 12:00 P.M.; 12:00 P.M. to 4:00 P.M.; 4:00 P.M. to 8:00 P.M.; 8:00 P.M. to 12:00 A.M.

Visibility was divided into the segments: 0 to 5 miles; 5 to 10 miles; 10 to 15 miles; 15 to 30 miles; 30 and above miles. Visibility is reported in statute miles and fractions. Visibility is the degree of clearness of the atmosphere and the greatest distance toward the horizon that prominent objects can be identified visually with the naked eye. Sea level pressure is a unit of pressure equal to the

pressure of the air at sea level or approximately 14.7 pounds to the square inch. For the purpose of this study the sea level pressure was divided into milibars which is the statute of measurement used for measuring sea level pressure at the weather station at Montana State University, Bozeman, Montana. The tables were divided into: 0 to 100 mbs; 101 to 165 mbs; 166 to 251 mbs; 252 to 999 mbs. The average sea level pressure in Bozeman was found to be 165 mbs.

Temperature was divided into five segments: 24° F. and below; 25° F. to 34° F.; 35° F. to 54° F.; 55° F. to 64° F.; 65° F. and above. The average daily temperature for the period under study in Bozeman was 44.9° F.

Wind direction was distributed into segments of eight sections of 45° angles: North to Northwest--0-45°; Northwest to West--45°- 90°; West to Southwest--90°- 135°; Southwest to South--135°- 180°; South to Southeast--180°- 225°; Southeast to East--225°- 270°; East to Northeast--270°- 315°; Northeast to North--315°- 360°. Out of the 974 calls there were a total of 173 calls in which there wasn't any wind speed registered; therefore, there wasn't any wind direction for these calls.

Wind speed was distributed into three segments: 0--in which it was calm (no wind speed registered) to 5.5 knots per hour; 6 knots to 10 knots; 11 knots to 66 knots per hour.

Barometric pressure was distributed into three categories: 25.020 ins. to 25.300 ins.; 25.301 ins. to 25.600 ins.; 25.601 ins. to 25.905 ins.

METHOD OF COLLECTING DATA

The data collected is found on the permanent records of the case cards at the Bozeman Help Center, Bozeman, Montana. (An example of this card is found on Appendix A of this project.) The process for the completion of the case cards is as follows:

1. The initial contact with the Bozeman Help Center by the client.
2. Discussion by the client with the Bozeman Help Center worker concerning the major problem area.
3. The ending of contact, the resolvment of the problem or referral given.
4. The filling out of the pertinent data of the encounter on the case card.
5. The placement of the case card in the daily file.

Each day the case cards for the proceeding day are reviewed by the Center director. If there is a discrepancy between the description of the call and the major problem area, the director confers with the worker who handled the call to correct it. In their initial training, each worker is individually shown the methods for filling out the case cards and the criteria for the choosing of major categories on the card. The criteria for choosing the problem areas of depression and suicide are:

1. Depression is defined as feelings of helplessness, hopelessness,

inadequacy, and sadness.

2. Suicide is defined as the discussion of and/or the actual attempting to take one's own life.

Every other week there is a staff meeting. If there is any discrepancy, it is again discussed and the staff review again the process of choosing a category. Each six months there is a new training session and the method of filling out the cards are reviewed again by each worker. After this process is completed, if there aren't any discrepancies, then the individual case card is put in the permanent file. The validity of the case cards as an accurate measure of depression and suicide was determined by a graduate committee who are each specialists in the field of counseling.

The method of collecting the data for this study was individually looking up each case card in the permanent file and separating from that file all the case cards whose problem area was depression, suicide contemplated or suicide attempted. From each of these cards the following data was taken: the day, the month, the year, the hour, the sex, type of contact, type of call, and action taken. This data was then taken to the weather station at Montana State University, Bozeman, Montana. It was compared to corresponding data concerning the same year, month, day and hour of the day. From the corresponding data found at the weather station were taken: visibility, sea level pressure, temperature, wind direction, wind speed and barometric pressure. It

was then introduced into the computer at Montana State University, Bozeman, Montana. The results were received and organized into tables. (See Tables 1-9) The information on the tables were then coded and processed through the computer for analysis by means of the Chi-Square (χ^2) Test. The results of this analysis were then added to the tables. These results are indicated by Chi-Square (χ^2) equals; degrees of freedom (DF) equals; asterisk (*) indicates significance beyond .05 level. The organization of this study and collection of data was completed in the time period of November, 1977 to May, 1978.

HYPOTHESES

The null hypotheses are:

1. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the twelve months of the year.
2. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the seven days of the week.
3. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the hours of the day which were divided into six segments of four hours each.
4. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the

five visibility segments.

5. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the four levels of sea level pressure.

6. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the five temperature groups.

7. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the nine divisions of wind direction.

8. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the three categories of wind speed.

9. There is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the three levels of barometric pressure.

The alternative hypotheses are that there are significant relationships between all of the above.

ANALYSIS OF THE DATA

The testing of all of the nine hypotheses was accomplished by means of the Chi-Square (χ^2) Test. "The χ^2 test tells you whether the independent variables have significantly different distributions across the categories of the dependent variables and may thereby be

considered to have been drawn from different populations. That is, it tells you whether the frequencies obtained in the cells of the table are different from the frequencies you might expect based on chance variation alone. Thus, the χ^2 test compares obtained frequencies to expected frequencies and indicates the probability that they are different. The basic formula for computing χ^2 is as follows: "

$$\chi^2 = \sum \frac{(o-e)^2}{e}$$

(Tuckman, 1972, p. 248)

The testing was primarily concerned with Type I error. The level of significance that was allowed was .05. The level of significance being at the .05 level should be sufficient to determine that the differences are real differences and not chance occurrences.

PRECAUTIONS TAKEN FOR ACCURACY

Each phase of organizing and collecting the data was double checked to insure accuracy. The testing of all nine hypotheses was conducted by means of the computer at Montana State University.

SUMMARY OF THE CHAPTER

This chapter has examined the procedures that were undertaken in the investigation of the relationships concerning the hypotheses. It has looked at population and sampling procedures; the categories under investigation; the method of collecting and organizing data; the hypotheses; the analysis of data; and the precautions taken for accuracy.

CHAPTER FOUR

RESULTS

In this chapter each of the hypotheses which the study has set out to test were discussed in order: Hypothesis One, Hypothesis Two, etc. This discussion has included a restatement of the hypotheses, a reference to each appropriate table, and a descriptive statement of the outcome in the testing of the hypotheses. The results included whether or not the data justifies acceptance or rejection of the hypotheses.

HYPOTHESES RESULTS

Hypothesis One

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the twelve months of the year. The alternate hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the twelve months of the year. The results of the Chi Square (χ^2) Test as applied to Hypothesis One are indicated in Appendix B, Table 1. The results of the Chi Square Test indicate that there isn't any significant relationship between the twelve months of the year and the sex of the caller, the type of the contact and the action taken. The data justifies the acceptance of the null hypothesis. Table 1 also indicates that there was a significant relationship between the twelve months of the year and the type of call. This relationship is significant beyond the .05 level as indicated by $\chi^2=34.361$ and Degrees of Freedom equalling

22. This data justifies the acceptance of the alternate hypothesis.

Hypothesis Two

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the seven days of the week. The alternate hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, the action taken and the seven days of the week. Table 2, Appendix B, indicates that there wasn't any significant relationship shown between the days of the week and the sex of the caller, the type of contact, the type of call and the action taken. This implies that the data justifies acceptance of the null hypothesis.

Hypothesis Three

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, the action taken and the hours of the day which were divided into six segments of four hours each. The alternate hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the hours of the day. Table 3, Appendix B, shows no statistical significance at the .05 level for the time of the day in relation to the type of contact. This shows acceptance for the null hypothesis. The table has shown a statistical significance at the .05 level for the relationship of the

time of the day as to sex of the caller, type of the call and action taken. This significance is shown as: sex ($\chi^2=18.822$ and Degrees of Freedom=5); the type of call ($\chi^2=33.148$ and Degrees of Freedom=10); and the action taken ($\chi^2=19.592$ and Degrees of Freedom=5). This justifies acceptance of the alternate hypothesis.

Hypothesis Four

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the five visibility segments. The alternate hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the five visibility segments. The Chi Square Test found visibility in relation to sex, contact, and action taken statistically significant at the .05 level. This indicates acceptance of the alternate hypothesis. Table 4, Appendix B, shows this significance as: sex ($\chi^2=16.873$ and Degrees of Freedom=3); type of contact ($\chi^2=18.010$ and Degrees of Freedom=3). Table 4 also shows that there was no significant relationship found between visibility and the type of call. This implies acceptance of the null hypothesis.

Hypothesis Five

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the four levels of sea level pressure. The alternate

hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the sea level pressure. Chi Square Test in Table 5, Appendix B, reveals no significant relationship found in sea level pressure in regard to the sex of the caller, the type of contact, the type of call and the action taken. This justifies acceptance of the null hypothesis.

Hypothesis Six

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the five temperature groups. The alternate hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the temperature. Table 6, Appendix B, shows no significant relationship found for temperature in relation to type of contact, type of call, or action taken. This implies acceptance of the null hypothesis. However, the Chi Square Test as applied to this hypothesis provides a statistical significance in the relationship of: temperature and sex ($\chi^2=11.591$ and Degrees of Freedom=4) at the .05 level. This provides acceptance of the alternate hypothesis.

Hypothesis Seven

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the nine divisions of wind direction. The alternate

hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the wind direction. Table 7, Appendix B, shows no statistical relationship for wind direction as to sex, contact, type of call, and action taken. This denotes acceptance of the null hypothesis.

Hypothesis Eight

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the three categories of wind speed. The alternate hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, action taken and wind speed. In Table 8, Appendix B, the wind speed was shown not to be significant in relation to the type of call and the action taken. Although, wind speed was shown to be significant in relation to the sex of the caller ($\chi^2=10.489$ and Degrees of Freedom=2) and the type of contact ($\chi^2=7.210$ and Degrees of Freedom=2) at the .05 level. This provides acceptance of the null hypothesis in regard to the type of call and action taken; but acceptance for the alternate hypothesis in relation to the sex of the caller and the type of contact.

Hypothesis Nine

The null hypothesis is that there is no significant relationship between the sex of the caller, the type of contact, the type of call, action taken and the three levels of barometric pressure. The

alternate hypothesis is that there is a significant relationship between the sex of the caller, the type of contact, the type of call, action taken and barometric pressure. Table 9, Appendix B, indicates an acceptance of the null hypothesis in that there was no statistical significant relationship found between barometric pressure and sex, contact, type of call or action taken.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

The findings in this study are as follows:

Sex

Male callers were found to have their highest percentage of calls in hours of 8:00 p.m. to 8:00 a.m. As the visibility increased, from 0 - 15 miles, the tendency of male calls is to increase until visibility reaches 15 to 30 miles then they tend to decrease. Men were found to have a higher percentage of calls when the temperature was 54° and below. As wind speed increases, the percentage of male calls decreases. Male calls constituted a percentage of 33.3 of the total number of calls.

Female callers were found to have their highest percentage of calls in hours of 8:00 a.m. to 8:00 p.m. Females' percentage of calls decreased as visibility went from 0 - 15 miles. At 15 miles and above, the tendency was to increase. Women generally called at the higher temperatures of 54° and above. As wind speed increased, percentage of female calls increased. Female calls constituted 66.7 percent of the total number of calls.

Type of Contact

Telephone calls were highest in percentage in the 10 - 30 mile range of visibility. The number of phone calls tends to decrease as the wind speed decreases. The total number of telephone calls was 81.5 percent of the total contacts.

Walk-ins increase in percentage as visibility decreases.

it is highest in the 0 - 10 mile visibility. The number of walk-ins tend to increase as wind speeds increase. The total number of walk-ins equal 18.5 percent of all contacts.

Type of Call

Depression is highest in percentage during the months of June, July, August, September and October. It's highest days are Monday, Wednesday and Friday. It has a tendency to occur most often in the hours 8:00 a.m. to 8:00 p.m. In percentage to suicide contemplated and suicide attempted, it constitutes 84.5 percent of the total number of calls. When visibility is under five miles and above 15 miles it has it highest percentage of occurrence.

Suicide contemplated has its highest percentage of occurrence in the months of November, December, January and February. It's most likely to occur in the hours of 8:00 p.m. to 8:00 a.m. Its highest percentages are when visibility is 10 miles and below. Suicide contemplated constituted 11 percent of the total number of calls.

Suicide attempted has its peak during March, April and May. It occurs most often 8:00 p.m. to 8:00 a.m. and is highest when visibility is 10 miles or below. It constitutes 4.5 percent of the total calls.

Action Taken

Not referred calls had a higher frequency of occurrence from 12:00 p.m. to 1:00 a.m. and was more common when visibility tended to decrease. Percentage of total calls which were not referred equals

60.4 percent.

Referrals had the highest percentage of occurrence during the hours of 1:00 a.m. to 12:00 p.m. The number of referrals increased with the visibility. The percentage of referrals was 39.6 percent of the total number of calls.

Totals

January was the lowest month with 62 calls. May was the highest month with 100 calls. The lowest day was Sunday with 112 calls. The highest day was Friday with 161 calls. The lowest time of day was 4:00 a.m. to 8:00 a.m. with the total of 21 calls. The highest time of day was 8:00 p.m. to 1:00 a.m. with 352 calls. Visibility had 60.1 percent or 586 calls out of 974 calls occur under five miles. Sea level pressure had 63.3 percent of its calls occur within 100 mbs (millibars) of its average which was 165 millibars. Temperature had 65.6 percent of its calls occur within 20° of its average which is 45° . In Table 7 the totals show that the greatest number of calls occur when the wind is blowing in the direction of South to East. A large number of calls occurred in which there was no wind blowing. This number constituted 174 or 18.2 percent of the total number of calls. Concerning wind speed 86.7 percent or 845 calls occurred when the wind speed was under 10 miles per hour. In barometric pressure 62.8 percent of the calls were within .100 ins. of the average which was 25.45 ins.

This study indicates that there are certain months of the year in which the incidence of depression, suicide contemplated, and suicide attempted calls are more frequent than in other months. The totals show that there are certain days in which there is a greater prevalence of calls than others. The implication of this study is that there are certain characteristics which would be beneficial in the diagnosis, the planning, the training and the treatment of depressive and suicide related crisis calls. In this study it has been shown that about 60 percent of all the calls occur when visibility is under five miles. This indicates either stormy, cloudy weather or night. The data has shown that the largest percentage of calls occurs after 4:00 p.m. to 4:00 a.m. It has been shown that women are more likely to take advantage of the crisis center's intervention. They are more apt to use the telephone, to call because of depression, and to accept a referral. It is more probable that women would contact a crisis center during the day, when the temperature is higher, and at times when the wind speed is increased. Males are more likely to call at night when temperatures are lower, and at a time when wind speed has decreased. Men seem to call at a time in which suicide contemplation or attempt are found most frequent. They walk-in more often than women and are less likely to be referred.

In most cases the data turned out as expected except in the case of sea level pressure and barometric pressure. The measurement

used was inadequate in that inches and millibars have no standard measurement to indicate either high or low pressure. Therefore, no conclusions could be made pertaining to sea level or barometric pressure.

The findings of this study have shown a relationship to the findings as shown in previous studies found in the review of literature. The study of Mills (1939) concerning storm patterns and suicide and Landsberg's (1969) study of weather phases correspond to this study. Mills described a high incidence of suicide following storm fronts. Landsberg found a high probability of suicide in weather phase 4. Weather phase 4 is the phase of the storm. It is characterized by extreme cloudiness, strong winds, winds blowing south to southeast and temperature higher than average.

Weather phase 3 is the time in which the storm has ended. It is seen as a time of lowering wind speed, lowering of temperature and more sunlight. This study indicated that women would be most apt to use the crisis center during weather phase 4--low visibility, higher temperature, and increased wind speed. Men, it seems, would be using the center during weather phase 3--wind blowing southeast to east, lower temperatures and decreased wind speed. Weather phase 3 is the period after the storm and is shown by Mills to be a time of high suicide probability.

This study corresponds with the findings of Dublin (1963)

concerning the suicide peak and the month of May. The high number of female calls in relation to male calls may relate to Kiev's (1974) findings indicating that female sex hormone levels are related to depression. The temperature change which occurs in weather phase 4 relating to females may correspond to the effects which Tromp (1963) suggested concerning the effects of weather on hormonal secretion. The review of the literature concerning crisis centers discussed training, treatment, prevention, and follow-up. The data in this study has shown the need for a crisis center in that 80.8 percent (787 calls) of the 974 calls were received in hours during which no other agency is regularly open. However, the data has also shown that of all the calls received only 39.6 percent (385 calls) were referred. The review of literature stressed the need of the referral. In this study, the number of calls referred indicates that there is a need for more emphasis to be put on referrals.

RECOMMENDATIONS

One of the implications of this study is that the crisis center staff which plans their training schedule appropriately will have the maximum opportunity for effective crisis intervention. This planning would be benefited by a knowledge of those characteristics and trends which have been shown in this study. There is a need for the professional community to recognize the vital role that the crisis center plays in the intervention of depression and suicide cases. Closer

cooperation among community resources and crisis intervention centers is encouraged. This would include greater community integration in the matter of awareness, prevention, referrals and follow-up.

Some suggestions for additional research are:

1. More research concerning the actual effect that weather has in inducing depression and suicide.
2. The development of an accurate measurement which would indicate high and low pressure for barometric and sea level pressure.
3. The reasons why more women than men contact the crisis center.
4. Why calls are referred more often during some periods of the day than others.
5. The reasons why some months have a higher number of suicides than other months.

These are some of the many questions raised as a result of this study. There is yet much work to be done concerning the question of weather in relation to the incidence of depression and suicide.

APPENDICES

APPENDIX A

BOZEMAN HELP CENTER CASE CARD

Date _____ Phone _____ Walk-in _____ Outreach _____ CB Radio _____
 Yr. Mo. Day

Military Time _____ Length of Call _____ Drug Related _____

Referral Made YES _____ NO _____ Identification No. _____ Age Group _____

Sex F _____ M _____ Gallatin County _____ Other _____

MARK ALL THAT APPLY: Mark boxes, numerically. Indicate which applies most by 1, then others 2, 3, etc.

- | | |
|-------------------------------|-----------------------------|
| 1. Emotional Problem _____ | 15. Venereal Disease _____ |
| 2. Marital _____ | 16. Problem Preg. _____ |
| 3. Drugs _____ | 17. Single Parent _____ |
| 4. Alcoholism _____ | 18. Sexual Problem _____ |
| 4a. (Kids Exp.) _____ | 19. Housing _____ |
| 5. Parent-Child _____ | 20. Transient _____ |
| 6. School _____ | 21. Legal _____ |
| 7. Runaway _____ | 22. Employment _____ |
| 8. Relationship Problem _____ | 23. Financial _____ |
| 9. Suicide (attempt) _____ | 24. Food _____ |
| 9a. (Contemplating) _____ | 25. Traffic Emergency _____ |
| 10. Depression _____ | 26. Information _____ |
| 11. Loneliness _____ | 27. Other _____ |
| 11a Telecare _____ | 28. Hoax _____ |
| 12. Medical _____ | |
| 13. Contraception _____ | |
| 14. Rape _____ | |

MAJOR PROBLEM AREA _____ REPEAT _____

(on back of card the following)

FULL DESCRIPTION OF CALL AND HOW IT WAS HANDLED:

TO WHOM WAS REFERRAL MADE?

SIGNATURE _____

APPENDIX B

TABLE 1

Distribution of the MONTH as to sex, contact

	SEX		CONTACT	
	Male	Female	Tel	Walk-in
Jan	No. 18 % 29.0	44 71.0	50 80.6	12 19.4
Feb	No. 27 % 35.1	50 64.9	63 81.8	14 18.2
Mar	No. 35 % 44.9	43 55.1	62 79.5	16 20.5
Apr	No. 31 % 38.8	49 61.2	62 77.5	18 22.5
May	No. 32 % 32.0	68 68.0	77 77.0	23 23.0
June	No. 19 % 22.6	65 77.4	69 82.1	15 17.9
July	No. 21 % 29.2	51 70.8	57 79.2	15 20.8
Aug	No. 33 % 35.9	59 64.1	76 82.6	16 17.4
Sept	No. 25 % 28.1	64 71.9	75 84.3	14 15.7
Oct	No. 27 % 36.5	47 63.5	62 83.8	12 16.2
Nov	No. 24 % 33.3	48 66.7	62 86.1	10 13.9
Dec	No. 33 % 35.1	61 64.9	78 83.0	16 17.0
Total	No. 325 % 33.3	649 66.7	793 81.4	181 18.5
	$\chi^2=13.155$ DF=11		$\chi^2=4.63$ DF=11	

TABLE 1 (Con't)

type of call, action taken, total no. of calls

	TYPE OF CALL			ACTION		
	Dep	Suc.C.	Suc.A.	Not n.	Ref	Total
Jan	No. 50	4	8	32	30	62
	% 80.6	6.5	12.9	51.6	48.4	6.4
Feb	No. 65	6	6	48	29	77
	% 84.4	7.8	7.8	62.3	37.7	7.9
Mar	No. 60	2	16	44	34	78
	% 76.9	2.6	20.5	56.4	43.6	8.0
Apr	No. 65	2	13	51	29	80
	% 81.2	2.5	16.3	63.8	36.2	8.2
May	No. 81	4	15	59	41	100
	% 81.0	4.0	15.0	59.0	41.0	10.3
June	No. 74	3	7	52	32	84
	% 88.1	3.6	8.3	61.9	38.1	8.6
July	No. 60	5	7	54	18	72
	% 83.3	7.0	9.7	75.0	25.0	7.4
Aug	No. 86	3	3	58	34	92
	% 93.5	3.25	3.25	63.0	37.0	9.4
Sept	No. 82	1	6	59	30	89
	% 92.2	1.1	6.7	66.3	33.7	9.1
Oct	No. 66	3	5	39	35	74
	% 89.2	4.0	6.8	52.7	47.3	7.6
Nov	No. 61	5	6	39	33	72
	% 84.7	7.0	8.3	54.2	45.8	7.4
Dec	No. 74	4	16	54	40	94
	% 78.7	4.3	17.0	57.5	42.5	9.7
Total	No. 824	108	42	589	385	974
	% 84.5	11.0	4.5	60.4	39.6	

$$\chi^2 = 34.361 \quad DF=22^*$$

$$\chi^2 = 14.507 \quad DF=11$$

* Significant beyond .05 level

TABLE 2

Distribution of the DAY OF THE WEEK as to sex, contact,

	SEX		CONTACT		
		Male	Female	Tel	Walk-in
Sun	No.	45	67	91	21
	%	40.2	59.8	81.2	18.8
Mon	No.	50	99	120	29
	%	33.6	66.4	80.5	19.5
Tues	No.	40	75	96	19
	%	34.8	65.2	83.5	16.5
Wed	No.	55	103	129	29
	%	34.8	65.2	81.6	18.4
Thurs	No.	46	90	106	30
	%	33.8	66.2	77.9	22.1
Fri	No.	48	113	132	29
	%	29.8	70.2	82.0	18.0
Sat	No.	40	102	119	23
	%	28.2	71.8	83.8	16.2
Total	No.	325	649	793	181
	%	33.3	66.7	81.5	18.5
		$\chi^2=5.247$	DF=6	$\chi^2= 2.064$	DF=6

TABLE 2 (Con't)

type of call, action taken and total no. of calls

		TYPE OF CALL			ACTION		Total
		Dep.	Suc.C.	Suc.a.	Not R.	Ref.	
Sun	No.	88	14	10	68	44	112
	%	78.6	12.5	8.9	60.7	39.3	11.5
Mon	No.	129	15	5	87	62	149
	%	86.6	10.1	3.3	58.3	41.7	15.3
Tues	No.	101	10	4	65	50	115
	%	87.8	8.7	3.5	56.5	43.5	11.8
Wed	No.	134	16	8	99	59	158
	%	84.8	10.1	5.1	62.7	37.3	16.2
Thurs	No.	107	23	6	75	61	136
	%	78.7	16.9	4.4	55.2	44.8	14.0
Fri	No.	141	17	3	102	59	161
	%	87.6	10.5	1.9	63.4	36.6	16.5
Sat	No.	123	13	6	92	50	142
	%	86.6	9.2	4.2	64.8	35.2	14.6
Total	No.	824	108	42	589	385	974
	%	84.5	11.0	4.5	60.4	39.6	
		$\chi^2=15.712$ DF=12			$\chi^2=4.617$ DF=6		

TABLE 3

Distribution of the TIME OF THE DAY as to sex, contact

	SEX		CONTACT	
	Male	Female	Tel	Walk-in
1 a.m.- 4 a.m.	No. 43 % 36.1	76 63.9	101 84.9	18 15.1
4 a.m.- 8 a.m.	No. 9 % 42.8	12 57.2	18 85.7	3 14.3
8 a.m.-12 p.m.	No. 24 % 24.7	75 75.3	85 87.6	12 12.4
12 p.m.-4 p.m.	No. 46 % 26.3	129 73.7	134 76.6	41 23.4
4 p.m.-8 p.m.	No. 60 % 28.5	150 71.5	162 77.1	48 22.9
8 p.m.-1 a.m.	No. 142 % 40.3	210 59.7	293 83.2	59 16.8
Total	No. 325 % 33.3	649 66.7	793 81.5	181 18.5
$\chi^2=18.822$		DF=5*	$\chi^2=9.693$ DF=5	

*Significant beyond .05 level

TABLE 3 (con't)

type of call, action taken, total no. of calls.

	TYPE OF CALL			ACTION		Total
	Dep	Suc. C.	Suc.A.	Not Ref.	Ref.	
1 a.m.-4 a.m.	No. 95	18	6	74	45	119
	% 79.8	15.1	5.5	62.2	37.8	12.2
4 a.m.-8 a.m.	No. 11	8	2	9	12	21
	% 52.4	30.0	9.6	42.9	57.1	2.1
8 a.m.-12 p.m.	No. 88	6	3	45	52	97
	% 90.7	6.2	3.1	46.4	53.6	9.8
12 a.m.-4 p.m.	No. 156	15	4	103	72	175
	% 89.1	8.6	2.3	58.9	41.1	18.0
4 p.m.-8 p.m.	No. 188	15	7	120	90	210
	% 89.5	7.2	3.3	57.1	42.9	21.5
8 p.m.--1 a.m.	No. 286	46	20	238	14	352
	% 81.2	13.1	5.7	67.6	32.4	36.4
total	No. 824	108	42	589	385	974
	% 84.5	11.0	4.5	60.4	39.6	

$$\chi^2 = 33.148 \quad DF = 10^*$$

$$\chi^2 = 19.592 \quad DF = 5^*$$

*Significant beyond .05 level

TABLE 4

Distribution of VISIBILITY as to sex, contact

SEX				CONTACT	
		Male	Female	Tel	Walk-in
0-5 miles	No.	202	384	455	131
	%	34.5	65.5	77.6	22.4
5-10 miles	No.	22	29	42	9
	%	43.1	56.9	82.4	17.6
10-15 miles	No.	63	96	146	13
	%	39.6	60.4	91.8	8.2
15-30 miles	No.	38	140	150	28
	%	21.3	78.7	84.3	15.7
total	No.	325	649	793	181
	%	33.3	66.7	81.5	18.5

$$\chi^2 = 16.873 \quad DF = 3^*$$

$$\chi^2 = 22.383 \quad DF = 3^*$$

*Significant beyond .05 level *Significant beyond .05

TABLE 4 (Con't)

action taken, type of call and total no. of calls

	TYPE OF CALL			ACTION		Total
	Dep	Suc.C.	Suc.A.	Not Ref	Ref.	
0-5 miles	No. 496	60	30	382	204	586
	% 84.6	10.2	5.2	65.2	34.8	60.1
5-10 miles	No. 39	11	1	30	21	51
	% 76.4	21.5	2.1	58.8	41.2	5.2
10-15 miles	No. 131	20	8	92	67	159
	% 82.4	12.6	5.2	57.9	42.1	16.3
15-30 miles	No. 158	17	3	85	93	178
	% 88.8	9.6	1.6	47.8	52.2	18.4
total	No. 824	108	42	589	385	974
	% 84.5	11.0	4.5	60.4	39.6	

$$\chi^2 = 10.701 \quad DF=6$$

$$\chi^2 = 18.010 \quad DF=3^*$$

*Significant beyond .05 level

TABLE 5

Distribution of the SEA LEVEL as to sex, contact,

	SEX		CONTACT	
	Male	Female	Tel	Walk-in
0-100 mbs	No. 62	122	148	36
	% 33.6	66.4	80.4	19.6
101-165 mbs	No. 99	213	252	60
	% 31.7	68.3	80.7	19.3
166-251 mbs	No. 99	206	252	53
	% 32.4	67.6	82.6	17.4
252-999 mbs	No. 65	108	141	32
	% 37.5	62.5	81.5	18.5
total	No. 325	649	793	181
	% 33.3	66.7	81.5	18.5
	$\chi^2=1.873$ DF=3		$\chi^2=.497$ DF=3	

mbs = millibars

TABLE 5 (con't)

type of call, action taken and total no. of calls

	TYPE OF CALL			ACTION		Total
	Dep	Suc.C.	Suc.A.	Not Ref.	Ref.	
0-100 mbs	No. 156	18	10	114	70	184
	% 84.7	9.7	5.6	61.9	38.1	18.8
101-165 mbs	No. 266	33	13	198	114	312
	% 85.2	10.5	4.3	63.4	36.6	32.0
166-251 mbs	No. 267	30	8	183	122	305
	% 87.5	9.8	2.7	60.0	40.0	31.3
252-999 mbs	No. 135	27	11	94	79	173
	% 78.0	15.6	6.4	54.3	45.7	17.9
total	No. 824	108	42	589	385	974
	% 84.5	11.0	4.5	60.4	39.6	
	$\chi^2 = 9.434$ DF=6			$\chi^2 = 4.090$ DF=3		

TABLE 6

Distribution of the TEMPERATURE as to sex, contact,

	SEX		CONTACT	
	Male	Female	Tel	Walk-in
24°-Below	No. 51	93	122	22
	% 35.4	64.6	84.7	15.3
25°- 34°	No. 66	99	131	34
	% 40.0	60.0	79.4	20.6
35°- 54°	No. 122	219	275	66
	% 35.8	64.2	80.6	19.4
55°- 64°	No. 33	101	117	17
	% 24.6	75.4	87.3	12.7
65°-Above	No. 53	137	148	42
	% 27.9	72.1	77.9	21.1
total	No. 325	649	793	181
	% 33.3	66.7	81.5	18.5
$\chi^2=11.591$ DF=4*			$\chi^2=6.257$ DF=4	

*Significant beyond .05 level

TABLE 6 (con't)

type of call, action taken, and total no. of calls

	TYPE OF CALL			ACTION		
	Dep	Suc.C.	Suc.A.	Not Ref.	Ref.	Total
24°-Below	No. 114	22	8	80	64	144
	% 79.1	15.9	5.0	55.5	44.5	14.7
25°- 34°	No. 142	17	6	97	68	165
	% 86.1	10.3	3.6	58.8	41.2	16.9
35°- 54°	No. 280	43	18	199	142	341
	% 82.1	12.6	5.3	58.4	41.6	35.0
55°- 64°	No. 118	11	5	84	50	134
	% 88.1	8.2	3.7	62.7	37.3	13.7
65°-Above	No. 170	15	5	129	61	190
	% 89.5	7.9	2.6	67.9	32.1	19.7
total	No. 824	108	42	589	385	974
	% 84.5	11.0	4.5	60.4	39.6	
$\chi^2=10.128$ DF=8			$\chi^2=6.944$ DF=4			

TABLE 7

Distribution of the WIND DIRECTION as to sex, contact,

		SEX		CONTACT	
		Male	Female	Tel	Walk-in
N-Nw 0-45	No.	23	53	59	17
	%	30.2	69.8	77.6	22.4
NW-W 45-90	No.	29	76	85	20
	%	27.6	72.4	81.0	19.0
W-SW 90-135	No.	39	82	92	29
	%	32.2	67.8	76.0	24.0
SW-S 135-180	No.	27	61	67	21
	%	30.6	69.4	76.1	23.9
S-SE 180-225	No.	66	101	138	29
	%	39.5	60.5	82.6	17.4
SE-E 225-270	No.	53	97	126	24
	%	35.3	64.7	84.0	16.0
E-NE 270-315	No.	16	40	48	8
	%	28.5	71.5	85.7	14.3
NE-N 315-360	No.	9	28	32	5
	%	24.0	76.0	87.0	13.0
No Wind	No.	63	111	146	28
	%	36.2	63.8	83.9	16.1
Total	No.	325	649	793	181
	%	33.3	66.7	81.5	18.5
		$\chi^2=7.840$ DF=8		$\chi^2=12.311$ DF=8	

TABLE 7 (con't)

type of call, action taken and total no. of calls

		TYPE OF CALL			ACTION		
		Dep	Suc.C.	Suc.A.	Not Ref.	Ref.	Total
N-NW	0-45	No. 67	8	1	47	29	76
		% 88.1	10.5	1.4	61.8	38.2	7.8
NW-W	45-90	No. 85	15	5	65	40	105
		% 80.9	14.2	4.9	61.9	38.1	10.7
W-SW	90-135	No. 108	8	5	72	49	121
		% 89.2	6.6	4.2	59.5	40.5	12.4
SW-S	135-180	No. 77	8	3	44	44	88
		% 87.5	9.0	3.3	50.0	50.0	9.0
S-SE	180-225	No. 141	20	6	99	68	167
		% 84.4	11.9	3.7	59.2	40.8	17.1
SE-E	225-270	No. 124	20	6	98	52	150
		% 83.0	13.0	4.0	65.3	34.7	15.4
E-NE	270-315	No. 49	5	2	40	16	56
		% 87.5	8.9	3.6	71.4	28.6	5.7
NE-N	315-360	No. 35	0	2	22	15	37
		% 95.0	0	5.0	59.4	40.6	3.7
No Wind		No. 139	24	11	102	72	174
		% 79.8	13.7	6.5	58.6	41.3	18.2
TOTAL		No. 824	108	42	589	385	974
		% 84.5	11.0	4.5	60.4	39.6	
		$\chi^2=15.67$			$\chi^2=8.068$		
		DF=16			DF=8		

TABLE 8

Distribution of the WIND SPEED as to sex, contact,

	SEX		CONTACT	
	Male	Female	Tel	Walk-in
0-55 kph	No. 162	290	381	71
	% 35.8	64.2	84.2	15.8
6-10 kph	No. 136	257	304	89
	% 34.6	65.4	77.4	22.6
11-66 kph	No. 27	102	108	21
	% 20.9	79.1	83.7	16.3
Total	No. 325	649	793	181
	% 33.3	66.7	81.5	18.5
$\chi^2=10.489$		DF=2*	$\chi^2=7.210$	DF=2*

*Significant beyond .05 level

kph=knots per hour

TABLE 8 (Con't)

type of call, action taken, and total number of calls

		TYPE OF CALL			ACTION		Total
		Dep	Suc.C.	Suc.A.	Not Ref.	Ref.	
0-5.5 kph	No.	383	48	20	273	179	452
	%	84.7	10.6	4.7	60.3	39.7	46.4
6-10 kph	No.	338	42	13	247	146	393
	%	86.0	10.7	3.3	62.8	37.2	40.3
11-66 kph	No.	103	18	8	69	60	129
	%	79.8	14.0	6.2	53.5	46.5	13.2
Total	No.	824	108	42	589	385	974
	%	84.5	11.0	4.5	60.4	39.6	
		$\chi^2 = 3.559$			$\chi^2 = 3.562$		DF=4

kph=knots per hour

TABLE 9

Distribution of the BAROMETRIC PRESSURE as to sex, contact,

		SEX		CONTACT	
		Male	Female	Tel	Walk-in
25.020 ins.	No.	42	87	107	22
to	%	32.0	68.0	83.5	16.5
25.300 ins.					
25.301 ins.	No.	201	411	494	118
to	%	32.8	67.2	80.7	19.3
25.600 ins.					
25.601 ins.	No.	82	151	192	41
to	%	35.1	64.9	82.4	17.6
25.905 ins.					
Total	No.	325	649	793	181
	%	33.3	66.7	81.5	18.5
		$\chi^2 = .5262$ DF=2		$\chi^2 = .7459$ DF=2	

ins.=inches (measured in inches)

TABLE 9 (con't)

Type of call, action taken and total no. of calls

		TYPE OF CALL			ACTION		Total
		Dep	Suc.C.	Suc.A.	Not Ref.	Ref.	
25.020 ins.	No.	106	15	8	75	54	129
to	%	82.0	11.7	6.3	58.5	41.5	13.1
25.300 ins.							
25.301 ins.	No.	526	64	22	379	233	612
to	%	85.9	10.4	3.7	61.9	38.1	62.8
25.600 ins.							
25.601 ins.	No.	192	29	12	135	98	233
to	%	82.4	12.4	5.2	57.9	42.1	24.1
25.905 ins.							
Total	No.	824	108	42	589	385	974
	%	84.5	11.0	4.5	60.4	39.6	
		$\chi^2=3.238$			$\chi^2=1.355$		DF=2
		DF=4					

REFERENCES CITED

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- Achte', K. A., "Somatic Symptom in Depression," Depression in Everyday Practice, Baltimore: Williams and Wilkins, Co., 1974, p. 285.
- Ayd, Frank, Recognizing the Depressed Patients, New York: Grune and Stratton, 1961, pp. 285-291.
- Beck, Aaron T., The Diagnosis and Management of Depression, Philadelphia: University of Pennsylvania Press, 1973, p. 1.
- Brussel, James A., and Irwin, Theodore, Understanding and Overcoming Depression, New York: Hawthorn Books, Inc., 1973, p. 32.
- Cammer, Leonard, M.D., Up From Depression, New York: Simon and Schuster, 1969, pp. 16, 26, 58-63.
- Coleman, James C., Abnormal Psychology and Modern Life, Illinois: Scott, Foresman and Company, 1972, p. 351.
- Crory, William, "Depression", American Journal of Nursing, 1973, pp. 472-475.
- Davidson, Wesley R., Crisis Intervention With Depressive and Suicidal Clients, Unpublished manuscript, 1972, Available from the Bozeman Help Center, Bozeman, Montana.
- Dublin, Louis I., Suicide, New York: The Ronald Press Company, 1963, pp. 56-58.
- Farberow, Norman L., Concepts and Conceptions of Suicide Prevention Services, California: University of Southern California, 1965, p. 3.
- Fisher, Sheila A. Phd, Suicide and Crisis Intervention, New York: Springer Publishing Company, Inc., 1973, pp. 36-37.
- Freeman, Lucy, The Cry For Love, Toronto: The MacMillan Company, 1969, p. 15.
- Health Information Services, Depression, Dark Night of the Soul, West Point, Pennsylvania: Merck Sharp and Dohme, 1976, pp. 4-5.
- Holme, Richard, Abnormal Psychology, 1972, p. 300.

- Jacobs, Beth, Counselor Training: Short-Term Client Systems
(NTC 03-003) Virginia: National Drug Abuse Training Center,
1968, p. 13.
- Kiev, Ari, Somatic Manifestations of Depressive Disorders, New
York: American Elsevier Publishing Company, Inc., 1974,
p. 8.
- Kline, Nathan S., From Sad To Glad, New York: G. P. Putnam's
Sons, 1974, p. 24.
- Landsberg, Helmet E., Weather and Health, New York: Doubleday
and Company, Inc., 1969, pp. 90-98.
- Lester, Gene and Lester, David, Suicide, the Gamble with Death,
New Jersey: Prentice-Hall, Inc., 1971, pp. 46, 137-138.
- McGee, Richard K., Ph.d., Crisis Intervention in the Community,
Maryland: University Park Press, 1974, pp. 200-207.
- Merskey, H. and Lawton-Tonge, W. Psychotic Illness, London:
Bailliere, Tindall and Cox, 1965, p. 175.
- Mills, Clarence A., Medical Climatology, Maryland: Charles C.
Thomas Publisher, 1939, pp. 176-184.
- Motto, Jerome A., University Bulletin, University of California,
1969, p. 17.
- Motto, Jerome A.; Brooks, Richard M.; Ross, Charlotte P.; Allen,
Nancy H., Suicide Prevention Crisis Centers, New York:
Behavioral Publications, 1974, pp. 19-20.
- Payhel, Eugene S., and Dienelt, M. N., Journal of Nervous and
Mental Disease, 1971, (Oct) Vol 153(4), pp. 227-233.
- Peterson, William F., M.D., Man, Weather, Sun, Illinois: Charles
C. Thomas, Publisher, 1947, p. 187.
- Popkin, M. K.; Stillner, V.; Osborn, L. W.; Pierce, C. M.;
Churley, J. T., "Novel Behaviors in an Extreme Environment,"
The American Journal of Psychiatry, June, 1974, pp. 651-654.
- Resnik, H. L. P., M.D., and Hathorne, Berkley, Th. D., M.P.H.,
Suicide Prevention in the 70's, Washington, D. C.: U. S.
Government Printing Office, 1973, pp. 93-95.

Schneidman, Edwin S., and Mandelkorn, Philip, How To Prevent Suicide, New York: Public Affairs Committee, Inc., 1968, p. 16.

Stengel, Erwin, Suicide and Attempted Suicide, Great Britian: MacGibbon and Kee, Limited., 1965, pp. 53-54.

Tromp, S. W., Medical Biometeorology, New York: Elsevier Publishing Company, 1963, pp. 267-283.

Tuckman, Bruce W., Conducting Educational Research, New York: Harcourt Brace Jovanovich, Inc., 1972, p. 248.

Watts, C. A. H., Depressive Disorder in the Community, Baltimore: The Williams and Wilkins Co., 1966, pp. 10, 21.

Young, F., "For the Severly Depressed, New Hope", The National Observer, 1971, p. 18.