

A MANITOBA STUDY OF BLOOD PRESSURE  
KNOWLEDGE, BELIEFS AND BEHAVIOUR

By

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Submitted as a Partial Requirement  
for Completion of a  
Master's Degree in Health Education

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BY

SANDRA HAMILTON

A thesis submitted to the Faculty of Graduate Studies of  
the University of Manitoba in partial fulfillment of the requirements  
of the degree of

MASTER OF EDUCATION

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## ABSTRACT

Hypertension is recognized as a powerful precursor to cardiovascular disease (Kannel et al., 1980). Approximately three million Canadians have hypertension, of whom only one-half are aware that they have it, and only one eighth are controlled adequately. This study was a Manitoba baseline survey on a random sample of 1500 Manitobans, 18 years and older, to determine their knowledge, beliefs and practices with respect to hypertension. The data were collected using a mail out questionnaire and were analyzed to determine the possible content, strategies and distribution of health promotion programs for the primary and secondary prevention of hypertension in Manitoba. Questionnaires were returned by 925 (65.5%) of all eligible respondents. Knowledge of the causes and consequences of hypertension was moderate-high; 47% of respondents knew that high blood pressure meant the same as hypertension, 64 and 84% respectively knew that it could cause heart trouble or stroke. Accurate knowledge was higher for the upper income and educational groups and the hypertensive group (n=159), however a high level of misinformation was apparent in all subgroups (age, gender, education, income and hypertension status). The study results supported the need for a health promotion program for blood pressure in Manitoba. The goals of the program should be to enable and support lifestyle change, as well as to increase knowledge and clarify existing false beliefs. To take into account the differences between groups in educational needs and media utilization patterns, a variety of educational and media strategies should be utilized.

## CHAPTER 1

### Introduction

Hypertension is one of the primary risk factors in the development of cardiovascular diseases (CVD) (Nichols et al., 1981). Independently, hypertension can lead to stroke, heart failure, renal failure and blindness. Along with other risk factors such as cigarette smoking and high levels of low density lipoprotein (LDL) cholesterol, it can lead to ischemic heart disease, peripheral arterial disease and sudden death (Herd & Weiss, 1984).

Premature CVD, principally ischemic heart disease and stroke has reached epidemic proportions in industrialized countries (Meyer et al., 1980; Stamler, 1981).

In Canada, in 1981, heart and blood vessel disease (ICD - 390-459) (ICD, 9th Rev., Vol. 1., 1980) claimed the lives of 80,174 individuals. That is, 47% of the total number of Canadian deaths in 1981 were attributable to heart and blood vessel disease while cancer was responsible for 24% of total Canadian deaths in that year (Stats. Can., 1983). Of the heart and blood vessel disease deaths, ischemic heart disease (ICD - 410-444) and cerebrovascular disease or stroke (ICD 430-438) caused more than 60% and 20% of those deaths respectively (Nichols et al., 1981).

It is estimated that over half of the ischemic heart disease deaths in Canada are attributable to the three major risk factors: smoking, hypertension and elevated serum cholesterol (Wigle, 1985). There is a time lag between the presence of the risk factor and the onset of the

clinically observed signs or symptoms. Blood pressure and serum cholesterol are usually elevated for an average of twenty years prior to the onset of the first cardiovascular event, however, the time from cessation from a risk factor until observed clinical changes are apparent is variable. Wigle (1985) states that hypertension and LDL cholesterol control may yield detectable reductions in ischemic heart disease events in less than five years.

Mortality rates from ischemic heart disease for Canadian men aged 25-54 increased until the mid 1960's (386 per 100,000 per year) and then decreased. The 1977 rate was 305.5 deaths per 100,000 per year, which is about 22% lower than the 1968 levels. Rates for Canadian women, 25 years and over had followed a similar trend falling from 182.1 deaths per 100,000 in the mid 1960's to 136.2 deaths per 100,000 per year in 1977 (Nichols et al., 1981).

The age-adjusted mortality rates for cerebrovascular disease (stroke) for men in Canada ages 25 and over, declined from 107.4 per 100,000 per year in 1953 to 68.2 per 100,000 in 1977. The rates for women ages 25 and over declined from 112.8 per 100,000 in 1953 to 44.9 per 100,000 in 1977 (Nichols et al., 1981).

As ischemic heart disease places a heavy burden on the country's economy, it is practical to identify the possible causes of the decline in mortality rate. The current situation may be attributable to beneficial changes in lifestyle of the population and reductions in the known major risk factors. The prevalence of cigarette smoking among adults in Canada decreased by 16% between 1965 and 1977 (Smoking Habits of Canadians, Department of National Health and Welfare, 1979).

However, there is still a problem of smoking among teenagers and among women who are smoking cigarettes and using the contraceptive pill. A reduction in the consumption of saturated fats and cholesterol with a shift to substitutes may have led to a drop in serum cholesterol levels in the United States' population (from 235 mg/dl to 220 mg/dl) (See Table 1). There are more people (46%) participating in regular physical activity. An increased proportion of people with hypertension has been detected and are being effectively treated (Moser, 1983). These life-style changes have been made more frequently in the higher educational and income levels and in younger adults (Stamler, 1981).

The cause of ischemic heart disease is multi-factorial and several factors in combination may be responsible for the decline in mortality, including socioeconomic and cultural factors that play a role in exposure to risk factors (Nichols et al., 1981).

TABLE 1

Change in Per Capita Consumption of Various Products, 1963 to 1980\*

<u>Product</u>	<u>Percent change</u>
Cigarette tobacco	-27.1
Fluid milk and cream	-24.1
Butter	-33.3
Eggs	-12.3
Animal fats and oils	-38.8
Vegetable fats and oils	+57.6
Fish	+22.6

\* Figures for calculating change obtained from the U.S. Department of Agriculture. Table adapted from N. Engl J Med 308:650, 1983 (Walker 1983).

The data collected from the Framingham projects and other major studies in the United States suggest that high levels of serum cholesterol, blood pressure and cigarette use were responsible for about two-thirds of the major coronary events among middle-aged American men (Stamler, 1981).

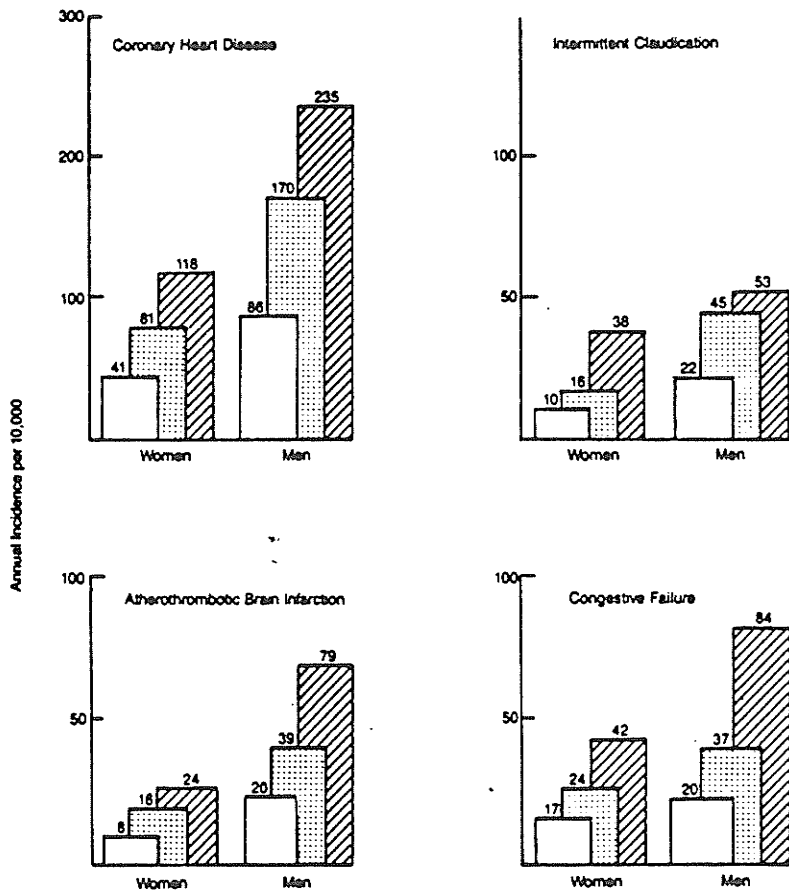
It has become increasingly apparent that the predisposing factors to coronary heart disease (CHD) (ICD - 410-414) are interactive, and risk varies depending on the risk factor makeup (Kannel et al., 1984). Elevated LDL cholesterol, high blood pressure, cigarette smoking and impaired glucose tolerance are personal characteristics that are related to CHD risk. However, none of these characteristics by themselves are strict determinants of disease. The risk associated with any single factor varies with the constellation of other factors present. For example, the risk of cardiovascular diseases due to high blood pressure varies widely depending on the intensity of coexistent risk factors. The probability of a cardiovascular event occurring in the next 8 years for a 45 year old person with an elevated systolic blood pressure (160 mm Hg) is 2.4% for females and 4.3% for males. The probability rises to 6.1% for females and 15.9% for males if the serum cholesterol level is also elevated (335 mg/dl) and to 11.8% and 37.6% if the person smokes and is glucose intolerant (Kannel et al., 1980).

The risk of each of the major cardiovascular diseases (ICD - 390-459) is directly related to hypertension and even mild elevations impose a substantial risk (Iacono, 1984) (See Figure 1). The greatest number of excess deaths attributable to hypertension (ICD - 401) occur in the large subgroup with mild hypertension (Kannel et al., 1984; The

Figure 1

**Age-Adjusted Risk of Cardiovascular Morbidity  
According to Hypertensive Status at Each Biennial Examination**

Twenty-six Year Follow-up: Framingham Cohort, Men and Women Aged 35-84



All trends statistically significant at  $P < .01$

FIGURE 7.

Source: Adapted from The Framingham Study.

Management Committee, 1982). Computations from the British Whitehall Study population showed that about half the excess CHD deaths and one-fourth of the excess stroke deaths occurred in the major portion of the population having diastolic blood pressures of approximately 100 mm Hg. Three-quarters of stroke and two-thirds of CHD deaths occurred in those with blood pressures under 110 mm Hg (Reid et al., 1979).

Hypertension is usually asymptomatic until considerable damage has already occurred. This fact makes it particularly important to convince people that they must be examined regularly for hypertension as the majority of people are accustomed to seeking medical care or altering their life style only during acute illness (U.S. National Institute of Health, 1985).

#### Extent of the Problem

The estimated prevalence of hypertension in the United States in 1981 was approximately 17%. Hypertension was defined as blood pressures of 160 mm Hg. systolic or more or 95 mm Hg. diastolic or more (Herd & Weiss, 1984). Figures are more difficult to obtain in Canada. The Nutrition Canada Survey (Department of National Health & Welfare, 1975) estimated in a population survey that 12.5% of men and 11.2% of women had casual, single reading diastolic blood pressure of 100 mm Hg. or more. A 1978-79 national survey (Report of the Canada Health Survey, 1981) reported that 6.9% of men and 4.8% of women had diastolic pressures of 95 mm Hg. or greater. The Canada Health Survey (1981) states that:

"nearly 200,000 Canadians have blood pressure elevated to such a degree that (additional) treatment would almost certainly be beneficial. An additional 2.6 million persons might benefit from having their blood pressure lowered. Two-thirds of Canadians who have elevated blood pressure are unaware of the fact."



In a comparison of the results of the Canada Health Survey, the Canadian Fitness Survey and the Nutrition Canada Survey, Johansen (1985) concluded that 6 - 13% of the population 20-64 years of age have treated or untreated hypertension. Fifty percent of those with hypertension are not under control and up to six percent of the total population is unaware that their blood pressure is elevated. Twenty-seven to 43% of the population that is 65 years of age and older have treated or untreated hypertension. Forty percent of those with hypertension are under control, and up to 27% of the total population is unaware that their diastolic blood pressure is elevated (95 mm Hg or greater).

The cost implications of hypertension are worth noting. The estimated cost for effective treatment (to reduce high blood pressure to a normal range) for one million Canadians with hypertension could be approximately \$700 million per year (Harvey et al., 1985). In addition to the cost of treatment and hospital admission due to coronary heart disease and stroke, the cost to the individual and society in loss of salary, disability payouts and pension schemes must be considered. The cost associated with the yearly incidence of heart disease in Canada is approximately \$3 billion (Fraser, 1986).

#### Rationale - "Why Programs Are Needed"

Hypertension is a disease which can be treated. Results from six randomized controlled trials provide evidence that antihypertensive drug treatment is effective in reducing morbidity, major cardiovascular events and their subclinical precursors (Smith, 1977, The Management Committee, 1982). There also is increasing evidence that hypertension

is a disease which can be prevented (Report of The WHO Expert Committee on CHD, 1982; Blackburn, 1984; Iacono et al., 1984).

The control and prevention of high blood pressure in populations are central to the prevention of stroke and a major factor in the prevention of CHD (Report of WHO Expert Committee, 1981).

The need to develop high blood pressure control programs in Canada as part of a comprehensive effort to reduce the impact of cardiovascular disease was identified in the Heart-lung Health Report submitted to the Federal/Provincial Deputy Ministers of Health in 1981 by the Advisory Committee on Health Promotion, and by the Ad Hoc Committee on National Health Strategies in its 1982 report (Federal/Provincial Advisory Committee on Community Health Services, 1983). A Canadian Coalition for the Prevention and Control of High Blood Pressure was formed in March, 1985, to co-ordinate a unified approach to the problem of high blood pressure in Canada.

The Canadian Hypertension Society advocates that programs to improve the control of high blood pressure should include the education of the general public (Report of the Workshop on the Status of Hypertension in Canada, 1982).

Public education programs are described as activities to impart general knowledge about blood pressure: its measurement, persons at risk, effects of untreated high blood pressure, underlying risk factors such as obesity, excessive salt intake, alcohol, interaction of risk factors including oral contraceptives and smoking, and measures that can be taken to influence lifestyle and reduce the odds of developing cardiovascular disease (Federal/Provincial Advisory Committee on Community Health Services, 1983).

### Primary Prevention

Primary prevention is defined as a preventive strategy that attempts to create a favourable environment which allows only minimal exhibition of disease (e.g., hypertension and atherosclerosis and the lifestyles associated with them) in susceptible phenotypes in the population, (Blackburn, 1984). The potential for prevention of high blood pressure in populations is illustrated by its total absence in a few isolated subsistence economies where the people are generally physically active, obesity is rare, the sense of community is strong and the salt intake is usually under 3 g daily (WHO Expert Committee, 1982).

Recent studies in the United States and other countries have shown consistently a relationship between increasing salt intake and blood pressure (Freis, 1976). Since the excessive salt (Kagen et al., 1981) intake that is prevalent in North America is due to the heavy use of salt in commercially prepared foods, it should be possible to reduce sodium intake to 70 mmol/day by avoiding salted foods (ham, bacon, canned foods) and by not adding salt to food at the table (Morgan et al., 1978). The Report of Inter-Society Commission for Heart Disease Resources (1984) recommends a sodium intake of 2.0 g/day (4 g/day salt) to reduce blood pressure and help prevent hypertension.

High population levels of LDL cholesterol and total serum cholesterol increase the risk of coronary heart disease (The Lipid Research Clinics Coronary Primary Prevention Trial, 1984). Epidemiological studies have demonstrated that coronary heart disease risk escalates sharply at total serum cholesterol levels above 220 mg/dl. About 75% of excess or attributable CHD deaths occur in the large serum cholesterol

class from 220 - 310 mg/dl. Recent studies also have reported that there is an association between diets that are high in saturated fats and increased blood pressure (Iacono et al., 1984). The relative impact of the dietary factors on risk is intensified by the presence of other coronary risk factors such as high blood pressure (Kannel et al., 1984).

Marked overweight also is associated with high levels of the major risk factors and therefore contributes to the risk of atherosclerotic cardiovascular diseases (Kannel et al., 1984). Obese persons develop twice as much cardiac failure and brain infarction as persons of normal weight according to Gordon et al., (1976). The WHO Expert Committee on the Prevention of CHD (1982) quotes data suggesting that the new occurrence of high blood pressure might be reduced by one quarter in some black populations and by as much as one-half in some white populations through the control and prevention of overweight in the population.

Sustained physical activity has been associated with a reduced cardiovascular mortality and lower rates of fatal coronary attacks (Paffenbarger et al., 1975). Hence, a prudent exercise program may be beneficial as part of a comprehensive risk reduction program.

Coronary risk factors such as elevated blood pressure, serum cholesterol, obesity, impaired glucose tolerance, and cigarette smoking tend to cluster within families, including spouses as well as siblings and offspring (Kannel et al., 1984). Interactive environmental and genetic influences possibly account for such familial associations.

There is much evidence to support the hypothesis that atherosclerosis has its origin in childhood and that it is chiefly a product of a diet too rich in saturated fat and cholesterol (Kannel & Dawber, 1972).

Juvenile population studies have demonstrated a familial tendency towards hypertension. The fact that parent-child blood pressures correlate more closely in families where spouse aggregation also is present supports the theory that both genetic and lifestyle factors interact to increase the risk of hypertension. Essential hypertension begins early in life (Zimmer et. al., 1971) and it is possible that adult hypertension can be predicted from childhood values (Lauer et. al., 1975). As the behaviours that predispose individuals to hypertension and atherosclerosis may be formed in childhood, the optimal time to begin prevention of atherosclerotic disease is early in life. Atherosclerosis prevention is a family concern and parents should be encouraged to set a good example for their children with respect to atherogenic lifestyle. School and community health programs should address the behaviours and life style that may lead to atherosclerosis and its sequelae.

The Inter-Society Commission for the Heart Disease Resources (1970) made the following recommendations for the primary prevention of the atherosclerotic diseases:

- changes in diet to prevent or control hyperlipidemia, obesity, hypertension and diabetes.
- elimination of cigarette smoking.
- pharmacologic control of elevated blood pressure.

Another trend in lifestyle also merits attention. Research in recent years has shown that heavy drinking is associated with higher prevalence rates of hypertension, independent of other traits related to risk of high blood pressure (Kaelber et al., 1981; Stamler, 1981). A population strategy which promotes a palatable diet that is low in salt,

saturated fat, alcohol and cholesterol and an attractive activity pattern as well as detection and treatment of hypertension is recommended for the primary and secondary prevention of hypertension (Blackburn, 1984; WHO Expert Committee, 1982; 1983). While the approach should be aimed at the whole population, there should be special attention given to children and adolescents to inculcate healthy habits from an early age (WHO, 1982). The strategy required must be powerful enough to have general application as well as to meet needs of specific groups such as the lower socioeconomic classes. This approach is intended to reduce multiple risk factors through multiple educational strategies and delivery mechanisms. Direct education, education through the media and community organizations are essential components in the delivery of a health education campaign for primary prevention.

#### Public Education

The behaviour and lifestyle of an individual is now being recognized as one of many determinants of health. There is a trend towards emphasizing individual responsibility and self-help by an active informed participant in health promotion and disease prevention (Federal/Provincial Advisory Committee on Community Health Services, 1983). However, information alone may not change behaviour. It is necessary to make the facts known and to motivate people to act on knowledge gained, as well as to provide accessible health care. Governments and health professionals have a responsibility in providing individuals with the necessary factors for behaviour change.

Due to the immensity of the health problem and the high prevalence

of predisposing factors in the general population, a broad strategy of health promotion approaches is required to achieve cardiovascular disease control (WHO, 1982). Public health action meets resistance when individuals are required to change their current lifestyle without accurate knowledge and perceptions of the health hazard (e.g. seat belts).

The challenge of educating the public is colossal. In a population facing constant social and economic problems, it is difficult to deliver effectively even a simple message promoting health. Therefore, health promotion program planning must be organized systematically on the basis of sound principles and objective data. Public education programs require co-ordinated strategies developed by inter-disciplinary committees.

The working group (Federal/Provincial Advisory Committee, 1983) recommends that Canadian high blood pressure prevention and control programs be based on the following goals:

**Education:** to increase knowledge and action about blood pressure and related risk factors among the public, health professionals and individuals with high blood pressure.

**Surveillance (Screening):** to provide ready access for periodic blood pressure measurement at a variety of sites and to ensure linkage to a source of care.

**Bringing into care:** to ensure detection, evaluation, and initiation of treatment for persons with hypertension.

**Maintaining under care:** to ensure follow-up, recall, and other assistance with compliance for persons with hypertension.

Co-ordination and communication: includes the co-ordinating mechanism and exchanges of information needed to develop and implement programs.

Knowledge development, research and education: includes acquiring the information and data base required for planning, program development and evaluation.

Baseline data and information on current public and professional perceptions and practices are needed by planning committees to facilitate the development of educational strategies in order to meet the goals previously mentioned (Federal/Provincial Advisory Committee on Community Health Services, 1983). Baseline data of the public's knowledge and practises would provide information on the population's knowledge and skill requirements and facilitate segmentation of the population into groups. The analysis of data would also indicate what communication channels would be most expedient in reaching the target groups.

#### Purpose of Study

Evaluation must be an ongoing process in any health education/promotion program. Formative research is necessary to provide data for use in designing educational programs and strategies, to monitor the effects of programs in meeting goals and objectives, and to determine where program changes are necessary to make programs more effective. Baseline data collection is an essential component of evaluation.

Currently in Canada and in particular in Manitoba, there is a lack of data on the population's knowledge, beliefs and reported behavior



with respect to hypertension.

The purpose of this study was to collect data which would segment the Manitoba population according to their hypertension beliefs, knowledge and behaviour. The baseline data will facilitate planning, implementation and evaluation of systematic health education/promotion programs for the primary and secondary prevention of hypertension in Manitoba.

#### Limitations

I. The data were collected by mailed questionnaires. It is important to acknowledge that individuals may have difficulties with complete and accurate recall of facts which, to some extent influence the findings.

II. The accuracy of survey results is in part based upon the level of response rates and the consistency of response rates across different demographic groupings. Low or inconsistent response rates may significantly affect the survey results.

III. Questions have been designed so that respondents could be expected to know the answer. Questions which employed medical terms were avoided as much as possible. As hypertension is a medical condition, it was necessary to include some questions about medical symptoms and related conditions. Although layman's terms were used, some respondents may have not been able to comprehend the terms, for example, poor circulation, nervous condition, stroke, heart disease.

IV. Mail out surveys assume literacy. The readability of the questionnaire is approximately grade 7-8 level which may preclude some

people from completing the questionnaire. This may affect the response rates in some subgroups, for example low education and income groups, and various cultural groups for whom English is a second language.

### Research Hypotheses

The research hypothesis for this study were generated from recent literature that indicates that there are differences between subgroups (gender, age, income, education and hypertension status) in their hypertension beliefs, knowledge and behaviour. It has also been documented that there are variations between subgroups in the population in their utilization patterns of health information sources.

The results of the most recent U.S. national survey of hypertension beliefs, knowledge and behaviour (1979) indicate that people over 65 years of age, or those of lower income or educational level, rely mainly on a doctor for health information. Younger people and those with higher incomes and educational levels rely more on television, newspaper and friends and relatives for health information. This study found also that the majority of people in every subgroup have seen a doctor within the past year.

Kannel et al. (1984) state that individuals with higher incomes or educational levels and younger people (under 35 years) are actually making the required lifestyle modification to reduce the risk of cardiovascular disease more than the other groups in the population. The assumption may then be made that these groups have greater knowledge of high blood pressure, as well. In addition, hypertensives' knowledge of the disease would be higher than non-hypertensives, since hypertensives

have likely had more opportunities to learn about their disease at the time of diagnosis and follow-up.

The beliefs that people hold about their health and health behavior affect what they actually do about it. These beliefs may be about health care (accessibility, benefits of treatment), about the threat of the disease (seriousness, susceptibility), or about the expectations of other people (Dimatteo and Dinocola, 1982). Beliefs about the seriousness of hypertension or susceptibility to it may be increased in individuals who have the disease, or are at a higher risk of developing hypertension (hypertensives, those over 65 years of age, or those with a family history of high blood pressure). These beliefs may be incentives for the recommended behaviour change, particularly in the high risk group.

With respect to the previous discussion, the hypotheses to be tested in this study are as follows:

I. Information sources about health (U.S. NIH, 1985):

(a) A significantly higher proportion of people with high incomes (\$35,000 a year and over) feel that they are able to find out what they need to know about health more than people of lower incomes.

(b) People under 44 years of age rely on newspaper articles, T.V., public service radio messages, relatives and friends for health information significantly more often than the elderly.

(c) In all subgroups (by age, income, education, hypertension status, gender), a significantly higher proportion of people rely on their own doctor or clinic for health information than on other health information sources.

(d) In all subgroups (age, gender, educational level, income and hypertension status), a significantly higher proportion will have visited a doctor or clinic for an appointment within the past 12 months.

## II. Susceptibility:

(a) A significantly higher proportion of people with a family history of hypertension believe that they are more susceptible to developing hypertension than those without a family history of hypertension.

(b) Hypertensives have a family history of heart disease, stroke, kidney disease or hypertension significantly more often than those who are non-hypertensive.

## III. Seriousness of selected diseases:

(a) Hypertensives and the elderly rate hypertension as being serious significantly more often than non-hypertensives and young people (35 years and under).

## IV. Knowledge:

(a) University graduates and those with higher incomes are significantly more likely to know about high blood pressure (its possible causes and consequences, and how to prevent and control it) than those with less education and income.

(b) Hypertensives have significantly greater knowledge regarding hypertension than non-hypertensives.

V. Behaviour:

A significantly greater number of persons with higher incomes (\$35,000 a year and over) or educational levels or under 35 years of age will have attempted to change their lifestyle to improve their health in the last 12 months than their counterpart groups (lower income, lower education, over 35 years of age).

DEFINITIONS

Hypertension Essential hypertension (ICD 401) is defined medically as high blood pressure, meaning abnormally high blood pressure in the arteries which will increase the likelihood of damage to heart and blood vessels (Herd & Weiss, 1984). Both systolic and diastolic values of blood pressure are strong, graded and independent predictors of CHD risk (Kannel et al, 1980). Hypertension describes elevated blood pressure, however there is no obvious point on the measurement scale above which a person is considered hypertensive and at higher risk of stroke and heart disease (Johansen, 1985). There is no universally accepted definition of hypertension, however the definitions below are commonly used (Nichols et al., 1981):

Definite Hypertension - either systolic pressure of 160 mm Hg. or more or diastolic pressure of 95 mm Hg. or more.

Borderline Hypertension - systolic pressure below 160 mm Hg. and diastolic pressure below 95 mm Hg., but not both below 140 mm Hg. systolic and 90 mm Hg. diastolic.

Normotension - both systolic pressure below 140 mm Hg. and diastolic pressure below 90 mm Hg..

Risk Factor The risk factor concept is derived from a variety of epidemiologic evidence on cardiovascular mortality rates in different racial, occupational, and religious subgroups in various countries. The individual and environmental factors epidemiologically linked to cardiovascular disease are designated "risk" factors, or predictors of future disease. The association of the major identified risk factors to cardiovascular disease are considered causal. The implicated traits are considered causally related to the disease because they precede the disease, show a strong relationship to the disease, and the severity of the disease increases as the exposure to the risk increases. The risk factors have been consistently predictive of the disease in other population samples, and are independent of other risk factors. The cause-effect relationship has also been demonstrated by animal experimentation and clinical investigation (Report of the Inter-Society Commission for Heart Disease Resources, 1984).

Ischemic Heart Disease (Coronary Heart Disease - CHD)

Impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by obstructive changes in the coronary circulation to the heart (ICD 410-414) (WHO Expert Committee on CHD, 1982).

International Classification of Diseases (ICD)

The ICD (ninth edition) of the World Health Organization has been used in Canada since 1980 (ICD, 9th Rev., Vol. 1, 1980). The ICDA-9 rubrics for the diagnostic categories studied in this thesis were: cardiovascular disease, 390-459; ischemic heart disease, 410-414; cerebrovascular disease, 430-438; and hypertensive disease, 400-405.

## Chapter 2

### Literature Review

#### Theoretical Perspectives on Planning Community Health Education Programs

The adoption of healthy lifestyles and environments is a key element in primary and secondary prevention of chronic diseases. Many health promotion campaigns have attempted to reduce unhealthy behaviours, improve preventive services, and create better social and physical environments (McAlister et al., 1982). Disappointment with many of the marginal results has increased the demand for a more sound theoretical base for these health promotion activities (McAlister et al., 1982).

To effectively design and carry out a cohesive program, the Stanford Five City program (Farquhar et al., 1979) relied upon a blend of perspectives and theoretical formulas. They used ideas of community organization which create a receptive environment for educational materials and programs. In addition, they borrowed perspectives from the social marketing and the communication-behaviour framework.

The approach proposes a series of six steps.

1. Become aware
2. Increase knowledge
3. Increase motivation
4. Learn skills
5. Take action
6. Maintain behaviour change

The six steps are discussed more fully in the literature review in the next section of this thesis.

The communication-behaviour change framework focuses on the social and psychological perspective of how individuals and groups change



knowledge, attitudes and behaviour. This framework draws on the social learning model of Bandura (1977), the communication-persuasion model of McGuire (1967), the attitude change model of Ajzen and Fishbein (1980) and other theories that are relevant to community based education and health promotion.

McGuire (1981) proposes in the Communication Persuasion Model that in constructing a public health communication campaign, several questions must be asked to clarify the content and strategy of educational messages for particular groups. One series of questions involves developing profiles of high and low risk subpopulations. These questions would reveal lifestyle and media consumption differences that identify target groups as well as the type of media (or media mix) which is necessary to reach each high risk group.

Another step that McGuire (1981) calls "mapping the psychological matrix" involves collecting information on people's thoughts, feelings and behaviours which instigate and sustain the undesirable health-risk behaviour.

There are several strategies that can be used to implement a community-based high blood pressure prevention and control program. One is to market the message so that it reaches the target groups at risk. This type of marketing (social marketing) can create awareness about blood pressure and encourage changes in lifestyle. The first step in social marketing is to gain a thorough understanding of the consumer's attributes and needs. Well-designed database surveys are a basis for this understanding.

Social marketing is the design of programs which are developed

to increase the acceptability of a social idea or practise in a target group (Kotler 1975)." The design and implementation of an education program is an application of social marketing to community health promotion. The focus in social marketing is on the transaction whereby something of value is exchanged among parties (Farquhar et al., 1984). The techniques of social marketing are divided into four key elements: the four P's of marketing management (Kotler, 1975) which are product, price, place and promotion.

The "product" element is the availability of appropriate educational packages that target audiences are willing to accept or use. The "promotion" element is how to make the product familiar and acceptable through various forms of communication. The "place" element has to do with adequate and accessible distribution and response channels so that motivated individuals would know where the product can be obtained. The "price" element represents the cost to the buyer to obtain the product. This includes financial cost, as well as opportunity, energy and psychic costs. The perceived rewards for buying the product must be increased relative to the perceived costs. The health marketer must find adequate distribution of the health product, to a place where the consumer frequents, that a transaction is possible within the context of the people's lives and they can afford and will pay the price of the product (Kotler & Zaltman, 1973).

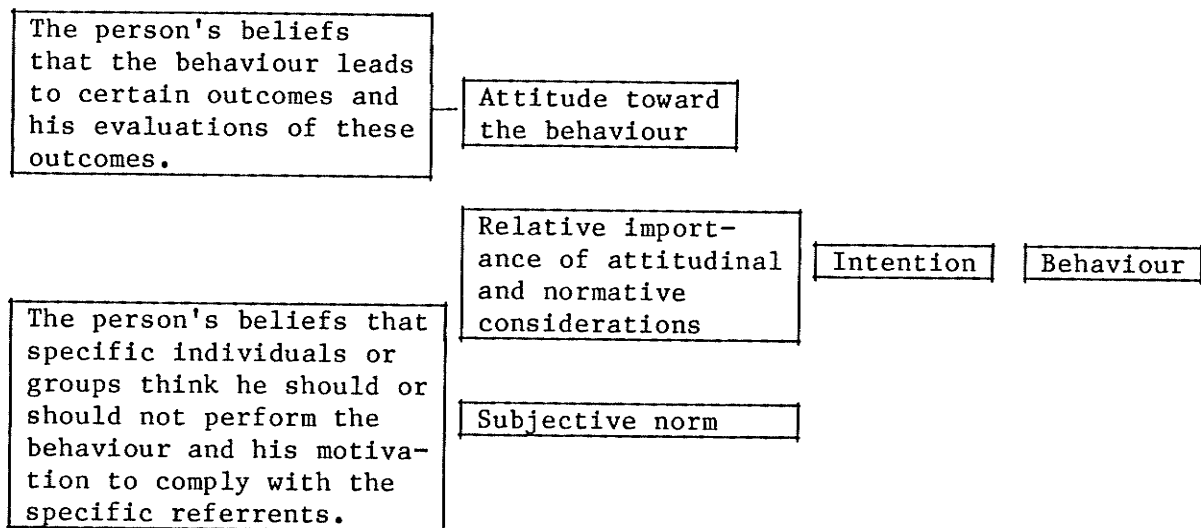
The relationship between what people feel they ought to do and what they do, however, is by no means simple. In everyday routine, people's behaviours are partly determined by social norms as well as by their own beliefs and attitudes.

Ajzen and Fishbein (1980) propose a combined model (See Figure 2) in which beliefs (and their related attitudes) must be combined with the individual's perceptions of his social norms in order to predict and understand social behaviour. According to the "Theory of Reasoned Action" (Ajzen & Fishbein, 1980), a behavioural intention is defined as an individual's subjective probability that he will engage in or perform a particular behaviour. An intention results from the combined operation of attitudes toward a behaviour (influenced by belief and expectations) and subjective norms concerning that behaviour. A subjective norm involves the person's beliefs that members of one's reference group feel that one should engage in a particular behaviour.

According to Fishbein and Ajzen (1975), the factors that influence intentions to act, such as to follow preventive regimens, can be altered. Behavioural intentions however can only be changed by altering either behavioural or normative beliefs (subjective norm). Programs that desire behaviour change must focus on altering individuals' salient beliefs regarding the health risk. To accomplish this task there must first be an assessment of what the population's most salient beliefs are.

The theoretical perspectives reviewed previously agree upon the value of evaluating the costs and benefits; both direct and indirect, to the target population in order to determine the potential barriers to behaviour change, (Social Marketing (Kotler, 1975); Theory of Reasoned Action (Fishbein and Ajzen, 1980); Communication Persuasion (McGuire, 1981). A market analysis or database survey is an essential step in program planning. This step is necessary to ascertain the population's

FIGURE 2

Factors Determining a Person's Behaviour

Note: Arrows indicate the direction of influence.

(Ajzen & Fishbein, Understanding Attitudes and Predicting Social Behaviour. 1980).

perception of the seriousness of the health threat, the availability of coping behaviour, and the suitability of a communication campaign to induce the public to undertake the promoted behaviour. Once these perceptions and beliefs are known, the program planners can provide the required information to predispose, enable and reinforce the population to alter their behaviour that places them at risk.

The next section of the literature review will report on programs that have utilized and/or recommended baseline data collection of the population's perceptions, beliefs and behaviours as an essential component of the program development.

#### Literature Relevant to Database Collection

The 1978-79 Canada Health Survey, (limited by single measurements) indicated that 225,000 Canadians would benefit from the initiation or improvement of high blood pressure treatment and that at least two million more would probably benefit from steps to reduce their blood pressure and from regular follow-up. It was estimated that a half a million persons were receiving medicine for heart disease or high blood pressure but still had elevated blood pressures.

Despite the general agreement that large numbers of Canadians have uncontrolled hypertension, there is an obvious need for accurate and precise studies of hypertension which will provide more accurate and precise estimates of sex, age and geographic variations and differences in knowledge, skills and practises.

The Federal/Provincial Advisory Committee on Community Health Services (1983) perceived that one of the dominant issues in the failure

to control high blood pressure in Canada was the lack of organized approaches to planning professional and public education, detection, follow-up and evaluation services.

An outstanding example of the feasibility of systematic efforts to increase public awareness of hypertension and to bring hypertensives into care or help them remain under care is the U.S. National High Blood Pressure Education Program (NHBPEP). At the program's inception in 1972, surveys were conducted to learn more about the public's perceptions of high blood pressure - its causes, symptoms and consequences, as well as sources of information about the disease. As a result of the original baseline data obtained, several high blood pressure education strategies were instituted. Surveys in 1979 and 1982 were designed to permit pre and post-test comparisons to examine the effectiveness of the existing education efforts. The surveys also identified those needs that must be met by future blood pressure education programs. Table 2 presents some of the findings from the three surveys (Rocella, 1984).

TABLE 2

Knowledge about High Blood Pressure

Questions	Survey Year		
	1973	1979	1982
1. What "Hypertension" Means	24%	32%	55%
2. What does High Blood Pressure Cause?			
a) Stroke	29%	38%	66%
b) Heart Attack/Heart Failure	24%	37%	77%
c) Kidney Problems	3%	11%	8%
3. What Causes High Blood Pressure?			
a) Bad Diet	19%	30%	35%
b) Heredity	7%	12%	16%
c) Too Much Salt	5	12%	31%

The above percentages represent the proportion of people in the sample giving the respective response.

The 1979 and 1982 studies determined that there had been a substantial increase in the proportion of people who could correctly identify hypertension as being the same as high blood pressure (24% to 32% in 1979, and to 55% in 1982).

The percentage of the total population recognizing high blood pressure as a cause of heart disease had almost tripled from 24% in 1973 to 77% in 1982. Two-thirds of the public now recognize that high blood pressure is a likely cause of stroke.

Although awareness increased, the percentage of hypertensives who had their condition under control remained fairly constant during these two time periods. Less than one-fifth of hypertensives were controlling their blood pressure.

This information led the NHBPEP planners to shift their educational strategies away from efforts to raise awareness to emphasize instead the long term therapy, maintenance and control of high blood pressure. The new educational objectives were developed to keep patients on therapy and to follow their physician's advice. This change in strategy may account for the increase in the percentage (from 16.5 to 34.1%) of hypertensives controlling their blood pressure by the third survey in 1980 (Lenfant and Rocella, 1984).

Health education programs must be linked to a scientific database and there must be consistent efforts to monitor programs and adjust program objectives continuously. The data determine whether past efforts have been successful, and suggest directions for future activities. The NHBPEP is shifting their emphasis once more to find avenues to reach subgroups of the population who continue to have high prevalence rates

for hypertension, low hypertension control rates and high mortality rates from the sequelae of the condition (for example, black women have a prevalence rate of hypertension that is almost double that for white females) (Lenfant and Rocella, 1984).

The aim of the evaluative research of the North Karelia Cardiovascular Disease Prevention Project was to assess the feasibility, costs, process and other consequences of the program for its first five years from 1971 to 1977 (Tuomilehto et al., 1984). The evaluation used baseline surveys of random, cross-sectional population samples at the outset and compared the results to a five-year follow-up survey (plus other data sources). The surveys showed that health behaviours and risk factors in North Karelia changed clearly during the five-year period in the desired direction. There was an overall net reduction in risk factor levels of 11.5% for females and 17.4% for males (Tuomilehto et al., 1984).

Analysis of the changes showed what particular aspects of individual health behaviour changed. Smoking behaviour changed (by 9.8 and 8% for males and females respectively) in the first year while the greatest increase in hypertension treatment took place in years two and three. There was a 3.6% (5.2 mm./Hg.) net reduction in systolic blood pressure and a 2.8% (2.6 mm./Hg.) decrease in diastolic blood pressure. Nutrition habits changes occurred throughout the five year period (4.1 and 1.2% reduction in serum cholesterol for males and females respectively).

The hypertension subprogram employed clear and practical programs to screen, treat and follow the 10-15% of the adult population with



hypertension. The program was multi-faceted and involved: (a) health education media promotion; (b) education and follow-up in community by public health nurses; (c) education of physicians and nurses prior to the program regarding diagnostic procedures and management of hypertension, (d) a central hypertension registry to assist screening, diagnosis and follow-up (Nissinen et al., 1981). The primary strategies to promote behavioural change were information, persuasion, training, social support, environmental change and community organization (Tuomilehto, 1984).

The Stanford Heart Disease Prevention Program relied upon a baseline survey to identify individuals "at risk" for cardiovascular disease as the target for a community-wide health education project (Meyer et al., 1980). The baseline data were compared on three annual follow-up surveys to determine and compare changes in the target population. Interventions were designed to reduce the risk of heart disease by increasing knowledge of risk factors and modifying dietary, smoking and exercise behaviour. A mass media campaign was administered to three groups. One of these groups was also given face-to-face instruction and another group served as a control. There was a significant increase in knowledge (measured by a 25 item knowledge test) and behaviour change in all of the media groups however, the group receiving face-to-face and media instruction achieved approximately double the increase of the other treatment groups. This group experienced significantly greater reductions in cigarette smoking; a 32% cessation rate and a 51% reduction in cigarettes smoked.

The media campaigns provided the knowledge (predisposing factor)

and skills (enabling factor) to accomplish recommended behaviour changes. The face-to-face instruction utilized techniques of social learning theories to personalize, individualize and reinforce the behaviour change (reinforcing factor).

The Stanford Five city program's (Farquhar et al., 1984) first educational goal is to achieve a transformation in the knowledge and skills of individuals and to stimulate and maintain lifestyle changes within the study population so that at least a ten percent reduction in overall risk status is achieved after two years of intervention. They estimated that a twenty percent reduction in overall risk will be achieved over a six-year period if the following changes were accomplished: (a) smoking - a nine percent net change in the proportion of smokers; (b) weight - a two percent net change in relative weight; (c) blood pressure - a seven percent change in systolic blood pressure; and (d) blood cholesterol - a four percent change in cholesterol.

The objectives included knowledge, attitude and behaviour changes that served as plans for educational projects. The objectives were evaluated through a process of formative evaluation. For example, the baseline survey showed that the majority of people knew that exercise was good for the heart but were still unable to begin exercise. Thus, the educational strategy would be to motivate people to act rather than to increase knowledge (Farquhar et al., 1984).

Morisky et al. (1983) conducted a needs assessment prior to planning an educational program for hypertensive patients. The education program resulting from the needs assessment demonstrated a positive impact on compliance behaviour, appointment keeping, weight control and

blood pressure control over a three year period. The hypertension-related mortality rate was 53.2 percent less in the experimental group (receiving educational program) than in the control group (Morisky et al., 1983). The results compare favorably with the Hypertension Detection and Follow-up Program (HDFP, 1979).

The researchers state that it is not the specific aspects of the program that should be recommended to other settings. It is rather

"the diagnostic approach to planning and adapting the individual components of such a program to predispose, enable and reinforce behaviour conducive to health that has generalizability to a variety of populations in different organizations of care" (Morisky et al., 1983, p. 161).

The Minnesota Heart Health program (MHHP) (Blackburn et al., 1984) is a research and demonstration project in community health education designed to reduce cardiovascular disease. The program uses multiple education strategies in a population-wide approach to Cardiovascular Disease Prevention. The incentive to develop MHHP came from the North Karelia Study (Tuomilehto et al., 1984) and the Stanford Three Community Study (Meyer et al., 1980). Results are not yet available, however as in the North Karelia and Stanford Studies, the MHHP conducted a baseline survey of knowledge and prevalence of relevant risk characteristics as an integral part of program planning.

The Oslo Study (Hjermer et al., 1981), reported that in a randomized trial, a positive effect from diet and smoking interventions on the incidence of coronary heart disease was found. Serum cholesterol values were 13% lower in the intervention than the control group, and mean tobacco consumption decreased 45% more in the intervention group. At the end of the five year trial the incidence of myocardial infarction

and sudden death was 47% lower in the intervention group. The methods used in the intervention group included informative advise on the risk factor concept (predisposing factor); specific instruction on how to alter the behaviours (enabling factor); and peer and family support groups (reinforcing factor).

The studies reviewed previously indicate generally a positive result in controlling blood pressure if the general public is made aware of the risk factors for hypertension and how to reduce them (predisposing); patients learn skills to participate in their own care (enabling); and there is ongoing family and peer group support (reinforcing factor).

Health promotion/education must be based upon a clearly defined rationale and systematic guidelines. To be effective, the program content should be derived from the population's current needs and gaps in knowledge. The programs that have been discussed in the preceding section have based their educational strategies on baseline data of the population's current level of awareness and knowledge. Formative research including baseline data collection is needed to ensure that programs and materials meet specific objectives for target audiences (Atkin, 1979).

#### Conceptual Framework for Database Collection

Two theoretical models have been combined to form the conceptual framework for this study. The "six steps in programming" that coincide with how Farquhar et al (1984) believe people progress to the adoption of new behaviours will be discussed first, and the "Precede" model

(Green, 1980) will be discussed second. Finally, the essential features of both models will be combined to develop guidelines for the questionnaire development for the data base collection.

#### A. Six Steps in Programming

The interplay of a multiplicity of factors, cultural norms, social pressures, personal beliefs, past successes and failures of health programs must be considered throughout planning, implementation and evaluation. To accomplish such a goal, there is a need for an eclectic health promotion format. An excellent example of such a synthesis is the Stanford Five Community Study (Farquhar et al., 1984).

Farquhar et al. (1984) have suggested six sequential steps in programming that coincide with the way they believe people progress to the adoption of advocated behaviours. These steps vary from person to person, however they can provide guidelines to both database collection and program planning. The steps are listed with the corresponding communication function:

1. Become aware (gain attention). Gain the public's attention and focus it on the existence of the problem and potential solutions. Mass media plays an important role;
2. Increase knowledge (provide information). Present information in layman's terms so that the issue will become personally meaningful and will predispose the person to act in a different way in the future;
3. Increase motivation (provide incentives). Appropriate communication can facilitate people to perceive the personal and social benefits of change;

4. Learn skills (provide training). As changes in complex habits of daily living are being promoted, it is necessary to provide skills training through step-by-step instruction on how to make the necessary changes;
5. Take action (model). Educational messages should act as cues to specific actions to stimulate the trial adoption of new behaviours.
6. Maintain (provide support). Inputs at this stage are necessary to promote self management and to provide reminders of personal and social benefits of behaviour change.

With reference to the six steps mentioned above, the guidelines for data base collection would be as follows:

1. Level of current awareness. This involves the measurement of the public's current level of awareness of their own health in general; the existence of hypertension as a health problem and the importance of lifestyle factors in preventing and controlling hypertension. Questions regarding information sources about health would determine what media channels would be most appropriate to gain the public's attention re hypertension.
2. Level of current knowledge. The misinformation and gaps in knowledge about blood pressure are identified: its measurement, persons at risk, effects of untreated high blood pressure, underlying risk factors, and lifestyle measures that can be taken to reduce the odds of developing hypertension and cardiovascular disease.

3. Level of current motivation. To determine what incentives could be included in health education strategies, requires a measure of the beliefs and perceptions that may be barriers to change and what beliefs would facilitate and support behaviour change (Fishbein and Ajzen, 1980).
4. Level of current skills. This requires an investigation of whether people know where to get their blood pressure checked and how often, how to alter eating and cooking habits to reduce salt and saturated fats in their diet?
5. Possible cues to specific actions. An examination of perceptions of susceptibility to the disease, seriousness of the disease and perceptions of benefit of behaviour change (or lack of) can be used to identify the types of cues necessary to promote action on knowledge gained.
6. Requirements for support and reinforcement of behaviour change. The personal and social benefits perceived must be determined by the public to be important reinforcements for behaviour change. For example, is support and approval from peers, work group or family required to maintain behaviour change?

B. Precede Model:

To plan health education programs to address a health problem, the most salient health behaviours that appear to be linked to the health problems must be considered first (Green, 1980). These salient health behaviours that leave people at risk for hypertension have been identified (Harvey et al., 1985) and are as follows:

I. (a) The public is unaware of the meaning, complications and the action to take with respect to hypertension (Nissinen et al., 1981; U.S. Preventive Health Services, 1983). (b) The public has limited awareness of the role of lifestyle in the development and maintenance of hypertension (Hjerman et al., 1981; Meyer et al., 1980).

II. Patients get lost in the medical referral system due to inadequate linkage between screening programs and the health care system (Adlerman et al., 1983).

III. Inadequate management (Joint National Commission on Detection, Evaluation and Treatment of High Blood Pressure, 1984).

IV. Lack of patient compliance (Morisky et al., 1983).

The above risks for hypertension are interrelated, and a comprehensive high blood pressure prevention and control program should include interventions for all four situations.

The Precede framework (Precede is an acronym for predisposing, reinforcing causes in educational diagnosis and evaluation) is a systematic model that overcomes disjointed health education/promotion program planning (Green, 1980). The model requires that one attempt to identify the causes of the outcome and then identify the means to intervene. The basic propositions of the Precede model are that one's health and health behaviour are the result of multiple factors. Therefore, efforts to affect health must be multi-dimensional as well.

Three classes of factors have the potential for affecting the conditions that leave people at risk for disease (Green, 1980). The three classes of behaviour are predisposing factors (a person's knowledge, beliefs, attitudes, values and perceptions that facilitate or hinder



personal motivation to change); enabling factors (available resources, policies and skills); and reinforcing factors (those factors that are related to feed back and reinforcement). The predisposing, enabling and reinforcing factors for the primary and secondary prevention of hypertension are as follows, (Harvey et al., 1985):

#### Predisposing Factors

The individual needs:

1. Knowledge and understanding of what hypertension is and its complications if untreated.
2. Knowledge and understanding of how hypertension is determined and treated.
3. Knowledge and understanding of the roles of lifestyle and medical care in the prevention and control of hypertension.
4. Belief that one can manage prescribed treatment regimens.
5. Clear directions for treatment.
6. Knowledge about where to go to find out one's blood pressure and where to seek treatment.
7. Clear directions for prevention.
8. Belief that alterations in specific lifestyle behaviours can decrease the probability of developing the disease.
9. Belief that hypertension is a serious disease.
10. Belief that anyone is susceptible to developing hypertension.

#### Enabling Factors

The individual needs the following:

1. Accessible screening sites which have linkages to the health care system.
2. Health education programs that address the predisposing factors listed above.
3. Programs to enable hypertensives to develop the necessary skills related to lifestyle changes and compliance with medical regimen.
4. Communication between physician and patient and patient follow-up by physician.
5. Family education for the development of social support.

#### Reinforcing Factors

1. Health promotion campaigns to reinforce awareness about hypertension and knowing own blood pressure.
2. Consumer groups promoting the labelling of food to include information on salt and cholesterol content and an indication of the number of calories per serving.
3. Programs for patients to learn self-monitoring skills with respect to lifestyle compliance.

The previously mentioned predisposing, enabling and reinforcing factors should be addressed in the instrument for data collection.

Farquhar's six sequential steps (1984) programming and the PRECEDE model (Green, 1980) can be combined to form a composite framework for data base collection. The predisposing factors (a person's awareness, knowledge, beliefs, attitudes, values and perceptions) relate to step one (awareness) and step two (knowledge) of Farquhar's six steps. Steps

three four, and five (skills, motivation and action) relate to PRECEDE'S enabling factors that facilitate personal behaviour change. Finally, support (step six) represents the reinforcing factors of the PRECEDE model. The following table (Table 3) illustrates the utility of combining these two models to guide the development of the questionnaire.

It has been documented previously by Kannel et al. (1984) that the recommended lifestyle changes to reduce the risk of cardiovascular diseases have been more frequent in the higher educational and income groups and among younger adults in the United States. Fishbein and Ajzen (1980) recommend that behaviour change programs be based on the population's salient beliefs regarding the health behaviour and its possible outcomes. Since there are a variety of beliefs re: hypertension in a population, a variety of strategies for implementation are required. McGuire (1981) suggests that information regarding lifestyle and media consumption differences are necessary to identify high and low risk groups as well as to clarify the content and strategies of health education programs for different groups.

Kotler (1975) states that a thorough understanding of the consumer's attributes and needs are necessary for the design of health programs that the target audiences will accept and use. The health product must be perceived to be available, acceptable, familiar, accessible, and within the cost range of the consumer (energy and psychic costs included). The perceived rewards for buying the product must be increased relative to the perceived costs.

A study based on the preceding guidelines for database collection and suggestions from literature reviewed would facilitate program

TABLE 3  
 CONCEPTUAL FRAMEWORK  
 FOR DATA BASE COLLECTION

Steps in Programming To Adopt Behaviour	PRECEDE MODEL
	<u>PREDISPOSING FACTORS</u>
1. <u>Awareness</u>	<u>Beliefs</u>
Existence of a health problem.	Everyone is susceptible to HBP.
Awareness of potential solutions to health problems.	HBP is a serious disease relative to other diseases.
Awareness of personal health.	Even though HBP is usually asymptomatic, it is still a serious (Meyer et al., 1980).
	High blood pressure (HBP) can be treated effectively (Morisky et al., 1982).
	Preventive health care is import- ant.
	Belief (awareness) that each individual can improve their own physical health.
2. <u>Knowledge</u>	<u>KNOWLEDGE</u>
Knowledge of disease; its causes, consequences, treatments and possible methods to prevent the disease.	What hypertension is? (Preventive Health Services, 1983).
	Who is susceptible to hyper- tension/HBP? (The Public & High Blood Pressure, 1985).
	What their own blood pressure is?
	What is normal blood pressure?
	The importance of medical care and follow-up in the treatment of hypertension (Morisky et al., 1983).
	HBP is a risk factor for stroke, heart and kidney disease (Fed. Prov. Advisory Committee on Comm. Health Services, 1983).
What actions can be taken to reduce risk.	Where one can go to find out what one's blood pressure is and how often one should have one's blood pressure checked (Alderman et al., 1983).

### 3. Motivation

Health care can be obtained with ease.

Perceived personal benefits to behaviour change.

Reduce personal and social barriers to change.

### ENABLING FACTORS

Health care is perceived to be available and accessible (Nissinen et al., 1984).

Awareness of own health status.

Fewer perceived barriers to self-help action.

### 4. Skills

Skills required to reduce risk of disease.

What lifestyle factors operate in the development and maintenance of HBP (Kannel et al., 1984; Hjermerman et al., 1981). How the factors can be modified.

### 5. Take Action

Educational messages should act as cues to stimulate the trial adoption of new behaviour.

Health message disseminated through appropriate communication channels to motivate individuals to change and/or provide "cue to action" (McGuire, 1981).

### 6. Support

Inputs to promote self management.

Reminders of personal and social benefit to change.

### REINFORCING FACTORS

Belief that others, particularly significant others, think that you should change some aspect of their lifestyle (Fishbein & Ajzen, 1980).

If I change any part of my lifestyle, I will feel healthier, look better, save money, make more friends, have more energy, possibly live longer, or feel satisfied that I'm taking care of my health.

planning in Manitoba. Any such study should describe the distribution of current beliefs, knowledge and practises with respect to hypertension by the study variables (age, sex, income group, educational level, hypertensive/non-hypertensive status and geographic area).

The database study would collect information on the following:

- media consumption differences between groups.
- geographic disparities in knowledge, beliefs and behaviour.
- income group disparities in knowledge, beliefs and behaviour.
- disparities in knowledge, beliefs, and behaviour by educational level.
- differences between sexes in knowledge, beliefs and behaviour.
- differences between hypertensive/non-hypertensive group in knowledge, beliefs and behaviour.
- perceptions of barriers to action (costs).
- perceptions of positive outcomes (perceived rewards) of behaviour change.
- incentives for action (e.g. beliefs regarding approval for behaviour change).
- perceptions of susceptibility to disease.
- perceptions of seriousness of the disease.

The conceptual framework discussed in this chapter was the basis for guiding the design of the data base survey. The procedures that were employed in the data collection and analysis will be discussed in Chapter Three.

### CHAPTER 3

#### PROCEDURES

##### Methodology

The principal purpose of this study was to collect data which would segment the adult population in Manitoba and test the study's hypothesis regarding the hypertension beliefs, knowledge and behaviours of the study population. Analysis of results showed the following differences among subgroups:

- differences between sexes, age and income groups and hypertensive/non-hypertensive groups in hypertension knowledge, beliefs and behaviour, perceptions of seriousness and susceptibility.
- differences between subgroups in media use and media preference.
- differences between groups in perceived barriers and possible incentives to behaviour change.

The survey also identified predisposing and enabling factors which may be associated with individual's willingness or resistance to comply with a health promotion program for the primary and secondary prevention of hypertension.

In addition, a rough estimate of the prevalence of hypertension in Manitoba was obtained.

##### Population

The population surveyed was Manitoba residents, 18 years and over with the exception of residents of Indian reserves who are under Federal jurisdiction. The Manitoba Health Services Commission (MHSC) listing of all Manitoban adults was the sampling frame from which a random sample was drawn.

### Study Design

The study design includes a simple random sample of Manitoba adults, 18 years of age and older. The random sample included 1500 individuals and included an urban (56% from Winnipeg)/(rural 44%) split in numbers. The MHSC provided a breakdown of the sample by four age groups and gender categories. Respondents were equally distributed among the following age ranges:

18 - 24	-	375
25 - 49	-	375
50 - 64	-	375
+65	-	375

Within each age range, selection was as follows:

105	urban males
105	urban female
83	rural male
82	rural females
<u>375</u>	

### Sample Size

The minimum sample size calculation was based on a 95% confidence interval, a tolerated sampling error of .05%, the Manitoba adult population size; 809,000 (MHSC listing as of Dec. 1, 1985) and the expected non-response rate of 50%.

$$\text{Step 1: } N1 = \frac{P(1-P)}{(\text{Standard error of } P)^2}$$

(Technotes: Inst. for Soc. and Economic Research, 1983)

N1 = initial estimate of sample size  
 P = proportion of the population with the characteristic of interest

$$\text{Standard error of } P = \frac{\text{Margin of error of } P}{2}$$

(for a 95% confidence interval)

$$N1 = \frac{(0.5)(0.5)}{(0.025)^2}$$

$$= 400$$



Step 2: Adjusting sample size for design effect. The design effect = 1 for a simple random sample.

$$N2 = \text{design effect} \times N1$$

$$N2 = 400$$

Step 3: Adjusting the sample size for population size

$$N3 = \frac{N2}{1 + \frac{N2}{N}} = N2 \times \frac{N}{N + N2}$$

$$N = \text{population size}$$

$$N3 = 400$$

Step 4: Sample size adjusted for non-response

$$N = \frac{N3}{r}$$

$$r = \text{response rate}$$

$$N = \frac{400}{.50} = 800$$

The number of subgroups into which the findings of the survey were to be grouped for analysis was an important factor in determining the sample size (Balin, 1982). The calculated sample size of 800 does not take into account the large number of subgroups that were compared in this study (three regions, hypertensive/non-hypertensive, three levels of educational attainment, four age groups, genders and three income groups). Thus, the total sample size needed to be larger than 800 to provide population estimates for the subgroups which would meet the study's precision and accuracy requirements.

The smallest subgroup for which data were to be analyzed was taken as the basic unit in estimating the total sample size (Balin, 1982). The "hypertensive" subgroup was likely be the smallest subgroup, as the yearly prevalence of hypertension in Manitoba was assumed to be similar to the national prevalence (approximately 10%). To ensure that all subgroups including the hypertensive subgroup had an adequate number of responses for comparisons by statistical analysis, the sample size was adjusted to 1500. With a sample size of 1500, and assuming a 50%

response rate (750 people), the hypertensive subgroup would consist of approximately 75-100 individuals (at 10% prevalence).

Unreported migration and deaths on the MHSC file were other considerations in determining the sample size. There is often a considerable delay in reporting status changes to MHSC and therefore a proportion of the random sample included individuals who had moved or deceased recently.

### Questionnaire Development

A mailed self-administered questionnaire (see Appendix A) was used for data collection in this study. Mail out surveys are the most cost-effective method of collecting data from large samples. With careful design and adequate follow-up, the response rate to a mail out questionnaire can be as high as seventy-eighty percent. (Institute for Social and Economic Research, 1983).

The questionnaire consisted of 46 questions in five categories:

- I. Personal Health Attitudes and Practices
- II. Information Sources
- III. Hypertension Knowledge and Beliefs
- IV. Perceptions, Knowledge and Beliefs of Lifestyle Factors - Salt, Cholesterol, Do Nothing, etc.
- V. Demographic Data

Before determining what the public knows and needs to know about hypertension, the public's general attitude toward their own health must be known: how people describe their own health compared with that of other people; how often people see a health care professional; have they

attempted to alter any lifestyle factors to improve their health. The first set of questions addresses general health attitudes and behaviours.

An effective education program must be channeled through the most appropriate media if the maximum number of people are going to benefit. Therefore, the second set of questions deals with information sources about health: whether people are able to find out what they need to know about health care and what they regard as important and reliable sources of information.

To identify misinformation and gaps in knowledge of the nature of hypertension (high blood pressure), the next set of questions focuses on knowledge of hypertension and related diseases. The analysis of responses should indicate target populations and suggest the content of the educational thrust: the public's perception of the seriousness of high blood pressure relative to other diseases; what they consider to be normal blood pressure; lifestyle factors associated with high blood pressure; the public's perception of susceptibility, that is, how likely it is that they will develop high blood pressure; what diseases can hypertension cause; does high blood pressure have symptoms; is high blood pressure treatable; is it preventable; what behaviours are necessary to prevent and/or control high blood pressure.

The next set of questions reflects the public's general view of lifestyle factors such as salt usage, diet and smoking. These behaviours are part of the non-pharmaceutical approach to reducing and controlling hypertension (Andrews et al., 1982) and also appear to play an important role in the prevention of hypertension.

A chart which illustrates the necessary factors for behaviour change and the corresponding questions that were included in a database questionnaire are found on the following table (see Table 4). The question numbers in the fourth column refer to the actual question numbers of the survey.

The questionnaire (see Appendix A) is an amalgamation of items that have been used in previous questionnaires in addition to questions designed specifically for this data collection.

Questions 6, 7, 8, 9, 10, 11, 12a and b, 16, 19, 20, 21, 28, 29 and 30 have been adapted from the U.S. Six Year Follow-Up Survey of Public Knowledge and Reported Behaviour (1985). Questions 12, 13 and 14 are from the Canadian Hypertension Study (1985); questions 31 a-3 and 38 a-c from the Manitoba Cardiovascular Health Survey (1983); questions 3, 4 and 5 from the Canadian Health Promotion Survey (1985). Questions 34 - 37 collect data on the populations beliefs regarding behaviour change to improve health, reflecting Fishbein and Ajzen's Theory of Reasoned Action (1980).

It is important to evaluate the validity of the questionnaire. That is, is the instrument an accurate measure to test the hypothesis of the study. The content validity of the instrument was determined through evaluation by and consultation with a variety of experienced academicians and researchers at the University of Manitoba and the University of Manitoba Research Limited. The instrument was modified a number of times in response to this evaluation, before the present form was derived.

The questionnaire was pre-tested on 17 individuals to ensure that

TABLE 4

QUESTIONNAIRE DEVELOPMENT

Six Steps to Adoption of Behaviour	Precede	Related Question	Question # of Questionnaire
1.			
<u>Awareness</u>	<u>Beliefs</u>		
Existence of a health problem.	Everyone is susceptible to HBP.	Do you feel that you are personally susceptible to HBP?	12b
	HBP is a serious disease relative to other diseases.	How widespread do you believe HBP is?	24
	High blood pressure (HBP) can be treated effectively (Morisky et al., 1982)	How likely is it that you might develop HBP some day?	23
		Compared to other diseases, how serious is HBP?	30
	Is there treatment for HBP?	20	
Awareness of potential solutions to health problems.	Even though HBP is usually asymptomatic, it is still a serious disease (Meyer et al., 1980)	Can a person with HBP tell when it is high?	25
		Can someone have HBP without having obvious symptoms?	27
	Preventive health care is important.	Do you usually have a check-up every year?	6
		Do you think that annual check-ups are a good idea?	8
		When was your last check-up?	7
		Believe that health care is important.	
Awareness of personal health	Belief (awareness) that each individual can improve their own physical health.	Is there anything you should do to improve your physical health? What things could you do? (Check from a list)	3

Six Steps in Adoptional Behaviour	Precede	Related Question	Question # of Questionnaire
2.			
<u>Knowledge</u>	<u>KNOWLEDGE</u>		
Knowledge of disease; it's causes consequences, treatments and possible methods to prevent the disease.	What hypertension is? (Preventive Health Services, 1983).	Select from a list what HBP means?	12a
	Who is susceptible to hypertension/HBP? (The Public & High Blood Pressure, 1985).	Select from a list what hypertension is?	28
	What their own blood pressure is?	Who can have high blood pressure?	12b
	What is normal blood pressure?	Who can have hypertension?	29
	The importance of medical care and follow-up in the treatment of hypertension (Morisky et al. 1983).	What was your blood pressure when it was last checked?	14b
		What is considered normal blood pressure for someone your age?	17
		Have you ever been told that you have high blood pressure?	15
		Are you currently being treated for HBP?	16
		Is there treatment for HBP?	20
		If a person gets their blood pressure down to normal, are they cured, or must he/she usually stay on some type of treatment?	26
	HBP is a risk factor for stroke, heart and kidney disease (Fed. Prov. Advisory Committee on Comm. Health Services, 1983).	From a list including stroke, heart and kidney disease, select which ailments are caused by HBP?	19
What actions can be taken to reduce risk.	Where one can go to find out what one's blood pressure is and how often one should have one's blood pressure checked (Alderman et al., 1983).	Have you ever had your blood pressure checked?	14a
		When was the last time?	
		Where can one go to have their blood pressure checked?	18
		How often should one's blood pressure be checked?	13

Six Steps in Adoptional Behaviour	Precede	Related Question	Question # of Questionnaire
3.			
<u>Motivation</u>	<u>ENABLING FACTORS</u>		
Health care can be obtained with ease.	Health care is perceived to be available and accessible (Nissinen et al. 1984).	When you want or need health information, is it available? When was the last time you had a check-up?	9 7
Perceived personal benefits to behaviour change.	Awareness of own health status.	How would you judge your own health compared to people your own age? Do you make more or less of an effort to improve your own health?	1 2
Reduce personal and social barriers to change.	Fewer perceived barriers to self-help action.	What is stopping you from making an improvement in your health? (Select reasons from a list.)	3 4 5
4.			
<u>Skills</u>			
Skills required to reduce risk of disease.	What lifestyle factors operate in the development and maintenance of HBP (Kannel et al., 1984; Hjeiman et al., 1981). How the factors can be modified.	To control or prevent HBP would help (or not help) to diet or to lose weight, exercise, take medicine, have a low salt diet, rest, have a low fat diet, stop smoking or reduce stress.	21 (control) 22 (prevent)
5.			
<u>Take Action</u>			
Educational messages should act as cues to stimulate the trial adoption of new behaviour.	Health message disseminated through appropriate communication channels to motivate individuals to change and/or provide "cue to action" (McGuire, 1981).	What are the ways people find out about health and medical care? What sources do people view as reliable?	10 11

Six Steps in Adopted Behaviour	Precede	Related Question	Question # of Questionnaire
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6.

SupportREINFORCING FACTORS

Inputs to  
promote self  
management.

Belief that others,  
particularly significant  
others think that you  
should change some aspect  
of their lifestyle  
(Fishbein & Ajzen, 1980).

Do you intend to alter some  
aspect of your lifestyle in  
the next year?

Would others approve or dis-  
approve of your lifestyle  
change?

36(a&amp;b)

Reminders of  
personal and  
social benefit  
to change.

Do important others think you  
should change some aspect of  
your lifestyle?

34

If I change any part of my  
lifestyle, I will feel healthier  
look better, make more friends,  
have more energy, possibly live  
longer, or feel satisfied that  
I'm taking care of my health.



questions were worded clearly and could be understood easily by the respondents. Since the sample represents a wide spectrum of abilities and backgrounds, the pre-test was issued to a variety of individuals from various backgrounds. Another purpose of the pre-test was to make certain that the flow of questions made sense and the instrument was not too long. Overall, the response to the pre-test was positive with respect to completion of all questions, comprehension of instructions and clarity of questions and answers.

#### Conducting the Survey

The questionnaire accompanied by a cover letter was sent to 1500 randomly selected participants in the fall of 1986. The cover letter (see Appendix B) explained the purpose of the survey, who funded the research, that anonymity and confidentiality were ensured and to request co-operation in completing and returning the questionnaire. A post card reminder (see Appendix C) was mailed two weeks after the initial mail out and a final letter (see Appendix D) and questionnaire were mailed two weeks after the post card reminder.

#### Response Rate

The response rate was 61.7 percent of 1500 (925 questionnaires were entered and analyzed). Factors that may have affected the response rate negatively were: the length of the questionnaire, and questions which requested personal lifestyle and health information. Reasons given by non-responders (an unrecorded number) for not responding to the questionnaire were mainly regarding lack of confidentiality and

opposition to being asked personal health questions. Eighty-eight respondents were ineligible as they were unable to return their questionnaire: three had deceased, 17 were infirmed or on an extended vacation and 68 could not be located due to an incorrect address on MHSC files. When the total sample size was reduced by the number of ineligible respondents (88), the response rate was calculated to be 65.5% (Dillman, 1978)

For a more detailed examination of the overall response rate, the response rates for individual age groups were calculated. They are as follows:

18-24 years	-	25.3%
25-44 years	-	79.9%
45-64 years	-	78.4%
65 + years	-	57.4%
No response	-	2.5%

As illustrated above, the overall response rate was lowered by the youngest age group (18-24 years) who had a response rate of only 25.3%. However, despite the low response rate of this group, a representative sample of the province for this age group was obtained (discussed in Chapter 4, p66).

During the data collection, 40% of all responses were received in the two week period following the first mailout, 31% were received in the two week period following the postcard mailout, and the remainder, 29%, were received subsequent to the third mailout. The pattern of response was as expected in a mail out survey. (Institute of Soc. & Ec. Research, 1983).

Non-response bias results from differential response rates in different subgroup populations and is increased when the response rate is below 50% (Siemiatycki and Campbell, 1984). Dillman (1978) states

that to reduce error in estimating the population characteristics, it is important to know whether the respondents differ from the respondents on important variables to the study. The extent of differences between respondents and non-respondents can seldom be determined without extensive follow-up of the non-responders (Dillman, 1978), however, comparing the distribution of sample characteristics with Census records can check for major differences in demographic variables. Since this study achieved a 65.5% response rate and adequately represented all subgroups of interest, the results of this survey can be generalized to the Manitoba population with certain limitations. The results can be interpreted with greater confidence where strong statistically significant relationships are found. Relationships that just meet the predetermined level of significance ( $P=.05$ ) should be interpreted carefully especially for relationships which involve subgroups that are under or overrepresented. Applying weighting factors to the sample subgroups to reflect the adult Manitoba population may have alleviated this bias. All results from a sample, however, are subject to some degree of sampling error (NHBPEP, 1981).

#### Editing and Data Processing

All questionnaires were edited and coded, and a ten percent check of surveys was done to ensure that no consistent errors were made. No questionnaires were rejected because the answers were incomplete, missing or could not be interpreted and coded. Some questionnaires which did not answer one or more questions were used in the analysis. The data were treated as missing values. Consequently, several tables in the chapter on results, were based on a total number of less than 925

(the total number of respondents). Other tables were based on numbers less than 925 due to skip logic in the questionnaire, for example, only those who had smoked could answer question 31(c), "How long ago did you quit?", and 31(d) "About how many cigarettes a day do you smoke now?" Non-response bias may be an alternate explanation for items that were not answered. For example, people who have less education are likely to be under-represented on some items as they may have difficulty reading and responding to those questions.

#### Definitions

##### Hypertensive/Non-Hypertensive

People were defined as hypertensive if they answered yes to questions numbered 15 and 16. Question 15 asks, "Have you ever been told that you have high blood pressure?". Question 16 asks, "Are you currently being treated for high blood pressure?". People were defined non-hypertensives if they answered no to both questions numbered 15 and 16.

The group that answered yes to "ever been told" and no to "currently being treated" for high blood pressure is an intermediate group that could represent two conditions:

1. Non compliers. Those who have been prescribed treatment but are not complying with treatment. OR
2. Those who were once told that they have high blood pressure, but it has returned to normal.

It was felt that follow-up questions to determine compliance would make the questionnaire too lengthy and thereby lower the response rate. Compliance is an important issue in the treatment of hypertension and

could best be analyzed in a separate study. Therefore, the "hypertensives" in this study are essentially "aware hypertensives" who are currently being treated. Whether the hypertensives are controlled (i.e. their high blood pressure treated effectively) or whether they are compliant with their treatment cannot be determined from this study.

#### Family History

Respondents were divided into groups according to whether anyone in their immediate family (parents, spouse, brothers, sisters, children) had ever had a stroke, high blood pressure, heart disease, kidney failure or diabetes [question 38(a)].

#### Income

Respondents were grouped into three income levels (Stats. Can., 1981) for the analysis (question 45) (total household income before taxes):

high income - \$ 35,000 per year or more  
middle income - \$ 20,000 - \$ 35,000 per year  
low income - \$ 20,000 per year or less

#### Level of Educational Attainment

In the analysis, respondents were grouped into 3 groups (question 40) by the highest grade or year of school that they completed:

high school or less  
some post-secondary education  
university graduate

Age

Respondents were categorized into groups, according to what year they were born (question 42). The age groups were:

- 18 - 24 years
- 25 - 44 years
- 45 - 64 years
- 65 years and over

Geographical Area

A Manitoba map was provided on the last page of the questionnaire (question 46) to allow respondents to indicate in which of three (3) regions of the province they live; Northern, Winnipeg and Southern regions.

Gender

Responses to Question 41 allowed grouping of respondents by gender.

Hypertension Knowledge

Responses to the following questions determined the current level of awareness and knowledge of hypertension in Manitoba:

	<u>Question Number</u>
what the term "high blood pressure" means	12(a)
who can have high blood pressure	12(b)
how often should blood pressure be checked	13
what was your blood pressure (when last checked)	14(b)
what's normal blood pressure for someone your age	17
what conditions & symptoms can be caused by high blood pressure	19

is there any treatment for high blood pressure	20
what measures can help control high blood pressure	21
what can lead to high blood pressure	22
how widespread is high blood pressure in the population	24
how can someone tell if their blood pressure is high	25
must people stay on treatment when blood pressure gets down to normal	26
can someone have high blood pressure without knowing	27
what does "hypertension" mean	28
who can have hypertension	29

#### Behaviour Related to Hypertension

Behaviour related to hypertension was determined by responses to questions 31 and 32. Question 31 deals with smoking behaviour; "have you ever smoked cigarettes regularly", "do you smoke cigarettes now", "have you tried to quit in the past 12 months", "have you ever been told to quit by a health professional", and "how many cigarettes do you smoke a day". Question 32 deals with previous attempts to change eating habits and intentions to change eating habits in the future by losing weight, cutting down on table salt, salt in cooking, fatty foods, or foods high in cholesterol.

Beliefs that people hold regarding their behaviour changes to improve their health are grouped according to whether significant others would agree or disagree (approve or disapprove) with their behaviour change (questions 34, 36, 37). The categories of significant others are spouse, family, co-workers, boss, other, or no-one. Beliefs regarding perceived outcomes of changing their lifestyle to improve their health

(question 35) are categorized as follows: look better, live longer, save money, make more friends, feel satisfied for taking care of health, experience no change.

#### Perceptions of Seriousness

The perceptions of the seriousness of hypertension in relation to the perceived seriousness of other diseases and conditions such as lung cancer, venereal disease, stomach ulcers, diabetes, back trouble, hepatitis, a heart condition, or a bladder infection are ranked on a scale of 1-5 (not serious - very serious) (question 30).

#### Perceptions of Susceptibility

The data was grouped according to whether or not the respondents feel that they might someday develop high blood pressure (question 23).

#### Information Sources About Health

Responses from questions 9, 10 and 11 allow categorization of the information sources about health by the sources that are most heavily utilized and by the sources that are perceived to be the most reliable.

#### Statistical Analysis

The data were analyzed for the total group and for a number of sub-groups (age, gender, hypertension status, region of province, income and educational level).

The SAS (SAS Inst. Inc., N. Carolina) statistical package was used. For all hypothesis, chi-squares were employed to determine whether the



results of the two categories are about what one would expect if the two were not related. The probability of obtaining each chi-square, or a more extreme one if there is no difference between subgroups is given. The pre-determined level of confidence of  $P=.05$  was chosen ( $df=3$  for age group comparisons;  $df=1$  for gender and  $df=2$  for education and income cross-tabulation). More stringent levels ( $P=.01$ ) to decrease the probability of a Type I error (rejecting a true hypothesis or saying that there is a difference between groups when there actually is no difference) could result in a Type II error, failure to detect a false hypothesis. Concluding that there is no difference between groups when there actually is a difference (Type II) could result in unnecessary time and money being directed to developing health education strategies which lacked specificity for target audiences. On the other hand, there also would be risks to a Type I error. Consequently, the significance level was set at  $P=.05$ , a compromise between the possibility of Type I and Type II errors (Spencer et al., 1976). Tests of statistical significance were used to test the following hypothesis:

Hypothesis I: Information sources about health:

(a) A significantly higher proportion of people with high incomes (\$35,000 a year and over) feel that they are able to find out what they need to know about health more than people of lower incomes. Hypothesis 1(a) was tested by comparing variables from question 45 and question 9.

(b) People under 44 years of age rely on newspaper articles, T.V., public service radio messages, relatives and friends for health information significantly more often than the elderly. Questions 10 and 42 were cross tabulated to test this hypothesis.

(c) In all subgroups (by age, income, education, hypertension status, gender), a significantly higher proportion of people rely on their own doctor or clinic for health information than on other health information sources. Variables from questions 45/42/40 and 15 plus 16 were cross tabulated with question 10 in the hypothesis.

(d) In all subgroups (age, gender, educational level, income and hypertension status), a significantly higher proportion will have visited a doctor or clinic for an appointment within the past 12 months than those who have not been to a doctor or clinic. Hypothesis 1(d) was tested by comparing variables from questions 45/42/40/41 and 15 plus 16 with question 7.

Hypothesis II: Susceptibility

(a) A significantly higher proportion of people with a family history of hypertension believe that they are more susceptible to developing hypertension than those without a family history of hypertension. To test this hypothesis, variables in 38(a) and variables in 23 were cross tabulated.

(b) Hypertensives have a family history of heart disease, stroke, kidney disease or hypertension significantly more often than those who are non-hypertensive. A "yes" answer to both question 15 and 16, plus 38 (a2) were combined with "yes" answers to question 23 and compared with "no" answers to question 15 or 16 combined with question 23 (yes).

Hypothesis III: Seriousness of selected diseases:

(a) Hypertensives and the elderly rate hypertension as being serious significantly more often than non-hypertensives and young people (35 years and under). Variables from question 15 and 16 and question 42 were cross tabulated with variables from question 30.

Hypothesis IV: Knowledge:

(a) University graduates and those with higher incomes are significantly more likely to know about high blood pressure (its possible causes and consequences, and how to prevent and control it) than those with less education and income. Variables from questions 40/45 were compared with questions, all 15 knowledge questions to test this hypothesis.

(b) Hypertensives have significantly greater knowledge regarding hypertension than non-hypertensives. All knowledge questions (15) were cross tabulated with question 15 and 16.

Hypothesis V: Behaviour

(a) A significantly greater number of persons with higher incomes (\$35,000 a year and over) or educational levels or under 35 years of age will have attempted to change their lifestyle to improve their health in the last 12 months more than their counterpart groups (lower income, lower education, over 35 years of age). Variables from questions 45/40/42 were compared with variables from questions 32(a) 31(e) and 31(b) and 33 to test hypothesis five.

CHAPTER 4ResultsCharacteristics of the Sample

The results will be presented under three headings; characteristics of the sample, results pertaining to the study's five hypothesis, and comparisons of interest.

Characteristics of the Sample

The analyses of this investigation were based on 925 respondents, a 65.5% response rate. The sample was divided into subgroups according to the variables or characteristics of interest to this study, including educational level, gender, age, income, region of the province and hypertension status. The following tables illustrate the distribution of the sample across the study's demographic variables.

Table 5  
Highest Grade or Year of School Completed

	<u>Proportion of Sample (%)</u>
High school or less	56.3
Some post-secondary	29.5
University graduate	12.6
No response	1.6
TOTAL	<u>100.0</u>

Table 6  
Gender

	<u>Proportion of Sample (%)</u>	<u>1981 Manitoba Census Data</u>
Male	45.1	49.0
Female	54.2	51.0
No response	.7	
TOTAL	<u>100.0</u>	<u>100.0</u>

Table 7  
Age

	<u>Proportion of Sample (%)</u>	<u>1981 Manitoba Census Data</u>
18 - 24 years	10.3	13.0
25 - 44 years	32.3	40.0
45 - 64 years	31.8	29.0
65 years and over	23.1	16.5
No response	2.5	
TOTAL	<u>100.0</u>	<u>100.0</u>

The distribution of respondents for the variables mentioned above statistically represent the distribution in the Manitoba population (chi square was non-significant at  $P=.01$ ). However, two age groups (18-24 years and 25-44 years) and females were slightly underrepresented and the two older age groups and males were slightly overrepresented. The strength of statistical relationships may be overestimated in the analysis of the groups which are underrepresented, and the reverse in cross-tabulations involving the groups which are overrepresented. This bias will be of concern particularly when the level of significance obtained is close to  $P=.05$ . However, if the significance reached is substantive, for example  $P=.001$ , then the bias in favor of one subgroup will not negate the statistical significance of the relationship.

Table 8  
Total Household Income for 1985

	<u>Proportion of Sample (%)</u>	<u>1981 Manitoba Census Data</u>
\$20,000 or less	34.5	38.0
\$20,000 - \$35,000	24.2	29.0
\$35,000 or more	31.1	33.0
No response/don't know	10.2	
TOTAL	<u>100.0</u>	<u>100.0</u>

All income groups were slightly underrepresented when compared to the 1981 Manitoba Census. While the non-response rate of ten (10) per cent to this question may account for the distribution, caution must be exercised when interpreting the analyzed relationships between income and other variables. In these cases, the statistical significance may be overestimated.

Table 9  
Region of Province

	<u>Proportion of Sample (%)</u>	<u>1981 Manitoba Census Data *</u>
Northern	9.3	7.2
Winnipeg	52.4	55.0
Southern	36.8	37.8
No response	<u>1.5</u>	
TOTAL	100.0	<u>100.0</u>

\* Using the same provincial divisions

The regional patterns of response were fairly consistent with the distribution of the Manitoba population and it is thereby concluded that the sample was statistically representative of the three areas of Manitoba.

For all characteristics of interest to this study, the sample adequately represents the adult population in Manitoba. No subgroups were significantly overrepresented or underrepresented. It therefore can be concluded that the sample is representative of the Manitoba population.

The next section of this chapter will discuss the study results with respect to the five hypothesis of the study.

Hypothesis 1: Information Sources About Health

(a) A significantly higher proportion of people with high incomes feel that they are able to find out what they need to know about health care than low income persons.

In the highest income group (\$35,000 or more per year), 93.6% reported that they were able to find out what they needed to know about health care. In the middle income group (\$20,000 - \$35,000 per year), and low income group (\$20,000 or less per year), 95 and 88.6 percent respectively reported that they were able to find out what they needed to know. A high percentage of all three income groups felt that they could find out what they needed to know about health care with the middle income ranking first and low income last (see Table 10).

Hypothesis 1(a) has been supported by the data however, caution should be exercised when interpreting the results as thirteen (13%) percent of the sample did not respond to the question on income.

Table 10

Able to Find Out About Health Care By Income (N=807)  
(Per Year)

<u>Income</u>	<u>Able to Find Out about Health(%)</u>
\$ 20,000 or less	88.6
\$ 20,000 - \$ 35,000	95.0
\$ 35,000 or more	93.6

\* 13% of the data are missing so the statistical significance (P=.01) should be interpreted with caution.

(b) People under 44 years of age rely significantly more on newspaper articles, T.V. public service messages, relatives and friends for health information significantly more than the elderly.

Compared to those over 65 years, higher percentages of individuals in the age groups 18-24, 25-44, and 45-64 years rely on public service messages on T.V. ( $P=.0001$ ), medical information on the T.V. ( $P=.0001$ ), and friends and relatives for health information (see Table 11).

All forms of print material including; health articles in the newspaper ( $P=.0001$ ), government publications ( $P=.001$ ), health books and health information in magazines were most frequently used by the middle age groups 25-44 and 45-64 years, followed by the elderly and those 18-24 years. Doctors are the most frequently mentioned source of health information in all age groups, however this trend appears to increase with age. Eighty-six percent of those over 65 years of age reported that they use a doctor/clinic for health information ( $P=.0001$ ).

The sources of health information are ranked in descending order for each age group. Doctors or clinics, T.V. public service announcements, newspaper health articles and T.V. medical information rank in the top five sources for every age group (see Table 11).

Hypothesis 1(b) supported that the majority of people in each age group subgroup relied most frequently upon a doctor or clinic for health information ( $P=.0001$ ).

1(c): In all subgroups income, education, gender, hypertension status) a significantly higher proportion of people rely on a doctor or clinic for health information than on other health information sources.

As illustrated in Table 12, both males and females rely more on a doctor or clinic for health information than on other information sources, however females (81%) rely on doctors more than males (68%)



**TABLE 11**  
**RANKING OF SOURCES OF HEALTH INFORMATION BY AGE GROUP**

(by percent within each age group)

	65 Years and Older	45 - 64 Years	25 - 44 Years	18 - 24 Years
1	*Doctors or clinic (86%)	Doctors or clinic (76%)	Doctors or clinic (71%)	Doctors or clinic (63%)
2	*Newspaper (43%)	Newspaper (53%)	PSA's (TV) (61%)	PSA's (TV) (54%)
3	*PSA's (TV) (36%)	PSA's (TV) (51%)	Medical Info (TV) (55%)	Friends and Relatives (53%)
4	*Medical Info (TV) (33%)	Medical Info (TV) (47%)	Newspaper (55%)	Medical Info (TV) (43%)
5	*Health Info Magazines (25%)	Health Info Magazines (34%)	Friends and Relatives (44%)	Newspaper (32%)
6	*Health Books (23%)	Health Books (33%)	Health Info in Magazines (43%)	Health Info in Magazines (31%)
7	*Friends and Relatives (23%)	PSA's (Radio) (27%)	Health Books (40%)	PSA's (Radio) (27%)
8	PSA's (Radio) (21%)	Friends and Relatives (25%)	PSA's (Radio) (30%)	Health Books (25%)
9	Medical Info (Radio) (20%)	Medical Info (Radio) (25%)	At Work (29%)	Medical Info (Radio) (23%)
10	*Gov't Publications (18%)	Gov't Publications (22%)	Gov't Publications (28%)	At Work (18%)
11	Public Health Nurse (9%)	At Work (14%)	Medical Info (Radio) (28%)	Public Health Nurse (12%)
12	*At Work (0.5%)	Public Health Nurse (10%)	Public Health Nurse (15%)	Gov't Publications (11%)
13	Health Information Telephone Line (0.5%)	Health Information Telephone Line (3%)	Health Information Telephone Line (2%)	Health Information Telephone Line (0%)

\* Indicates Statistical Significance at P=.05

TABLE 12

Sources of Health Information by Gender and Hypertension Status  
(listed in order of rank by percent)

Males		Females		Hypertensives (N=159)		Non-Hypertensives	
*Doctors/clinics	(68)	Doctors/clinics	(81)	*Doctors/clinics	(89)	Doctors/clinics	(72)
PSA's (TV)	(49)	Newspaper	(54)	Newspaper	(38)	PSA's (TV)	(54)
Medical info (TV)	(45)	PSA's (TV)	(52)	*Medical info (TV)	(35)	Newspaper	(51)
*Newspaper	(43)	Medical info (TV)	(47)	*PSA's (TV)	(33)	Medical info (TV)	(48)
Friends/relatives	(32)	Health info (magazines)	(39)	Health books	(26)	Friends/relatives	(37)
*Health info (magazines)	(28)	Health books	(38)	Health magazines	(26)	Health magazines	(35)
PSA's (radio)	(27)	Friends/relatives	(36)	*Friends/relatives	(20)	Health books	(33)
Medical info (radio)	(25)	PSA's (radio)	(26)	Gov't publications	(18)	PSA's (radio)	(29)
*Health books	(25)	Medical Info (Radio)	(25)	*Medical info (radio)	(16)	Medical info (radio)	(27)
Gov't Publications	(21)	Gov't publications	(22)	*PSA's (radio)	(14)	Gov't publications	(23)
At work	(17)	At work	(16)	Public Health Nurse	(13)	Public Health Nurse	(11)
*Public health nurse	(8)	Public health nurse	(14)	*At work	(7)	At work	(18)
*Health info line	(5)	Health info line	(3)	Health Info. Line	(2)	Health Info. Line	(2)

\* Indicates statistical significance at P=.05

( $P=.0002$ ). Females also use every other information source mentioned to a greater degree than males (except people at work, friends/relatives and health information line).

The hypertensives rely on a doctor for health information considerably more than the non-hypertensive group (89% vs 72%). Hypertensives also use a doctor or clinic for information far more than they use any other source (see Table 12). The next most frequently reported information source was newspaper health articles (38%) while the non-hypertensives subgroup checked public service announcements on television as the second most frequent source (54%).

All income and educational groups rely more on a doctor or clinic for health information ( $P=.05$ ) than other information sources. The low educational and income groups utilize a doctor or clinic more and other information sources less than other groups (See Tables 13 & 14). The middle and high educational and income groups rely heavily on the television and newspaper as well as on a doctor for health information while those earning less than \$25,000 per year, or are non-high school graduates, use a doctor as their major information source.

Hypothesis 1(c) was supported by the data. In all subgroups (age, gender, income, education and hypertension status), the majority rely on their doctor or clinic for health information.

While doctors and clinics were the most utilized source of health information, there was consistency across all subgroups for the next three (3) highly used sources; public service announcements on television, medical information on television, and health articles in the newspaper. Friends/relatives, health articles in magazines and health

Table 13  
Sources of Health Information by Education  
(listed in order of rank by percent)

High School or Less		Some Post Secondary		University Graduate	
*Doctor/clinic	(78)	Doctor/clinic	(71)	Doctor/clinic	(70)
*PSA's (TV)	(44)	PSA's (TV)	(60)	Newspaper	(66)
*Newspaper	(42)	Newspaper	(58)	PSA's (TV)	(63)
*Medical info (TV)	(40)	Medical info (TV)	(54)	Medical info (TV)	(54)
Friends/relatives	(31)	Health magazines	(40)	Health magazines	(46)
Health books	(29)	Friends/relatives	(36)	Friends/relatives	(44)
*Health magazines	(28)	Health books	(35)	Health books	(42)
*PSA's (radio)	(21)	PSA's (radio)	(32)	PSA's (radio)	(39)
*Medical info (radio)	(19)	Medical info (radio)	(30)	Medical info (radio)	(39)
Gov't publications	(16)	Gov't publications	(29)	Gov't publication	(35)
*At work	(12)	At work	(21)	At work	(26)

\* The relationship between level of education and that source of information was statistically significant (P = .05 or less).

Table 14  
Sources of Health Information by Income  
 (listed in order of rank by percent)

\$20,000 Per Year or Less		\$20,000 - \$35,000 Per Year		\$35,000 Per Year or More	
*Doctor/clinic	(79)	Doctor/clinic	(77)	Doctor/clinic	(72)
*PSA's (TV)	(40)	PSA's (TV)	(61)	Newspaper	(59)
*Newspaper	(39)	Newspaper	(57)	PSA's (TV)	(58)
*Medical info (TV)	(38)	Medical info (TV)	(55)	Medical info (TV)	(50)
Health books	(28)	Health magazines	(37)	Health magazines	(42)
Friends/relatives	(28)	Health books	(34)	Friends/relatives	(40)
*Health magazines	(26)	Friends/relatives	(33)	Health books	(37)
PSA's (radio)	(22)	PSA's (radio)	(32)	PSA's (radio)	(29)
Medical info (radio)	(20)	Medical info (radio)	(29)	Medical info (radio)	(28)
Gov't publications	(16)	Gov't publications	(27)	Gov't publications	(26)
*At work	(8)	At work	(21)	At work	(25)

\* The relationship between income and sources of information reached statistical significance ( $P = .05$ ) for the starred (\*) sources, however since approximately 11 percent of data was missing, caution should be exercised in the interpretation.

books were the next most frequently mentioned sources, followed by radio (PSA's and medical information), government publications and people at work. Public health nurses and health information telephone line were reported infrequently. Although doctors and clinics were the most utilized information sources in all subgroups, the proportion of people who reported that they rely upon doctors and clinics was greater in some subgroups. The groups with the highest proportions who rely on a doctor for health information were hypertensives (89%), females (81%), low income groups (79%) and non-high school graduates (78%).

When respondents were asked to write down what they believed to be the three most reliable sources of health information, the responses were as presented in Table 15.

Table 15

Percent of Respondents Who Answered the Question (N = 824)

doctor or clinic	81
T.V. (PSA's/medical information)	41
health books	31
government publications	25
public health nurse	23
newspaper health articles	18
radio (PSA's/medical information)	16
health information magazines	13
friends/relatives	7

The sources that were perceived to be the most reliable by the respondents were similar to the sources that were most frequently used, however, there is a difference between the proportion of people who used these sources and the proportion of people who perceived these sources to be reliable. Doctors or clinics and television appear to be both highly utilized and perceived to be reliable information sources.

Newspaper and radio were frequently used sources, but were only rated as reliable by eighteen (18) and sixteen (16) percent respectively. Health books, government publications and public health nurses were perceived to be reliable by a majority of people who used them as a health information source.

1(d): In all subgroups (age, gender, educational level, income and hypertension status), a significantly higher proportion will have visited a doctor or clinic for an appointment within the past 12 months. As illustrated in Table 16 below, the data supported this hypothesis.

Table 16

Visited a Doctor Within the Past 12 Months

<u>* Gender</u>	<u>%</u>	<u>* Age</u>	<u>%</u>
Males	75	65 years and over	90
Females	85	45 - 64 years	80
		25 - 44 years	78
		18 - 24 years	71
<u>Income</u>	<u>%</u>	<u>Education</u>	<u>%</u>
\$20,000 or less	83	High school or less	81
\$20,000 - \$35,000	79	Some post-secondary	83
\$35,000 or more	79	University graduates	74
<u>* Hypertension Status</u>	<u>%</u>		
Hypertensive	97		
Non-hypertensive	77		

\* Indicates statistical significance at  $P=.05$

The subgroups with the highest proportions of people who have seen a doctor in the past year were the hypertensives (97%), those over 65 years of age (90%), females (85%), those of lower income (83%) and middle educational group (81%). Males, young people and non-hypertensives were significantly less likely to have seen a doctor recently (75%, 71% and 77% respectively). There appears to be a tendency for those of high income or educational levels to see a doctor less frequently than those with lower incomes or educational levels.

#### Hypothesis 2: Susceptibility

2(a): A significantly greater number of people with a family history of hypertension believe that they are more susceptible to developing high blood pressure than those without a family history of hypertension.

Forty-five (45%) of all respondents felt that they might develop high blood pressure some day (34% were not sure).

Eighty percent of those people who reported having a family history of hypertension (N = 468) compared to 55% without a family history of hypertension felt that they might develop high blood pressure some day (P=.0001). Since some data were missing in the analysis, the level of statistical significance may be overestimated and should be viewed with caution.

2(b): Hypertensives have a family history of heart disease, stroke, kidney disease or hypertension significantly more often than those who are non-hypertensive.

Only two percent of the hypertensives in the study (vs 12 percent



of non-hypertensives) did not have a family history of the above mentioned diseases.

Thirty-eight (38%) percent of the hypertensives had a family history of one of the diseases compared to 42% for the non-hypertensives, while 60% of the hypertensives had a family history of two or more of these diseases (compared to 56% of the non-hypertensives). The difference between the two groups was statistically significant at  $P=.0001$ . Hypothesis 2(b) was supported by the data.

### Hypothesis 3: Seriousness of Selected Diseases

(a): Hypertensives and the elderly rate hypertension as being more serious significantly more often than non-hypertensives and young people (35 years and under).

The following diseases were perceived to be serious or very serious by the respondents: lung cancer, stroke, heart condition, kidney trouble, hepatitis, venereal disease, high blood pressure, diabetes, stomach ulcers, back trouble and bladder infection (listed by rank). High blood pressure ranked seventh with 53% rating it as serious or very serious, 13% as not serious or slightly serious and 34% as neutral.

In the hypertensive subgroup, 59% rated high blood pressure as serious or very serious while in the non-hypertensive group, 52% rated high blood pressure as serious or very serious ( $P=.02$ ). In both groups, approximately 13% rated high blood pressure as not serious or slightly serious.

Table 17 shows how the different age groups rated the seriousness of high blood pressure.

Table 17

	Perception of Seriousness by Age	
	Not Serious or Slightly Serious %	Serious or Very Serious %
65 and over	14	57
45 - 64	14	52
25 - 44	10	54
18 - 24	13	46

The oldest group (65 years +) rated high blood pressure as serious or very serious more frequently than the other age groups. The differences between the subgroups was statistically significant at  $P=.04$ .

Hypothesis 3 has been supported by the data. Hypertensives and the elderly rate hypertension as being serious significantly more often than their counterpart groups.

#### Hypothesis 4: Knowledge of Hypertension

4(a and b): University graduates, hypertensives or those with higher incomes (\$35,000 plus) are significantly more likely to know about high blood pressure (its possible causes and consequences and how to prevent and control it) than those with less income and education and non-hypertensives.

Knowledge regarding whether there is an effective treatment available for high blood pressure was high for all subgroups, ranging from 97% for males, females, those of low income and education to 99 and 100% for hypertensives and university graduates respectively. When the "not sure" responses were calculated, 92% felt that there was an effective treatment and eight percent were not sure.

Approximately 28% of all respondents knew that normal blood pressure was 120/80 mm Hg. Higher income and educational subgroups and females knew this more frequently than their counterparts.

Table 18 shows that overall knowledge of methods to help control blood pressure was higher in certain subgroups; higher educational and income groups, hypertensives and females. It is however interesting to note that males more than females responded to "stop smoking" and "see a psychiatrist" and that non-hypertensives more than hypertensives responded to "stop smoking" and "regular exercise" as methods to help control hypertension.

Knowledge that high blood pressure means hypertension was greater in those with higher incomes and education, females and hypertensives (see Table 19). The same pattern of responses was evident for "who can have high blood pressure" (anyone being the most correct answer) (see Table 20).

Knowledge that blood pressure should be checked once a year increased with education and income. The lower education and income groups, hypertensives and males responded more frequently that you should get your blood pressure checked twice a year, rather than once a year (see Table 21). The subgroups with the highest percent of people who actually had their blood pressure checked within the last year was higher in the hypertensive group (97.5%), females (82%), the lowest income group (80%), and the middle educational group (80%). University graduates and males had least often had their blood pressure checked within the past year (71% and 71% respectively) (see Table 22).

Table 18  
Methods to Help Control High Blood Pressure  
By Education, Gender, Income and Hypertension Status  
(in percent)

	Education			Gender		Income			Hypertensive Status	
	H.S.	P.S.	U.G.	M	F	Low	Mid	High	Hypertensive	Non-Hypertensive
Lose weight	*79	86	88	83	82	*75	87	86	84	82
Take medicine	*71	79	80	*68	80	*70	77	81	*87	72
Regular exercise	*70	82	87	74	77	67	83	79	70	76
Low salt diet	*84	93	92	*84	90	*82	92	88	*92	86
Rest a lot	*23	19	11	18	22	*27	17	17	*35	17
Low fat diet	*66	76	75	*66	73	67	72	71	*77	68
Stop smoking	*70	78	79	76	72	*67	79	79	70	74
Reduce stress	*70	80	89	72	78	*63	83	85	75	75
Stop drinking alcohol	61	63	49	62	61	57	65	64	64	61
See a psychiatrist	7	9	11	*10	6	7	8	8	8	8

\* An asterisk (\*) in the top left hand corner of a cell indicates statistical significance at P=.05.

Table 19

High Blood Pressure Means Same as Hypertension (In Percent)

Education Level*		Gender*		Hypertension Status*		Income*	
High school or less (H.S.)	40	Male (M)	40	Hypertensive (H)	55	\$20,000 or less	34
Some post-secondary (P.S.)	51	Female (F)	53	Non-Hypertensive (Non-H)	45	\$20,000 - 35,000	55
University Graduate (U.G.)	65					Over \$35,000	56

Table 20

Who Can Have High Blood Pressure (Anyone)

Education Level*		Gender*		Hypertension Status*		Income*	
H.S.	84	Males	86	Hypertensive	88	\$20,000 or less	81
P.S.	90	Females	87	Non-Hypertensive	86	\$20,000 - 35,000	89
U.G.	92					Over \$35,000	91

\* Indicates statistical significance  $P < .05$ .

Table 21

How Often Should You Have Your Blood Pressured Checked

(In Percent)

	<u>Once a Year</u>	<u>Twice a Year</u>
<u>Education</u>		
High School	62	36
Some Post Secondary	68	30
University Graduate	73	25
<u>Income*</u>		
\$20,000 or less	58	41
\$20,000 - \$35,000	64	32
Over \$35,000	73	26
<u>Hypertensive Status</u>		
Hypertensive	52	46
Non-Hypertensive	68	30
<u>Gender*</u>		
Male	62	35
Female	68	31

\* Indicate statistical significance at  $P=.05$

When asked to select from a list what the word hypertension means, the responses were similar in pattern as to the question in reverse, "what does high blood pressure mean". Knowledge was greater for females, hypertensives and increased with income (see Table 23).

Across all subgroups, the incorrect perception that hypertension means too much tension (48%) or a nervous condition (30%) is quite prevalent.

Table 22  
Blood Pressure Checked Within Past Year  
(in percent)

Education Level	Gender*	Hypertension Status*	Income
High school or less (H.S.) 77	Male (M) 71	Hypertensive (H) 97.5	\$20,000 or less 80
Some post-secondary (P.S) 80	Female (F) 82	Non-Hypertensive (Non-H) 73	\$20,000 - 35,000 75
University Graduate (U.G.) 71			Over \$35,000 75

\* Indicate statistical significance at P=.05.

Table 23  
What Does "Hypertension" Mean (in percent)

	Education Level			Gender		Income			Hypertensive Status	
	H.S.	P.S.	U.G.	M	F	20,000		Over 35,00	H	Non-H
						20,000	35,000			
Bad nerves	20	15	9	19	16	19	18	13	16	17
Nervous condition	*34	26	24	32	29	*35	28	26	31	30
High blood pressure	*44	62	58	*46	55	*44	54	59	*61	49
Too much tension/ pressure	49	45	50	48	48	49	47	46	44	49
Over-excited	*32	25	24	32	27	31	27	28	25	30
Overactive	*23	20	10	23	18	23	19	17	19	21
Not sure	*12	7	7	11	9	12	8	9	8	10

\* Indicates Statistical Significance at P=.05.



The highest proportion (approximately 49%) of individuals in every group of interest estimated the prevalence of hypertension to be between 20-40% of the population. Only 25% of every subgroup correctly estimated the prevalence to be 10-20% of the population, while five percent thought it to be less than 10% of the population and 21% overestimated the prevalence to be 40-60% of the population.

The variation between subgroups is as follows: males, university graduates and people who make more than \$35,000 per year more often than people in other income and education groups and females reported that the prevalence of high blood pressure is less than 20%. Hypertensives, more than non-hypertensives ( $P=.003$ ) feel that hypertension is a very widespread disease (over 20% of the population). Approximately seventy (70%) of all respondents overestimated the prevalence of high blood pressure.

For the major conditions caused by hypertension, a greater percentage of females than males attributed cause to high blood pressure for eye and kidney problems and stroke (see Table 24). Sixty-five (65) percent of males and 64% of females thought that heart problems were caused by high blood pressure. Females, middle income earners, and people with some post-secondary education responded more frequently to symptoms that are usually not caused by high blood pressure; nosebleeds, headache, and dizziness. In general, accurate knowledge increased with education and with income to the middle income and educational level. Responses to the unrelated diseases and symptoms were infrequent (pneumonia, arthritis). Hypertensives more often than non-hypertensives

Table 24  
Conditions and Symptoms Caused by High Blood Pressure

(in percent)

	Education Level			Gender		Income			Hypertensive Status	
	H.S.	P.S.	U.G.	M	F	\$20,000 - \$35,000		Over \$35,000	H	Non-H
						\$20,000	\$35,000			
Stroke	*81	88	90	*82	87	*80	88	86	83	85
Nosebleeds	40	47	46	*40	46	*38	50	42	43	41
Headache	55	62	60	*50	64	54	62	58	64	56
Heart problems	*60	68	73	65	64	*59	62	71	65	64
Dizziness	59	62	55	*54	64	56	67	57	62	58
Eye problems	*15	22	23	*15	21	15	20	19	22	17
Kidney problems	*15	23	22	16	20	17	19	20	23	17

\* Indicates statistical significance at P=.05.

knew what high blood pressure can cause, except for stroke (hypertensives 83% vs non-hypertensives 85%). Hypertensives also responded more frequently that dizziness, headache and nosebleeds can be caused by high blood pressure.

The factors that may lead to high blood pressure were ranked by all of the respondents as indicated in Table 25:

Table 25

Factors That May Lead to High Blood Pressure

	<u>Percent</u>		
Overweight	92	Heredity	42
Eating salt	81	Coffee	38
Stress/strain	78	Pregnancy	35
Eating fatty foods	72	Old age	31
Smoking	66	Low income	13
Lack of exercise	62	Race/ethnicity	8
Alcohol	53		

Overweight (92%) and salt intake (81%) were the most prevalent responses to "what may lead to high blood pressure". The perception that stress/strain can lead to high blood pressure was greater in non-hypertensive (80%), females (82%) and increased with education and income. Hypertensives did not respond significantly better or worse than non-hypertensives on this question.

University graduates, those with some post secondary education and those with income of \$25,000 per year or more frequently mentioned that smoking, heredity, race, lack of exercise and overweight lead to high blood pressure.

Knowledge that a person can have high blood pressure without knowing it (99-100%) and that a person must stay on treatment even when their blood pressure gets back to normal was very high (92-98%) (see Tables 26 and 27). When the "not sure" responses were calculated into

Table 26

Can Have High Blood Pressure Without Knowing It (Yes)

Education Level			Gender		Income			Hypertensive Status	
H.S.	P.S.	U.G.	M	F	20,000	20,000 - 35,000	Over 35,000	H	Non-H
99	100	100	99	100	99	100	100	99	99

Table 27

Cured Once Back to Normal (Stay on Treatment)

Education Level			Gender		Income			Hypertensive Status	
H.S.	P.S.	U.G.	M	F	20,000	20,000 - 35,000	Over 35,000	H	Non-H
94	92	96	93	94	94	95	92	*98	93

the percentages, the knowledge level was slightly reduced; can have high blood pressure without knowing it (92%) and a person must stay on treatment (81%). Public knowledge of the asymptomatic and chronic nature of high blood pressure appears widespread. However, when asked "how can someone tell if their blood pressure is high", a variety of responses were checked, besides "go to a doctor/nurse" or "you cannot tell" (see Table 28). "Having headaches" or "getting flushed" or "dizzy" were frequent responses. The lower income and educational groups and females favor "getting dizzy" or "tired and weak", as symptoms of high blood pressure, while "having headaches" or "getting flushed" was responded to more by people in the middle and upper educational and income groups and females. The hypertensives more than non-hypertensives checked go to a doctor/nurse as well as "getting dizzy" or "flushed" or "having a headache". Less than 20% of each subgroup responded to "cannot tell" and 68% percent responded "to go to a doctor/nurse". It appears that although approximately 92% of the respondents knew that you can have high blood pressure without knowing it, they also think that there are usually signs or symptoms which accompany high blood pressure.

#### Hypothesis 5:

A significantly greater number of persons with higher incomes or higher educational levels or under 44 years of age will have attempted to change their lifestyle to improve their health in the last 12 months (or intend to improve their health within the next 12 months) more than their counterpart groups.

Table 28

## How Can Someone Tell If Their Blood Pressure Is High

	Education Level			Gender		Income			Hypertensive Status	
	H.S.	P.S.	U.G.	M	F	20,000 - 35,000		Over 35,000	H	Non-H
						20,000	35,000			
Go to doctor/nurse	*63	75	69	65	69	*63	67	73	*74	65
Get dizzy	55	58	50	*50	61	*56	62	51	61	55
Headaches	50	55	53	*42	60	50	56	49	56	51
Get flushed	39	45	42	38	43	*34	43	44	44	40
Tired and weak	33	32	28	30	33	*34 (12% data missing)	35	26	*41	30
Cannot tell	* 9	11	20	12	10	*12 (12% data missing)	7	15	*20	9
Not sure	17	17	13	17	15	18 (data missing)	15	15	* 6	18

\* With data missing, interpret statistical significance with (P=.05) caution.

Sixty (60) percent of all respondents (N=555) have tried to change their eating habits in the past year. Of those people, 73% tried to lose weight, 70% to reduce fatty foods, 51% to reduce cholesterol intake and 50% to cut down on table salt. Of the respondents who intend to change their lifestyle in the next year (852), they intend to do so by increasing physical activity (59%), losing weight (53%), reducing fat intake (44%), reducing salt intake (37%), reducing cholesterol (33%), and stop/reduce smoking (24%).

With the exception of trying to lose weight to improve health, attempts to change eating habits in the past year (by methods listed in Table 29) decreased with increasing income and education and increased with age. Younger people, university graduates and people with higher incomes more frequently checked that they were trying "other" methods to improve their eating habits.

Intentions to change lifestyle in the next 12 months by increasing physical activity increased with income ( $P=.0001$ ) and decreased with age ( $P=.0001$ ) (see Table 30). Intentions to lose weight in the next year were only slightly higher in the higher income and educational groups. However, for lifestyle changes such as reducing salt intake, stopping smoking or getting their blood pressure checked, intentions decreased with increasing income (see Table 30). The intentions to reduce salt intake, reduce cholesterol and get blood pressure checked increased significantly with advancing age. The reverse trend was significant for increasing physical activity and stopping smoking.

People of higher income and education and youth are not changing their behaviour significantly more than other groups except for

Table 29

Tried to Change Eating Habits in Past Year

Percent of those who had tried to change eating habits (60%)

	Education Level			Age				Income		
	High School	Some Post Sec.	Univ Grad	65+	45-64	25-44	18-24	\$20,000 - \$35,000	Over 35,00	
Lose weight	71	70	83	68	74	76	70	68	69	78
Reduce table salt	*53	49	36	*73	55	38	29	*59	48	44
Reduce salt in cooking	42	38	29	*54	42	33	17	45	39	36
Decrease fatty foods	71	69	61	79	74	63	56	*74	70	64
Cut down on foods high in cholesterol	52	53	43	*65	61	39	33	*58	54	45
Other	*12	15	25	* 9	11	18	25	10	16	19

\* Indicates statistical significance at P=.05.



Table 30

Intentions to Change Lifestyle in the Next 12 Months by Age, Income, Education

(in percent)

Lifestyle Change	AGE				INCOME			EDUCATION		
	65 & Over	45-64	25-44	18-24	Less than \$20,000	\$20,000-35,000	More than \$35,000	Less than H.S.	Some Post Sndry.	Univ. Grad.
Lose weight	48	56	56	46	52	51	55	53	52	56
Reduce fat intake	*43	47	46	28	41	49	42	43	47	38
Reduce salt intake	*45	42	30	28	*44	33	31	40	36	26
Reduce cholesterol	*36	38	29	21	38	32	29	32	37	27
Increase physical activity	*40	56	71	73	*46	63	72	51	68	75
Stop/reduce smoking	*15	24	26	30	26	24	20	26	22	17
Get B.P. checked	*55	48	29	29	*47	40	36	42	41	36
Other methods	7	4	6	8	7	6	4	6	5	5

\* Indicates statistical significance at P=.05.

attempting to reduce/stop smoking or increase physical activity. In fact, they appear to be changing certain behaviours less than other groups. Hypothesis 5(b) was supported by the data for these two behaviours only.

A review of some of the other analysis or comparisons of interest that were generated from the data are presented in the next section of this chapter.

### Comparisons of Interest

#### I. Barriers to Behaviour Change:

The following table (Table 31) shows what the perceived barriers to behaviour change were among the respondents who answered the question, "Is there anything stopping you from making improvements in your health"?

Table 31

	<u>Percent</u>
Problem not serious	20
Lack of time	17
Don't want to change current habits	8
Change is too difficult	6
Lack of knowledge	5
Lack of support	4
Too costly	2
Other	8

Perceptions that the problem is not serious (20%) and lack of time (17%) appear to be the major barriers to behaviour change. Lack of knowledge, lack of support, too difficult or too costly, do not seem to be a prevalent problem for respondents.

## II. Incentives to Lifestyle Change

Respondents believed that lifestyle changes to improve their health would give them satisfaction that they're taking care of their health (71%), have more energy (57%), live longer (56%), look better (48%), save money (23%), make more friends (6%), no response (4%). These beliefs could serve as incentives to promote lifestyle change in a health education program.

## III. Consistency Between Beliefs and Intentions Regarding Behaviour Change

Table 32 illustrates the degree of consistency between what people believe to be a good idea to do to improve their health, and what their intentions are regarding behaviour change in the next 12 months. Although the proportion of the group that actually intend to change their behaviour is about 10% lower than those who hold these beliefs, there was still a fair degree of agreement between the two groups.

Table 32

	Feel it would be a good idea (belief)	Intend to Change in Next 12 Months (Intention)
Exercise more	74	59
Reduce high fat foods	53	44
Lose weight	52	53
Cut down on salt	45	37
Reduce cholesterol	N/A	33
Stop/reduce smoking	34	24
Cut down on alcohol	18	N/A
Other	5	6

Whether people will be successful with their attempts to change behaviour or will act on their intentions is not predictable, however the data show a degree of awareness of lifestyle patterns to improve health (particularly exercise more, lose weight and reduce fat in diet) and a willingness to attempt these behaviours.

#### IV. Personal and Family History of Related Diseases

Table 33 illustrates the personal and family history of respondents for the listed diseases.

Table 33

#### Personal and Family History

<u>Immediate Family (had)</u>	<u>Personal History</u>	<u>Member of Family Died From</u>
<u>N</u>	<u>N</u>	<u>N</u>
Stroke	21	121
High Blood Pressure	243	34
Heart Disease	55	196
Kidney Failure	8	30
Diabetes	43	41

These responses, as all other responses in a mail out questionnaire are subject to recall bias. There does appear however to be a large number of individuals in the community who have had some personal contact with high blood pressure and its effects. This fact may enhance individuals' motivation to learn more about the risk factors for the cardiovascular diseases and how to prevent them. An education campaign should reinforce the link between high blood pressure and stroke, heart and kidney disease.

V. How Do Hypertensives Judge Their Health

How do hypertensives judge their health compared to how non-hypertensives judge their health.

Table 34

	<u>Non-H (in percent)</u>	<u>H</u>
Excellent	20	3
Good	62	49
Fair	16	42
Poor	2	6
	<hr/>	<hr/>
	100%	100%

The hypertensive group perceived their health to be excellent and good less frequently than the non-hypertensive group, and rated their health as fair or poor more often.

VI. Consistency Between Seeing a Doctor and Having Blood Pressure

Checked

Ninety (90) percent of the people who had seen a doctor within the last 12 months (81% of all respondents), also have had their blood pressure checked in that time. This is in accordance with the statement by the Canadian Task Force on Periodic Health Examinations (1979) that blood pressure be screened on all visits to a doctor. Since the majority of people are seeing doctors and getting their blood pressure checked regularly, it seems logical to utilize this encounter better to educate people about hypertension. Males and university graduates have seen a doctor in the last year less frequently than all other subgroups and therefore, alternate strategies are required to reach these groups.

### VII. Hypertensives

Of those who are not currently being treated for high blood pressure, 15% answered that they had been told that they had high blood pressure. These individuals may represent people who are not complying with treatment, were not treated, or blood pressure was temporarily high. Further studies are required to review the hypertensive population in greater detail.

### VIII. Profile of respondent's smoking behaviour:

Fifty-five (55%/N = 505) percent of respondents reported to have smoked cigarettes regularly at one time. Twenty-six (26%/N = 240) percent of respondents smoke regularly now, indicating that 29% of "ever smokers" have been able to quit smoking. Thirty-three percent of the current smokers, smoke 1-10 cigarettes per day, 43% smoke 11-20 cigarettes per day, while 23% smoke 1-2 packages a day. Twenty-four percent of current smokers intend to stop or reduce smoking in the next 12 months to improve their health.

### IX. Regional Distribution of Responses

a) Hypertensives: Distribution of the hypertensive subgroup by region:

Table 35

<u>Region</u>	<u>proportion of total # of hypertensive (%)</u>	<u>proportion of respon- dents that are hyper- tensive</u>
North	10	17.4
South	37	17.1
Winnipeg	53	17.1
	100% (N = 156)	

The majority of the hypertensive subgroup is from the Winnipeg area (53%) while 37% are from the southern region and 10% from the north. The prevalence of hypertensives (as defined for purposes in this study) as a proportion of the total number of respondents in each area is consistent across regions. This prevalence of hypertension may be a high estimate of the provincial prevalence due to the overrepresentation of older subgroups in the survey results.

- b. Knowledge: Comparisons between regions were made for two knowledge questions: What does high blood pressure mean?, and what conditions or symptoms may be caused by high blood pressure? (see Tables 36 and 37).

Table 36

What Does High Blood Pressure Mean? (in percent)

	North	South	Winnipeg
B.P. above normal*	69	81	83
May cause stroke	60	65	66
Hypertension	43	45	49
Related to stress	49	54	60
Danger signal	36	43	48
Not sure	14	8	8

Table 37

What Can High Blood Pressure Cause? (in percent)

	North	South	Winnipeg
Stroke *	71	83	88
Heart problems	71	63	64
Hardening of the arteries	35	30	32
Headache	58	62	55
Dizziness	61	62	57

\* Indicates statistical significance at  $P=.05$

Overall, knowledge was greater in Winnipeg, followed by the Southern region and the North. The North, however, more frequently reported that high blood pressure can cause heart problems (71%) or hardening of the arteries (35%). The people who live in the South most often checked inaccurately that high blood pressure can cause headaches (62%) or dizziness (61%), followed by the North and then Winnipeg.

#### General Knowledge Levels

General knowledge levels (high, moderate, low) were calculated (see Appendix E) by summing the number of answers in the fifteen knowledge questions that were answered correctly by respondents. A high knowledge level was assigned to questions that were answered correctly by 75-100% of all respondents; moderate and low knowledge levels were assigned to questions that were answered correctly by 50-74% and less than 50% of all respondents respectively. The high, medium and low categories were arbitrarily chosen to expedite classification of knowledge levels.

Forty-four percent of all knowledge questions were answered well, indicating high knowledge levels, while 33% were answered moderately well and 22% indicated low knowledge levels. In general, it appears that knowledge of hypertension was moderate-high among respondents, however there also was a considerable degree of misinformation about hypertension. Several important questions were answered poorly (high blood pressure means the same as hypertension, what is normal blood pressure for someone your age, how widespread is the disease and are there signs and symptoms of high blood pressure?).



Table 38 demonstrates the level of knowledge of hypertension in Manitoba (1986) compared to the data from the U.S. National Blood Pressure Surveys. The knowledge level in Manitoba exceeds by far the 1982 U.S. levels for what causes high blood pressure and that high blood pressure causes stroke and kidney problems. The knowledge level for Manitoban's was however lower than the 1982 U.S. level on two questions: "what hypertension means" and "that high blood pressure can cause heart problems".

The U.S. public has shown a steady increase in knowledge since the inception of their National Education Program for high blood pressure.

Table 38

Knowledge of Hypertension in Three U.S. National  
Blood Pressure Surveys and  
The Manitoba Survey  

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(in percent)

<u>Questions</u>	<u>1973</u>	<u>U.S.</u> <u>Survey Year</u>		<u>Manitoba</u> <u>Survey</u>
		<u>1979</u>	<u>1982</u>	
What "hypertension" means	24	32	55	51
What does high blood pressure cause				
(a) stroke	29	38	66	84
(b) heart attack/heart trouble	24	37	77	64
(c) kidney problems	3	11	8	18
What causes high blood pressure				
(a) heredity	7	12	13	42
(b) too much salt	5	12	31	81

Predisposing, Enabling and Reinforcing Factors

The data show that the public is relatively aware of hypertension as a health threat, however their knowledge is clouded by several areas of misinformation (symptoms, possible causes and consequences of high blood pressure). The public's perceptions that hypertension is not a very serious disease and that they are only moderately susceptible to it, in addition to the level of misinformation suggest that a health education program is required in the province. The program should attempt to increase knowledge and clarify perceptions in order to predispose and enable the public to control and prevent hypertension. The majority of respondents felt that there was nothing stopping them from improving their health, most visit a doctor regularly and also believe that most others would approve of their behaviour change. Possibly, the public is lacking the incentives, skills (enabling factors) and a supportive environment (reinforcing factor) to actually alter their overt behaviour.

CHAPTER FIVEDiscussion

This chapter will summarize and discuss the survey results of the Manitoba populations' perceptions, knowledge and behaviour regarding hypertension. The data were collected by a self administered mail out questionnaire which was sent to a random sample of 1500 Manitoba adults (18 years and over). The 925 respondents (a 65.5% response rate) were representative of the Manitoba population for gender, age, educational levels, and regions of the province (north, south and Winnipeg area). As 10% of the data on income were missing, the statistical significance of some relationships involving income may be overestimated. The majority of relationships involving income, coincided with a similar trend in relationships of educational groups. The data were analyzed to test five hypothesis regarding subgroup differences in hypertension knowledge, utilization patterns of sources of health information, perceptions of susceptibility, perceptions of seriousness, and behaviour related to hypertension.

The information in this chapter will be presented in four sections:

Summary of Results

Implications

Recommendations

Conclusions

## Summary of Results

### General Attitudes Towards Health

The majority of respondents described their health in positive terms, with 77% describing their health as excellent or good. This result contrasts with The Active Health Report (Health and Welfare Can., 1986), which found that 61% of Canadians described their health as excellent or very good. A possible explanation for the difference may lie in the fact that the response categories differed between studies; the high end of the response categories for The Active Health Report were very good and excellent, compared to good and excellent in this study. Respondents may have been more willing to report that their health is good versus very good.

Hypertensives were significantly less likely than the total public to see their own health in positive terms (52% reported their health to be good or excellent).

The actual illness experience of the respondents was as follows: 17% were hypertensive, as defined by this study; several reported having had heart disease (6%), diabetes (4.6%), or stroke (2%). In addition to direct experiences with these diseases, many respondents reported that someone in their immediate family had had high blood pressure (51%), heart trouble (31%), a stroke (24%) or kidney failure (6%).

### Information Sources About Health

Nine in ten persons felt that they are able to get the health information that they need. Doctors or clinics were the most utilized sources of health information (75% of all respondents), and also were felt to be the most reliable sources (82%). Hypertensives, females, the

elderly, low income and educational groups rely most heavily on a doctor or clinic for health information. The next three most utilized sources were television public service announcements, television medical information and newspaper health articles. The middle and high income and educational groups rely on television and newspaper for health information more than other groups. Besides being a highly utilized source of health information, television also was perceived to be the second most reliable source (next to doctors and clinics). Newspaper articles and radio were not viewed as reliable as television, doctors, health books or government publications.

Government publications were the tenth most utilized source (22%). Other print material, such as health books (32%) and health magazines (34%) were used for health information more than government publications by all groups. The higher income and educational groups used all forms of print media more than other groups, however they still relied on the television and newspaper more than all other print material. This seems to reinforce the view that while print material is an important adjunct to health education, it cannot be the sole source of information.

#### Perceived Seriousness

Individuals rated the seriousness of various diseases, and high blood pressure was ranked seventh, after lung cancer, stroke, heart condition, kidney trouble, hepatitis and venereal disease. Hypertensives (59%) and people over 65 years of age (57%) rated high blood pressure as being serious more frequently than other groups. This low ranking of hypertension as a serious disease may be associated with the

asymptomatic nature of the disease or with a lack of knowledge of the consequences of high blood pressure and its synergistic effects on risk when combined with smoking and hypercholesterolemia. In either case, the need for education regarding the seriousness of high blood pressure is apparent.

#### Knowledge of High Blood Pressure and Related Disease

Only 51% of the whole group knew that hypertension means the same as high blood pressure, and only 47% knew the reverse to be true. However, almost everyone had at least one experience from which they could have learned about blood pressure: 77% had had their blood pressure checked within the past twelve months. Although knowledge generally increased with education and income, university graduates and males were the least likely of all respondents to have had their blood pressure checked recently.

The respondents think that the major likely causes of high blood pressure were overweight (92%), eating salt (81%), and stress and strain (78%). The high association of stress and strain and high blood pressure may prevent the public from fully comprehending that hypertension exists in people who are not under stress and strain. On the other hand, the association between overweight and salt and high blood pressure could be helpful in reinforcing lifestyle alterations to prevent high blood pressure. Clarification of the possible contributors to the disease should be a part of a health education program.

Eighty-four and 64% of the whole group knew that stroke and heart problems can be caused by high blood pressure. There also was

significant mention of dizziness, headaches and nosebleeds; particularly among females, hypertensives, middle income and education groups. The link between hypertension and stroke and heart disease must be fully appreciated in order to motivate individuals to keep their blood pressure under control. The moderate level of knowledge in the Manitoba population may be clouded by the high level of misinformation.

Ninety-two percent of the general public say that it is likely that someone can have high blood pressure without knowing it. However, "getting dizzy", "flushed", "feeling tired and weak" or "having headaches" were frequently reported as signs of high blood pressure across all subgroups. The public must be convinced of the asymptomatic nature of the disease, and that overt symptoms occur only late in the progress of the disease.

The public is aware that high blood pressure can be controlled with treatment (89%). The following are considered by the respondents to be helpful in treating the disease: a low salt diet, losing weight, reducing stress, regular exercise and quitting smoking (listed in descending order of frequency). The public also is aware that treatment of high blood pressure must continue indefinitely, even if blood pressure gets back to normal (78%).

#### Perceived Susceptibility

Respondents varied in the extent to which they saw themselves as personally susceptible to high blood pressure (45% overall). Having a family history of hypertension seems to increase the perception of personal vulnerability of the disease. Eighty percent of those with a

family history of hypertension perceived themselves to be more susceptible than those without a family history (55%). Despite believing that high blood pressure is a widespread disease (70% overestimated the prevalence), having in many cases a family history of the disease (51% of responders) and feeling somewhat susceptible to it, high blood pressure was not seen as a very serious disease when compared to other diseases. The fact that the majority of respondents (89%) believe that there is an effective treatment for high blood pressure may help to explain this outcome. Lack of knowledge that hypertension can cause heart and kidney disease and stroke also may explain this perception.

#### Behaviour Related to High Blood Pressure

There appears to be some awareness of the lifestyle factors related to high blood pressure and health in general. Approximately 48% of smokers have tried to quit smoking in the past year, and 58% of all respondents (N=925) have tried to change their eating habits in the past year to improve their health.

Those who intend to alter their lifestyle during the next twelve months (n=852) are intending to lose weight (53%), increase physical activity (59%), reduce fat intake (44%) and get their blood pressure checked (40%).

#### Regional Distribution

The highest level of awareness and knowledge about high blood pressure was found in the Winnipeg area, followed by the Southern region and the Northern region. The prevalence of hypertension among the



respondents was approximately 17% for each region. Planning the health education program should involve representatives from all health regions to ensure that consistent messages are distributed throughout the province and not centered in the urban areas.

### The Hypertensive

The hypertensive was more likely than the non-hypertensive to say that they understood the causes, consequences and treatment for high blood pressure, but not to the extent that might have been expected. Eighty-three percent of hypertensives (compared to 85% of non-hypertensives) knew that high blood pressure might cause a stroke, while only 65% knew that it can cause heart trouble. This group was more likely to report that high blood pressure can cause headaches (64%), nosebleeds (43%) and dizziness (62%).

The hypertensive group in this study were hypertensives who were aware of their high blood pressure and also were being treated for it currently. There is likely a group of unaware hypertensives in the population whose knowledge of hypertension is significantly less than the aware hypertensive group in this study. Both of these groups require a high risk strategy which employs educational strategies to promote detection, long term treatment, maintenance, control and recommended lifestyle modifications.

### IMPLICATIONS

The following implications for a health education program are based on the data from this study. The public's knowledge level ranged from moderate to high, however, the survey also identified several areas of

misinformation and gaps in the average person's perceptions of high blood pressure (some of the causes, consequences, symptoms and treatments of the disease).

The public is attuned to some of the factors that have the possibility of lowering high blood pressure (moderation of salt, fat and calorie intake). Taking medicine and reducing smoking were mentioned by fewer respondents than the factors mentioned above. This indicates the need for reinforcement of the importance of taking prescribed medicine and reducing/stopping smoking to control blood pressure. Stress reduction was checked frequently by all subgroups for methods to treat and control blood pressure, and stress also was frequently mentioned as a cause of hypertension. The public strongly associates stress, tension and worry with high blood pressure, a misconception that requires clarification.

Only 33% of all respondents (N=852) who intend to make a life style change to improve their health in the next year, intend to reduce dietary cholesterol. Of those who tried to improve their life style in the past year (N=534), 49% tried to cut down on cholesterol intake. That percentage translates to only 28% of the entire sample (N=925). At a recent conference on Blood Pressure in Los Vegas, U.S.A., elevated serum cholesterol was discussed as the number one risk factor for hypertension (personal communication with Dr. I. MacKenzie; proceedings not yet available). Thus, information about the relationship between serum cholesterol and high blood pressure should be incorporated into the high blood pressure program.

The Canadian Hypertension Society reports that there is not yet good evidence to suggest that acute or chronic stress causes a sustained

elevation in blood pressure (Leenan et al., 1986). Certain characteristics, such as anger and anxiety, combined with a family history of high blood pressure, may make it more likely that a person will display an exaggerated blood pressure response to stress. Thus, according to recent reviews of studies done on the association of stress and high blood pressure (Leenan et al., 1986), stress does not appear to be a primary factor in high blood pressure. However, stress management has been found to benefit hypertensives and perhaps could be a part of the recommended lifestyle in the high risk approach to hypertension. Clarification of the relationship is essential in the general population approach, to alter popular misconceptions about the role of stress in high blood pressure.

High blood pressure was ranked seventh in seriousness compared to other diseases, although the diseases that hypertension can cause were ranked first, second and fourth (stroke, heart conditions and kidney problems). The public must be educated to understand the direct link between controlling hypertension and preventing stroke, kidney and heart disease. The education campaign should involve collaboration with health care professionals to encourage them through professional education to be more explicit in explaining the consequences of high blood pressure to patients, particularly to those who are hypertensive.

While the majority of respondents in every subgroup relied upon a doctor or clinic for health information, there was variation in the utilization of other information sources. A health education program directed at appealing to the general public should note the differences in utilization patterns between groups. Thus a combination of media or "media mix" is indicated since a single uniform approach would fail to make the desired impact.

Almost 80% of all respondents had been to a doctor or clinic within the past year. Doctors' offices or clinics would be excellent sources for the distribution of educational materials for all subgroups, but particularly for the hypertensive, the elderly, the low income and educational groups. These subgroups rely on a doctor or clinic for health information more than on any other information source. Males and individuals with high incomes and/or high educational levels were less likely to have seen a doctor recently. Other highly utilized sources of information by these groups would be required to reach these groups with the educational messages, for example, television and the newspaper.

The promotion of the education program must include all communication channels, particularly television (public service announcements and medical information) and newspaper health articles which are well utilized by all subgroups. Print material (besides newspaper) is a less utilized but important component of the campaign. It would appear to be used most effectively to increase recognition and awareness of the program and the health issue and direct individuals to other educational sources which could provide more detailed information. The print material should be simple, concise and have a readability level at approximately the grade seven or eight level (Blackburn et al., 1984).

Based on the self-report data obtained through this survey, 17% of the study population are current hypertensives. The knowledge level of the hypertensive group was better than the non-hypertensive group overall, however it was not as extensive as might have been expected. Hypertensives have likely had more opportunities than non-hypertensives to learn about high blood pressure through interactions with health care professionals at the time of diagnosis and during follow up visits. Opportunities for educating the public about blood pressure are being missed.

This indicates again that health care professionals and doctors' offices and clinics could be better utilized to promote hypertension detection and control. A high risk strategy which complements the population approach is indicated also.

There appears to be an awareness and knowledge of the lifestyle factors which contribute both to hypertension and other cardiovascular diseases. Many individuals are trying to alter their eating, smoking and exercise behaviour to improve their health. Any program for hypertension prevention and control should provide incentives and messages to motivate people to act and build upon the current level of awareness. Skill development also is an essential phase in a health education program to enable individuals to change their behaviour in the desired direction. Several areas of apparent misinformation became evident from the analysis. Stress, strain and tension are frequently perceived to be a factor in both the cause and control of hypertension. Also, symptoms such as dizziness and headaches were frequently reported as signs of high blood pressure. These perceptions cloud and confuse the knowledge that the population already has acquired and may be a barrier to action. The public's overestimation of the prevalence of hypertension may indicate that individuals believe that most people get high blood pressure as they get older, and that each individual can do little to prevent it. Correct information regarding the prevalence of high blood pressure and clear measures to prevent and control the disease may motivate individuals to take action against high blood pressure.

The respondents reported few potential barriers to behaviour change. The majority claimed that there was nothing stopping them from making improvements in their health, and the remainder did not perceive the problem to be serious, did not want to change current habits or felt that they lacked the time. It appears that an educational program should clarify the health issue to promote a realistic picture of the seriousness of high blood pressure and its consequences. Since the respondents generally feel that there are few barriers to behaviour change, perhaps what they need are motivators or cues to action. The beliefs that were most prevalent among the responders that could serve as incentives for behaviour modification were (in descending order of frequency), improving their health would "give them satisfaction that they were taking care of their health", "have more energy", and "live longer".

In general, the population feels somewhat susceptible to high blood pressure, perceives it to be a widespread disease and many have had contact with high blood pressure either directly or indirectly. The next question then, is what kind of an education program does the population need in order to predispose and enable them to alter their behaviour: get blood pressure checked regularly, modify lifestyle factors that may prevent or control the disease, and comply with treatments. It appears that they lack the following:

Awareness - of the seriousness of the health problem

- of the asymptomatic nature of high blood pressure

(clarify misinformation regarding signs and symptoms)

Knowledge - of the link between heart and kidney disease and stroke, and hypertension

- lifestyle factors which may prevent or control
- the synergistic effect of high blood pressure and smoking, and high serum low density cholesterol levels

Skill - specific actions to take to reduce risk

Motivation- decrease perceived barriers to behaviour change and provide incentives for behaviour modification

Support - structures within the personal and social environments to support healthy lifestyles

Consequently, to predispose and enable individuals to reduce the conditions that may leave them at risk of hypertension, and it's negative health outcomes, the major educational goals of a public education program should be to increase knowledge of:

- a) the nature of high blood pressure as an asymptomatic and chronic disease
- b) the seriousness of it's health threat if uncontrolled
- c) the importance of early recognition and treatment
- d) the lifestyle measures that help prevent and control high blood pressure; including modification of other cardiovascular risk factors.

The behavioural goals should be to increase:

- e) skills to achieve the recommended lifestyle.
- f) actions necessary to find out one's blood pressure and maintain healthy blood pressure.
- g) appropriate treatment and follow-up of identified hypertensives.

In addition to the goals listed above to predispose and enable the individual to modify behaviour, a professional education program should have the goal of educating health professionals to support and motivate individuals' health behaviour.

### Recommendations

The education program for the primary and secondary prevention of hypertension should involve a combined high risk and population approach. The high risk strategy attempts to identify, control or prevent disease among those with high risk levels and those with overt hypertension. The population approach employs strategies for the reduction of the major precursors of hypertension in the whole population (Blackburn, 1980). An environment which is supportive of the recommended changes that individuals must make, is essential for both approaches.

Approaches should be developed to change behaviour in both the individual and social system as a whole. These two levels of each community (micro and macro levels) are closely interrelated and impact on one will affect the other. Behaviour at the social level will affect individual behaviour and decision making, and conversely the behaviour of a group of individuals can produce social system changes (Rogers and Shoemaker, 1971).

A health education program for hypertension should have three major components (Blackburn, 1984):

1. Direct education - to expose people to health information which could lead to health action.



2. Education through media - mass campaigns to alert the population to the seriousness of the health problem and legitimize the program. This step requires planning with local councils to make campaigns community specific.

To be most effective, the communication channel should be appropriate for the audience and for the educational strategy, that is, mass media for increasing awareness and knowledge, and motivating action. Meyer et al. (1980) report that media alone can influence health behaviour, but when it is supplemented with direct communication, there is the potential for a longer lasting effect on knowledge and behaviour modification. Therefore media campaigns should guide audiences to the direct education programs.

Television public service announcements, television medical information and newspaper health articles were highly utilized source of information in all subgroups, and should be primary media sources for the program. However, reinforcement of messages can be orchestrated through the use of multiple media sources or "media mix" (McGuire, 1981).

3. Community organization - involves opinion leaders and community representatives from every facet of the community (education, business, health services, volunteer organizations) to serve as planners, consultants and role models. Community organization seeks to establish a permanent framework for an ongoing community prevention and control program. External efforts are necessary in the beginning of the program, to facilitate the formation of new organizations and/or the coordination of existing health promotion and

service groups that are able to develop and maintain programs on their own (Rothman, 1968). Community organization is essential to provide a supportive environment to enable individuals to maintain behaviour change. For example, Iacono et al., (1984) suggest that in addition to requiring reliable information, the public would need changes in food and nutrition policies to provide a supportive environment for behaviour change. Standards for product content and labelling may be legislated, however industry and government would likely require persuasion and assurance that consumers both desire and would use the regulation to their benefit.

Health education campaigns are a series of related activities designed to bring about a particular result, and involves the cyclical planning and allocation of resources. The staging of a program may be sequenced according to the same six steps that were utilized in this study as guidelines for database collection. The steps are listed as follows: (described in detail in Chapter 2; page 33).

1. awareness
2. knowledge
3. motivation
4. skills
5. action
6. maintain

The first three steps are intermediate steps in an individuals' decision making process, which may predispose overt behaviour change. The four final steps are required to enable and reinforce the behaviour so that it can be maintained.

It is difficult to attribute increases in awareness solely to a promotion campaign, particularly as the program is adopted by voluntary,

public and private agencies. Evaluation methods such as baseline data and periodic monitoring through custom or omnibus surveys can track sequential changes and compare them to pre-program benchmarks. Evaluation is an important part of program planning and implementation and Blackburn (1980) states that program phasing can sharpen evaluation. Possible evaluation criteria that could be appropriate at progressive points throughout the implementation may be as follows:

- proportion of population exposed to message
- proportion of population aware of message
- proportion of target with correct perception of message
- proportion of target with desired change in attitude
- number who adopt desired behaviour
- number who maintain behaviour change

Parcel (1984) recommends the use of the PRECEDE framework (Green and Iverson, 1982) to assist researchers to categorize the gaps in knowledge and skills that can be targeted by the program, and to identify the needs for research.

As this study examined data on Manitoba adults (18 years and over) further research is recommended to study the blood pressure knowledge, beliefs and behaviours in school age children, ages 6-17 years. Programs to educate this age group about normal blood pressure and how to prevent high blood pressure are important components in the primary prevention of hypertension.

Consistency of the messages and campaigns across all ages and population subgroups is important because each segment contributes to community norms and values. Over a period of time, it should become socially acceptable and expected that everyone in the community knows their own blood pressure. Although the educational messages are to be consistent, the promotional tools, media and distribution channels may

vary between subgroups. Certain "target groups" in the population may require specific educational strategies. For example, isolated groups in society like the elderly, the unemployed and single mothers need to receive the same messages as the rest of society, but through different distribution channels and information sources.

The involvement of schools (Kolbe and Newman, 1984), continuing education programs, medical schools and other professional training institutions may be an important way of socializing communities to a cardiovascular disease prevention "norm".

A high risk strategy is essential to promote the detection, treatment and control of the high risk group. Hypertensives and groups that are at a higher risk of developing hypertension (for example, low income groups) would be the target audience of the high risk approach. People with low incomes, including the unemployed, those on welfare, single parents, senior citizens, and some racial minority groups have a higher prevalence of high blood pressure, in addition to having a lower life expectancy and greater disability (Health and Welfare Canada, 1986).

Collaboration with representatives of all health care professions, business and industry would facilitate a unified approach and would enable educational programs to be promoted in places where hypertensives congregate, for example worksites and doctors' offices. Alderman et al., (1983) and Logon et al., (1981) report that worksite programs have been effective in lowering blood pressure. Sexton et al., (1985) found that in comparison with treatment in the community, hypertensives were more likely to have their blood pressure detected, treated and controlled in a worksite program.

Doctors, doctors' offices, and medical clinics could be better utilized in distributing health information, particularly for the subgroups in the population which rely most heavily on a doctor or clinic for health information (for example, people over 65 years of age, hypertensives, and low income groups).

Professional education is essential to educate and encourage health professionals to maximize on all opportunities to educate the public about high blood pressure. For example, approximately three-quarters of the sample in the study had been to see a doctor in the past year, however only about one-half of the group knew that high blood pressure and hypertension meant the same thing. It appears that opportunities to educate the public about high blood pressure are being missed.

Communication is essential for social change (Rogers and Shoemaker, 1971). Rogers and Shoemaker (1971) define social change as a process by which alteration occurs in the structure and function of a social system. An example of this may be lifestyle modification by both individuals and the social system to reduce the prevalence of hypertension and its' negative health outcomes. They refer to a "diffusion effect" which is a threshold of twenty or thirty percent of awareness and knowledge in the population, beyond which there is adoption of overt behaviour. In Manitoba, the level of awareness and knowledge of hypertension is at the level beyond which the diffusion effect should occur. However, in accordance with other researchers in community behaviour change (Farquhar, 1984; Blackburn, 1984), Rogers and Shoemaker (1971) reinforce the need for the sequential transmission of educational messages over a long period of time (several years as in the

case of Participaction) to allow for the time lags in diffusion between the introduction of a new idea to its' widespread adoption. To predispose, enable and reinforce individuals to make the recommended behaviour changes, the program must provide messages that will facilitate their progression through the six sequential steps mentioned above. The public education program should reinforce what the public already knows, however a major emphasis of the program should be to clarify the issues about which the public is confused. In addition to increasing knowledge and clarifying perceptions, a critical component of both the population approach and the high risk approach should be to increase skills, motivation and provide the necessary supports to maintain behaviour change.

#### CONCLUSIONS

The purpose of this study was to collect baseline data which would segment the Manitoba population and test hypothesis regarding blood pressure, knowledge, perceptions and behaviours. The results showed that in general, the knowledge level was moderate-high, however, this level appears to be clouded by a high level of misinformation. The public seems to be aware of hypertension as a health issue, but does not perceive it to be a very serious disease. Clarification of the link between high blood pressure and its negative health outcomes is essential.

The respondents varied in the extent to which they utilized sources of health information. Overall, doctors offices or clinics were the most utilized sources of health information, while television and the

newspaper were the next most utilized sources, followed by radio and the various print media. The result demonstrated the need for multiple education strategies and a "media mix" to communicate the educational messages to all subgroups in the population.

In general, the high income and educational groups, hypertensives and people in the Winnipeg area had higher knowledge levels of hypertension than other subgroups. However, with the exception of increasing physical fitness and trying to lose weight, those with higher educational levels or income, or those under 35 years of age had actually changed/or intended to change their lifestyle to improve their health less than other subgroups. The public needs incentives and a supportive environment to promote overt behaviour change.

A population approach should be employed, with special attention given to differing educational needs and preferred information sources. A high risk approach that is compatible with the population approach should target those with hypertension (aware and unaware) and those in the high risk category, to promote detection, long term treatment, maintenance and control.

In conclusion, the study results indicated the need for a community health promotion program to predispose, enable and reinforce individuals in Manitoba to reduce the conditions leaving them at risk for hypertension. Since the ultimate aim of hypertension prevention and control is the reduction in the incidence of premature death and disability due to cardiovascular disease, the hypertension education program should be sub-program of a comprehensive risk reduction program.

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APPENDIX A

**The University of Manitoba Research Ltd.**

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**HIGH BLOOD PRESSURE SURVEY**

**The University of Manitoba**

**Winnipeg, Manitoba R3T 2N2**

THIS SURVEY TAKES APPROXIMATELY 10 TO 15 MINUTES TO COMPLETE.  
PLEASE COMPLETE IT NOW AND DROP IT INTO THE MAIL.

WHO ARE WE?

The University of Manitoba Research Ltd. - Social Science Division is located in the Faculty of Arts at the University of Manitoba. It engages in social science research and undertakes such investigation for a number of government and community agencies. This survey is being conducted on behalf of the Manitoba Heart Foundation.

WHAT IS THIS SURVEY FOR?

Health and wellness is a concern for all of us. This questionnaire is designed to provide the Manitoba Heart Foundation with information on Manitoba peoples' beliefs, perceptions and behaviour related to high blood pressure. Your responses will help in developing future health education programs in Manitoba.

WHAT WILL BE DONE WITH THE QUESTIONNAIRES?

The information will be placed on computer tape, and once we have checked to see if this recording was correctly done, this questionnaire will be destroyed. All survey research at the University of Manitoba is governed by an ethics review board to protect your privacy. ALL OF THE INFORMATION YOU GIVE US IS confidential.

WHY SHOULD I ANSWER?

We know that you are busy and that many people seem to be asking you questions and invading your privacy. However, your opinions are valuable in order for the Manitoba Heart Foundation to develop effective health programs for the province.

THE NUMBER ON THE FRONT OF THE QUESTIONNAIRE SERVES TO ENSURE THAT WHEN YOU REPLY YOU ARE NOT CONTACTED ON FOLLOW-UP MAIL-OUTS. WE HAVE NO INFORMATION, ASIDE FROM YOUR NAME AND ADDRESS, IN ADDITION TO WHAT YOU PROVIDE IN THIS QUESTIONNAIRE.

**SECTION I** First, we would like to get some information on your health attitudes and practices.

1. Compared to people your own age, how would you judge your own health? Would you say it is:

- EXCELLENT .....
- GOOD .....
- FAIR .....
- POOR .....
- NOT SURE .....

2. Do you agree or disagree with the following statement? "Compared to most people my age, I make more of an effort to improve my health".

- AGREE .....
- DISAGREE .....
- NOT SURE .....

1. Do you feel that it would be a good idea to do any of the following to improve your health? Check as many items as apply to you.

- DO NOT NEED TO DO ANYTHING .....
- EXERCISE MORE .....
- CUT DOWN ON SALT .....
- CUT DOWN ON HIGH FAT FOODS .....
- LOSE WEIGHT .....
- STOP SMOKING .....
- CUT DOWN ON ALCOHOL .....
- OTHER (SPECIFY) \_\_\_\_\_

Are you attempting to make any of these improvements?

- YES .....
- NO .....



**SECTION II** In this section we would like to find out from what sources you receive health information.

7. Are you able to find out what you need to know about health care?

YES ..... \_\_\_\_\_

NO ..... \_\_\_\_\_

8. Below are listed several ways that people find out about health and medical care. Please check each of the sources from which you personally get information.

PUBLIC SERVICES MESSAGES ON T.V.  
(FOR EXAMPLE, FROM THE HEART  
FOUNDATION ON EXERCISE) ..... \_\_\_\_\_

PUBLIC SERVICE MESSAGE ON RADIO .... \_\_\_\_\_

HEALTH ARTICLES IN NEWSPAPER ..... \_\_\_\_\_

MEDICAL INFORMATION ON T.V. .... \_\_\_\_\_

MEDICAL INFORMATION ON RADIO ..... \_\_\_\_\_

PUBLIC HEALTH NURSE ..... \_\_\_\_\_

YOUR OWN DOCTOR OR CLINIC WHERE  
YOU GET MEDICAL CARE ..... \_\_\_\_\_

GOVERNMENT PUBLICATIONS ON HEALTH ... \_\_\_\_\_

PEOPLE AT WORK ..... \_\_\_\_\_

FRIENDS/NEIGHBOURS/RELATIVES ..... \_\_\_\_\_

HEALTH BOOKS ..... \_\_\_\_\_

HEALTH INFORMATION TELEPHONE LINE ... \_\_\_\_\_

HEALTH INFORMATION FROM MAGAZINES ... \_\_\_\_\_

9. Please write down the three (3) sources which you feel would be the most reliable sources for health information.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION III** This section asks questions about your personal knowledge, beliefs and practices related to high blood pressure.

12a. Many people have different ideas about what high blood pressure means. Please check the following terms that describe what "high blood pressure" means to you.

- HEART WORKING HARDER/PRESSURE ON THE HEART ..... \_\_\_\_\_
- BLOOD PRESSURE ABOVE NORMAL ..... \_\_\_\_\_
- DANGER SIGNAL ..... \_\_\_\_\_
- MAY CAUSE STROKE ..... \_\_\_\_\_
- RELATED TO STRESS ..... \_\_\_\_\_
- TROUBLE WITH HEART ..... \_\_\_\_\_
- TOO MUCH BLOOD TO HEAD ..... \_\_\_\_\_
- GETTING DIZZY ..... \_\_\_\_\_
- HYPERTENSION ..... \_\_\_\_\_
- POOR CIRCULATION ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

12b. Who can have high blood pressure? Check as many as apply.

- CHILDREN ..... \_\_\_\_\_
- ANYONE ..... \_\_\_\_\_
- MAINLY WOMEN ..... \_\_\_\_\_
- MAINLY MINORITIES ..... \_\_\_\_\_
- MAINLY MEN ..... \_\_\_\_\_
- MAINLY FAT PEOPLE ..... \_\_\_\_\_
- MAINLY OLD PEOPLE ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

13. How often should the average person have their blood pressure checked?

- ONCE A YEAR ..... \_\_\_\_\_
- TWICE A YEAR ..... \_\_\_\_\_
- EVERY 2 YEARS ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

14a. When did you last have your blood pressure checked?  
Was it:

- WITHIN THE LAST 6 MONTHS ..... \_\_\_\_\_
- 7-12 MONTHS AGO ..... \_\_\_\_\_
- 1-2 YEARS AGO ..... \_\_\_\_\_
- 3-5 YEARS AGO ..... \_\_\_\_\_
- MORE THAN 5 YEARS AGO ..... \_\_\_\_\_
- HAVE NOT HAD BLOOD PRESSURE  
CHECKED ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

14b. What was your blood pressure when it was last checked? \_\_\_\_\_  
DON'T KNOW ..... \_\_\_\_\_

15. Have you ever been told that you have high blood pressure?

- YES ..... \_\_\_\_\_
- NO ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

16. Are you currently being treated for high blood pressure?

- YES ..... \_\_\_\_\_
- NO ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

17. What is considered normal blood pressure for someone your  
age? Please check only one answer..

- 90/60 MM HG. .... \_\_\_\_\_
- 130/50 MM HG. .... \_\_\_\_\_
- 160/80 MM HG. .... \_\_\_\_\_
- 120/80 MM HG. .... \_\_\_\_\_
- 140/100 MM HG. .... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

18. Where can a person go to have their blood pressure checked as many as apply.

- A DOCTOR'S OFFICE ..... \_\_\_\_\_
- PUBLIC HEALTH OFFICE ..... \_\_\_\_\_
- EMERGENCY ROOM AT A HOSPITAL ..... \_\_\_\_\_
- OTHER (SPECIFY) \_\_\_\_\_

19. Following is a list of some conditions and symptoms. Please check the ones that you think are frequently caused by high blood pressure.

- STROKE ..... \_\_\_\_\_
- NOSE BLEEDS ..... \_\_\_\_\_
- DIABETES ..... \_\_\_\_\_
- ANEMIA ..... \_\_\_\_\_
- KIDNEY TROUBLE ..... \_\_\_\_\_
- EYE PROBLEMS ..... \_\_\_\_\_
- HEADACHE ..... \_\_\_\_\_
- HEART PROBLEMS ..... \_\_\_\_\_
- PNEUMONIA ..... \_\_\_\_\_
- SWELLING ..... \_\_\_\_\_
- DIZZINESS ..... \_\_\_\_\_
- ARTHRITIS ..... \_\_\_\_\_
- HARDENING OF THE ARTERIES ..... \_\_\_\_\_

20. As far as you know, is there any treatment for high blood pressure?

- YES ..... \_\_\_\_\_
- NO ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

21. From the following list, please check the measures that you think would help control high blood pressure. Check as many as apply.

- DIETING TO LOSE WEIGHT ..... \_\_\_\_\_
- TAKING MEDICINE ..... \_\_\_\_\_
- REGULAR EXERCISE ..... \_\_\_\_\_
- LOW SALT DIET ..... \_\_\_\_\_
- RESTING A LOT ..... \_\_\_\_\_
- JOGGING ..... \_\_\_\_\_
- LOW FAT DIET ..... \_\_\_\_\_
- STOPPING SMOKING ..... \_\_\_\_\_
- REDUCING STRESS ..... \_\_\_\_\_
- STOP DRINKING ALCOHOL ..... \_\_\_\_\_
- SEEING A PSYCHIATRIST OR PSYCHOLOGIST ..... \_\_\_\_\_

22. For each of the following, please check the items that you think can lead to high blood pressure. Check as many as apply.

- COFFEE ..... \_\_\_\_\_
- OVERWEIGHT ..... \_\_\_\_\_
- OLD AGE ..... \_\_\_\_\_
- LACK OF EXERCISE ..... \_\_\_\_\_
- EATING SALT ..... \_\_\_\_\_
- RACE OR ETHNIC ORIGIN ..... \_\_\_\_\_
- HEREDITY ..... \_\_\_\_\_
- EATING FATTY FOODS ..... \_\_\_\_\_
- SHOKING ..... \_\_\_\_\_
- STRESS, STRAIN ..... \_\_\_\_\_
- ALCOHOL ..... \_\_\_\_\_
- LOW INCOME ..... \_\_\_\_\_
- BEING PREGNANT ..... \_\_\_\_\_

23. Do you feel that it is likely that you might some day develop high blood pressure?

- YES ..... \_\_\_\_\_
- NO ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

24. How widespread do you believe high blood pressure is? Check one.

- UNDER 10% OF THE POPULATION ..... \_\_\_\_\_
- 10-20% OF THE POPULATION ..... \_\_\_\_\_
- 20-40% OF THE POPULATION ..... \_\_\_\_\_
- 40-60% OF THE POPULATION ..... \_\_\_\_\_

25. How can someone tell when their blood pressure is high? Check as many as apply.

- FAINTING SPELL ..... \_\_\_\_\_
- GO TO A DOCTOR/NURSE ..... \_\_\_\_\_
- FEEL PRESSURE IN CHEST ..... \_\_\_\_\_
- GET DIZZY ..... \_\_\_\_\_
- HAVE HEADACHES ..... \_\_\_\_\_
- GET FLUSHED ..... \_\_\_\_\_
- FEEL NERVOUS ..... \_\_\_\_\_
- VISION AFFECTED ..... \_\_\_\_\_
- TIRED AND WEAK ..... \_\_\_\_\_
- CANNOT TELL ..... \_\_\_\_\_
- OTHER (SPECIFY) \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

26. If a person with high blood pressure gets their blood pressure down to normal, are they cured (as one gets over a cold)? Or must they stay on some type of treatment?

- USUALLY CURED ..... \_\_\_\_\_
- STAY ON TREATMENT ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

27. Is it likely that someone can have high blood pressure without knowing?

- YES ..... \_\_\_\_\_
- NO ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

28. What does the word "hypertension" mean? Please check the items that describe what you think hypertension means.

- BAD NERVES ..... \_\_\_\_\_
- NERVOUS CONDITION ..... \_\_\_\_\_
- HIGH BLOOD PRESSURE ..... \_\_\_\_\_
- TOO MUCH TENSION, PRESSURE ..... \_\_\_\_\_
- OVEREXCITED ..... \_\_\_\_\_
- OVERACTIVE ..... \_\_\_\_\_
- OTHER (SPECIFY) \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

29. Who can have hypertension? Check as many as apply.

- CHILDREN ..... \_\_\_\_\_
- ANYONE ..... \_\_\_\_\_
- MAINLY MEN ..... \_\_\_\_\_
- MAINLY MINORITIES ..... \_\_\_\_\_
- MAINLY FAT PEOPLE ..... \_\_\_\_\_
- MAINLY OLD PEOPLE ..... \_\_\_\_\_
- MAINLY NERVOUS PEOPLE ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

30. If you knew someone with any of the following conditions, would you think it was serious or not serious? Please indicate your opinion for each of the following condition on a scale of 1 to 5 where 1 is not serious and 5 is very serious.

	NOT SERIOUS			VERY SERI	
	1	2	3	4	5
LUNG CANCER	1	2	3	4	5
A STROKE	1	2	3	4	5
A HEART CONDITION	1	2	3	4	5
DIABETES	1	2	3	4	5
HIGH BLOOD PRESSURE	1	2	3	4	5
KIDNEY TROUBLE	1	2	3	4	5
VENEREAL DISEASE	1	2	3	4	5
HEPATITIS	1	2	3	4	5
STOMACH ULCERS	1	2	3	4	5
BACK TROUBLE	1	2	3	4	5
A BLADDER INFECTION	1	2	3	4	5



QUESTION IV Now we would like to ask you about your lifestyle. Lifestyle refers to choices that you make regarding your health; for example, foods you eat, leisure activities, smoking, etc.

Have you ever smoked cigarettes regularly?

YES ..... \_\_\_\_\_

NO (IF NO, GO TO Q32) ..... \_\_\_\_\_

Do you smoke cigarettes now?

YES (IF YES, GO TO Q31d) ..... \_\_\_\_\_

NO ..... \_\_\_\_\_

IF NO, How long ago did you quit? \_\_\_\_\_ YEARS AGO

GO TO QUESTION 32.

IF YES, About how many cigarettes a day do you smoke now?

1-5 CIGARETTES ..... \_\_\_\_\_

6-10 CIGARETTES ..... \_\_\_\_\_

11-20 CIGARETTES ..... \_\_\_\_\_

OVER 1 AND UP TO 2 PACKS ..... \_\_\_\_\_

OVER 2 PACKS ..... \_\_\_\_\_

Have you tried to stop smoking during the past 12 months?

YES ..... \_\_\_\_\_

NO ..... \_\_\_\_\_

Have you been told to stop smoking for health reasons by a health professional?

YES ..... \_\_\_\_\_

NO ..... \_\_\_\_\_

32a. During the past 12 months, have you tried to change eating habits in any way?

YES .....

NO (IF NO, GO TO Q32c) .....

32b. IF YES, Did you try to: (Please check as many items apply to you.)

LOSE WEIGHT .....

CUT DOWN ON TABLE SALT .....

CUT DOWN ON SALT IN COOKING .....

CUT DOWN ON FATTY FOODS .....

CUT DOWN ON FOODS WITH HIGH CHOLESTEROL LEVELS .....

OTHER (SPECIFY) .....

32c. Do you think you should try to change any of your eating habits for your health?

YES .....

NO .....

NOT SURE .....

33. Do you intend to alter some aspect of your lifestyle in the next 12 months? Please check the ones that you intend to change.

LOSE WEIGHT .....

CHANGE YOUR DIET:

BY REDUCING FAT INTAKE .....

BY REDUCING SALT INTAKE .....

BY REDUCING CHOLESTEROL .....

INCREASE PHYSICAL ACTIVITY .....

STOP OR REDUCE SMOKING .....

GET BLOOD PRESSURE CHECKED .....

OTHER (SPECIFY) .....

34. Would you agree or disagree with the following statement:  
"Most people who are important to me think I should change  
some aspect of my lifestyle to improve my health."

- AGREE ..... \_\_\_\_\_
- DISAGREE ..... \_\_\_\_\_
- NOT SURE ..... \_\_\_\_\_

35. If I changed my lifestyle to improve my health, I would:  
(Check as many as apply to you.)

- LOOK BETTER ..... \_\_\_\_\_
- LIVE LONGER ..... \_\_\_\_\_
- SAVE MONEY ..... \_\_\_\_\_
- MAKE MORE FRIENDS ..... \_\_\_\_\_
- HAVE MORE ENERGY ..... \_\_\_\_\_
- FEEL SATISFIED THAT I'M TAKING  
CARE OF MY HEALTH ..... \_\_\_\_\_
- EXPERIENCE NO CHANGE ..... \_\_\_\_\_

36a. Would any of the following people approve of your making  
lifestyle changes to improve your health? Check the people  
that would approve.

- SPOUSE ..... \_\_\_\_\_
- FAMILY ..... \_\_\_\_\_
- CO-WORKERS ..... \_\_\_\_\_
- BOSS ..... \_\_\_\_\_
- OTHER (SPECIFY) \_\_\_\_\_
- NO ONE ..... \_\_\_\_\_

36b. Would any disapprove of your making lifestyle changes to  
improve your health? Check the people that would  
disapprove.

- SPOUSE ..... \_\_\_\_\_
- FAMILY ..... \_\_\_\_\_
- CO-WORKERS ..... \_\_\_\_\_
- BOSS ..... \_\_\_\_\_
- OTHER (SPECIFY) \_\_\_\_\_
- NO ONE ..... \_\_\_\_\_

37. Do any of the following people think you should alter lifestyle to improve your health? Please check as many as apply.

- SPOUSE ..... \_\_\_\_\_
- FAMILY ..... \_\_\_\_\_
- CO-WORKERS ..... \_\_\_\_\_
- BOSS ..... \_\_\_\_\_
- OTHER (SPECIFY) \_\_\_\_\_
- NO ONE ..... \_\_\_\_\_

**SECTION V** In this last section, we would like to ask some questions about your health and your family's health.

38a. Aside from yourself, has any member of your immediate family (parents, spouse, brothers, sisters, children), ever had any of the following? (Grandparents are not counted as immediate family.) Please check as many as apply.

- STROKE ..... \_\_\_\_\_
- HIGH BLOOD PRESSURE ..... \_\_\_\_\_
- HEART DISEASE ..... \_\_\_\_\_
- KIDNEY FAILURE ..... \_\_\_\_\_
- DIABETES ..... \_\_\_\_\_

38b. Have you had any of the following:

- STROKE ..... \_\_\_\_\_
- HIGH BLOOD PRESSURE ..... \_\_\_\_\_
- HEART DISEASE ..... \_\_\_\_\_
- KIDNEY FAILURE ..... \_\_\_\_\_
- DIABETES ..... \_\_\_\_\_

38c. Has any member of your immediate family died from any of the following?

- STROKE ..... \_\_\_\_\_
- HIGH BLOOD PRESSURE ..... \_\_\_\_\_
- HEART DISEASE ..... \_\_\_\_\_
- KIDNEY FAILURE ..... \_\_\_\_\_
- DIABETES ..... \_\_\_\_\_

Finally, we need to ask you some background questions. This information makes sure our sample is representative of Manitobans.

39a. What is your present marital status? Are you:

- SINGLE ..... \_\_\_\_\_
- MARRIED ..... \_\_\_\_\_
- COMMON-LAW ..... \_\_\_\_\_
- SEPARATED ..... \_\_\_\_\_
- DIVORCED ..... \_\_\_\_\_
- WIDOWED ..... \_\_\_\_\_
- OTHER (SPECIFY) \_\_\_\_\_

39b. Are you a:

- STUDENT ..... \_\_\_\_\_
- HOUSEWIFE ..... \_\_\_\_\_
- RETIRED PERSON ..... \_\_\_\_\_
- UNEMPLOYED PERSON ..... \_\_\_\_\_
- SELF-EMPLOYED ..... \_\_\_\_\_
- SALARIED WAGE EARNER ..... \_\_\_\_\_
- HOURLY WAGE EARNER ..... \_\_\_\_\_

40. What is the highest grade or year of school you compl \_\_\_\_\_

GRADE 1-6 ..... \_\_\_\_\_

GRADE 7-9 ..... \_\_\_\_\_

GRADE 10-12 ..... \_\_\_\_\_

TECHNICAL/VOCATIONAL TRAINING ... \_\_\_\_\_

SOME UNIVERSITY TRAINING ..... \_\_\_\_\_

UNDERGRADUATE UNIVERSITY DEGREE \_\_\_\_\_

POSTGRADUATE UNIVERSITY DEGREE .. \_\_\_\_\_

41. What is your sex?

MALE ..... \_\_\_\_\_

FEMALE ..... \_\_\_\_\_

42. In what year were you born? \_\_\_\_\_

3. What is your ethnic origin?

- BRITISH (including Irish,  
Scottish, & Welsh) ..... \_\_\_\_\_
- FRENCH ..... \_\_\_\_\_
- PORTUGUESE ..... \_\_\_\_\_
- UKRAINIAN ..... \_\_\_\_\_
- ITALIAN ..... \_\_\_\_\_
- GERMAN ..... \_\_\_\_\_
- HUNGARIAN ..... \_\_\_\_\_
- POLISH ..... \_\_\_\_\_
- JEWISH ..... \_\_\_\_\_
- SCANDINAVIAN ..... \_\_\_\_\_
- INDO/PAKISTANIAN ..... \_\_\_\_\_
- DUTCH ..... \_\_\_\_\_
- CZECH ..... \_\_\_\_\_
- JAPANESE ..... \_\_\_\_\_
- CHINESE ..... \_\_\_\_\_
- NATIVE INDIAN ..... \_\_\_\_\_
- RUSSIAN ..... \_\_\_\_\_
- PACIFIC ISLANDER ..... \_\_\_\_\_
- CANADIAN ..... \_\_\_\_\_
- AMERICAN ..... \_\_\_\_\_
- METIS ..... \_\_\_\_\_
- AFRICAN ..... \_\_\_\_\_
- AUSTRIAN ..... \_\_\_\_\_
- FILIPINO ..... \_\_\_\_\_
- MENNONITE ..... \_\_\_\_\_
- YUGOSLAVIAN ..... \_\_\_\_\_
- WEST INDIAN ..... \_\_\_\_\_
- OTHER (SPECIFY) \_\_\_\_\_

44. How many people, including yourself, live in your household? .....

45. For statistical purposes we need to know your total household income for 1985. Please check the line which best represents all the money all members of your household earned or received (before taxes).

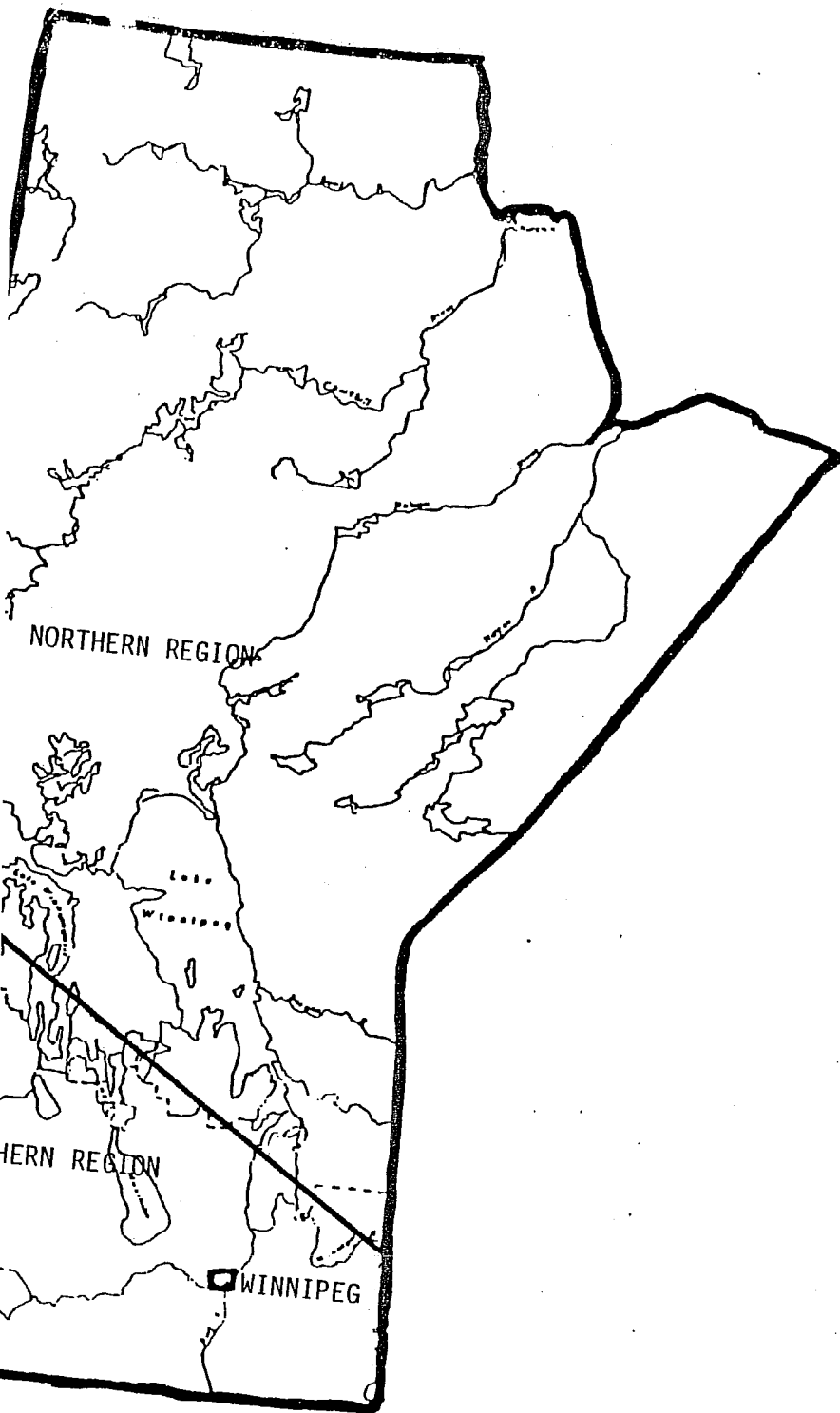
- UNDER \$10,000 .....
- \$10,000 - \$20,000 .....
- \$20,000 - \$35,000 .....
- \$35,000 - \$50,000 .....
- OVER \$50,000 .....

46. Please indicate the region of the province in which you live, (using the division indicated on the map as a guide

- Northern Region .....
- Winnipeg Region .....
- Southern Region .....

Thank you for taking the time to complete this questionnaire.  
Your help is much appreciated.





Social Sciences Division  
University of Manitoba Research Ltd.

October, 1986

Dear Sir/Madam:

The subject of health is of concern to all of us. National health and medical groups are increasingly directing their attention to preventative programs in order to raise the level of awareness among the general public about life-threatening illnesses, and the effects of lifestyle on our health.

The Manitoba Heart Foundation is one of those groups who develop health education programs intended to promote the control and prevention of cardio-vascular diseases.

You are one of 1500 Manitobans randomly selected from all areas of the province to participate in a study about high blood pressure. The study has been designed to provide the Manitoba Heart Foundation with information on peoples' beliefs, perceptions and behaviour related to high blood pressure. Your responses will help in developing health education programs in the future.

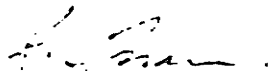
The study, which is sponsored by the Manitoba Heart Foundation, is being conducted by the University of Manitoba Research Ltd. All survey research done at this university is governed by the Ethics Review Committee. All information you give us is CONFIDENTIAL. Your identity will be revealed to no one and the Heart Foundation will not receive any material which will allow identification of any participant. Once the material is transferred to a computer file, the enclosed questionnaire will be destroyed. The computer file will contain no information that allows individuals to be identified.

The questionnaire takes approximately 10 to 15 minutes to complete. A stamped self-addressed envelope is enclosed for your convenience in returning your responses to our office. We realize that people lead busy lives and that surveys are sometimes an interruption, but your responses are valuable and we would request your assistance in this study.

If you have any questions, please call the University of Manitoba Ltd., Social Sciences Division, at 269-5528 or 474-9118.

Your cooperation is greatly appreciated.

Yours truly,



Ms. Judith Froese  
Project Manager  
Encl.

Two weeks ago, a questionnaire seeking your attitude and beliefs about high blood pressure was mailed to you. Your name was drawn from a random sample of Manitobans over the age of 18.

Since the questionnaire takes only 10 or 15 minutes to complete, we would greatly appreciate your taking the time to complete it now and drop it into the mail.

If by chance you did not receive the questionnaire, or if it was misplaced, please call me collect and I will forward another one to you immediately. If you have already sent in the questionnaire, allow me to thank you again.

Thank you for your cooperation.

Ms. Judith Froese  
Project Manager

269-5528

APPENDIX D

December, 1986

Dear Sir/Madam:

One month ago, a questionnaire seeking your attitude and beliefs about high blood pressure was mailed to you. Your name was randomly selected as one of 1500 Manitobans being contacted and asked to participate in this study.

As indicated in our previous letter, the Manitoba Heart Foundation is sponsoring the study in order to better determine Manitobans' beliefs and understanding of high blood pressure. Therefore, when future health awareness and education programs are developed by the Foundation, they will more accurately reflect the needs of Manitobans.

Your participation is important. All information you give us is confidential. Your identity will be revealed to no one and the Heart Foundation will not receive any material which will allow identification of any individual.

In the event that the previously mailed questionnaire was misplaced, we are enclosing another copy for you. It takes approximately 10 to 15 minutes to complete. A stamped self-addressed envelope is enclosed for your convenience in returning your response to our office. We hope you will assist us in this important research.

If you have any questions, please call the University of Manitoba Research Ltd., Social Sciences Division at 269-5528 or 474-9118. If you have already mailed your completed questionnaire, thank you again for your participation.

Yours truly,

Ms. Judith Froese  
Project Manager  
Encl.

Appendix E  
Hypertension Knowledge Levels

KEY - Knowledge Level

High (H) - 75-100% of respondents answered variable correctly  
 Moderate (M) - 50-74% of respondents answered variable correctly  
 Low (L) - less than 50% answered correctly

Question	Correct Answer	Knowledge Level (H.M.L.)	Associated Misinformation
What does high blood pressure (HBP) mean?	Hypertension (47%)	L	Get dizzy (37%) Related stress (57%)
Who can have HBP?	Anyone (86%)	H	Mainly fat people (26%)
How often should BP be checked?	At least once a year (97%)	H	
What was your BP when last checked?	17% knew words (H,M,L) 20% knew numbers ranging from 80/120 to 225/185 mm.Hg.	L	Did not know (60%)  No response (3%)
What is normal blood pressure?	120/80 mm.Hg. (28% of all respondents)	L	
What conditions can HBP cause?	Stroke (84%) Kidney Disease (18%) Heart Problems (65%)	H L M	Nosebleeds (43%) Headache (58%) Swelling (18%) Dizziness (59%)
Is there a treatment for HBP?	Yes (90%)	H	
What measures can help control HBP?	Lose Weight (82%) Take Medicine (74%) Regular Exercise (75%) Low Salt Diet (87%) Low Fat Diet (69%) Stop Smoking (73%)	H M H H M M	Reduce Stress (75%)

Question	Correct Answer	Knowledge Level (H.M.L.)	Associated Misinformation
What can lead to HBP?	Overweight (92%)	H	Coffee (38%)
	Eat too much salt (81%)	H	Lack of Exercise (62%)
	Fatty foods (72%)	M	Stress & Strain (78%)
	Smoking (66%)	M	
	Alcohol (54%)	M	
How can you tell if your BP is high?	Doctor/nurse (69%)	M	Feel nervous (23%)
	cannot tell (11%)	L	Feel tired & weak (32%)
			Flushed (41%)
			Fainting Spell (31%)
			Dizzy (56%)
			Have a headache(52%)
How widespread is HBP?	10-20% of population (25%)	L	Less than 10% of population (4%) 20-40% "" (49%) 40-60% "" (22%)
Must you stay on treatment when BP gets back to normal?	Yes (78%)	H	
What does hyper-tension mean?	High Blood Pressure (51%)	M	Too much tension (48%) Nervous condition (30%) Overexcited (29%) Overactive (20%)
Who can have HBP?	Anyone (85%)	H	Mainly children(48%) Mainly fat people (10%) Mainly nervous people (16%)
Can a person have HBP without knowing it?	Yes (78%)	H	
<b>TOTALS</b>			
15 questions	27 correct variables		

High knowledge level - 12 variables (44.4%)  
Moderate knowledge level - 9 variables (33.3%)  
Low knowledge level - (22.2%)