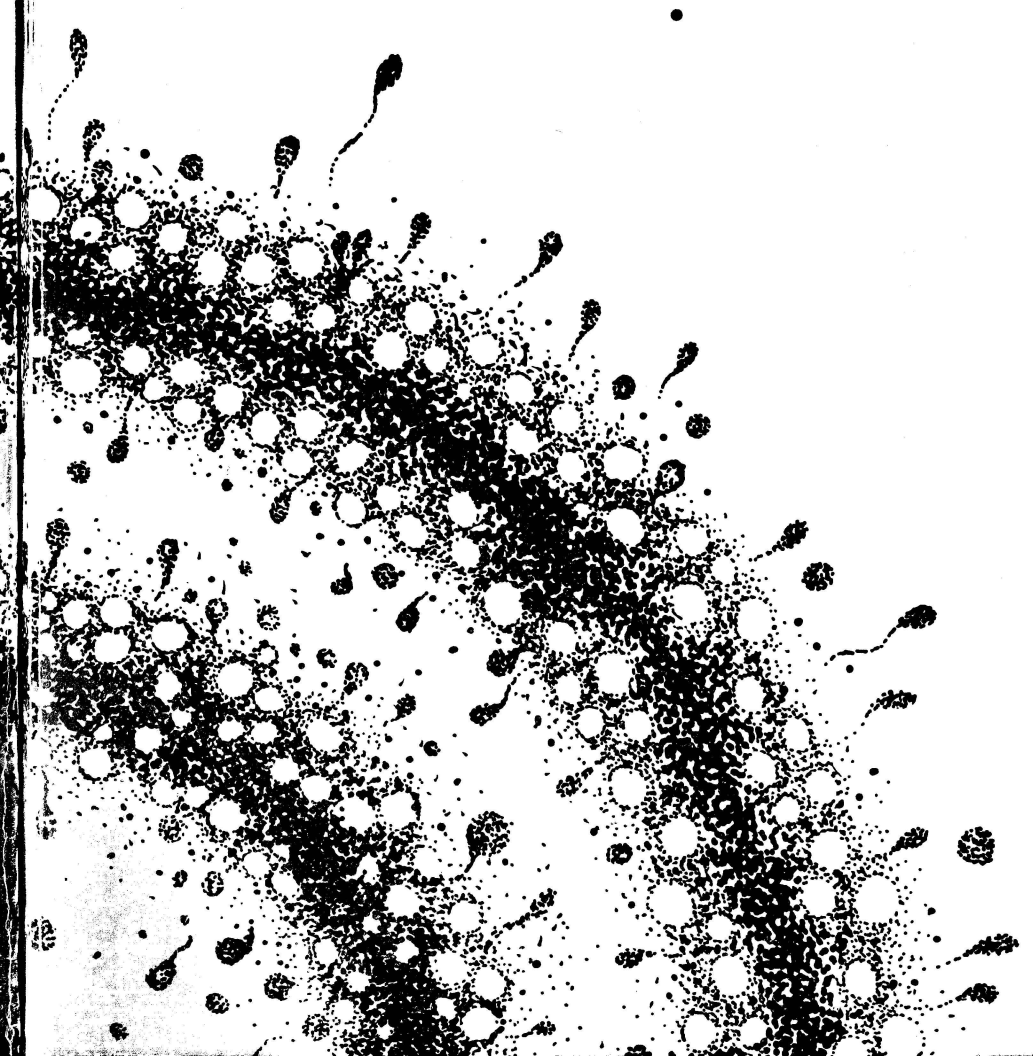
nutrition canada

indian survey



NUTRITION CANADA

THE INDIAN SURVEY REPORT

A REPORT FROM NUTRITION CANADA

BY THE BUREAU OF NUTRITIONAL SCIENCES

Department of National Health and Welfare

Published by authority of

The Honourable Marc Lalonde

Minister of National Health and Welfare

1975

ACKNOWLEDGEMENTS

The planning and conduct of Nutrition Canada and the production of data from the survey reflect the cooperation of many individuals and groups not directly employed by Nutrition Canada.

We acknowledge the cooperation of the staff of Statistics Canada who participated in the survey design and selected the sample and the Department of Indian and Northern Affairs who provided listings of individuals in the Reserves surveyed. Among the staff of National Health and Welfare we are particularly indebted to the nutritionists and nurses from Medical Services, upon whom we were very much dependent for facilities and over-all response. They visited selected persons in their homes, arranged for their transportation and greatly facilitated the collection of data.

We are grateful to all who made Nutrition Canada possible, particularly those persons who so generously attended the survey and provided the information we sought.

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PREFACE

The need for comprehensive information on the nutritional status of Canadians has been recognized for many years. The widely held assumption that Canadians are well nourished has been questioned in scientific literature. Recent changes in life style and accompanying changes in food habits have intensified the need to analyze nutritional health on a national scale. Nutrition Canada was designed to determine the nutritional status of Canadians according to region, population type, income, season and physiological group.

The planning and organization of the survey began in 1969. Data and samples for biochemical analysis were collected between September 1970 and December 1972 and laboratory work was completed by spring 1973. The results have been partially compiled and analyzed, and an overview of the national findings was released by Nutrition Canada in November 1973 *(Nutrition Canada National Survey).*

This detailed report for Indians, prepared by the Bureau of Nutritional Sciences, is one of a group of simultaneously prepared reports providing data and interpretation of the results for each province, and for Indians and for Eskimos. Data relevant to a province or ethnic group are presented along with the corresponding data for the national sample, which in turn are derived from the results of all 10 provinces (not including Indian and Eskimo results).

The information in these reports will provide a scientific basis for further research, for modifying legislation regarding addition of nutrients to foods, and for planning future public health and nutrition education programs.

Separate reports on dental health, anthropometry, income relationships, food consumption patterns, and other special aspects of the survey will be published in the future.

CHAPTER 1 – MEASUREMENT OF NUTRITIONAL STATUS

Events which lead to malnutrition are sequential: inadequate nutrient intakes cause biochemical disturbances and, after long periods of time, clinical signs of malnutrition. The measurement of nutritional status, therefore, involves a combination of dietary, biochemical and clinical methods, each of which has certain values and limitations to be considered in the interpretation of survey results.

1.1 DIETARY

Dietary data collected in a survey provide information concerning nutrient intakes and dietary patterns. The collection of data is a difficult task requiring a high degree of cooperation from each participant. The validity of the information collected is affected by a number of factors. Bias may be introduced by failure to recall some foods and by incorrect descriptions of the type and amount of food consumed. Inaccuracies in the calculated nutrient content may occur due to the use of average values from tables of food composition.

In the Nutrition Canada survey, dietary data were collected by the 24-hour recall method, the most practical method for a large-scale survey. This method is not applicable for individual assessment because foods consumed on one day may not necessarily represent foods consumed on other days. However, by combining the data for individuals, it is possible to compare the distribution of intakes for groups of persons having the same age and sex.

1.2 BIOCHEMICAL

Biochemical measurements are useful in predicting the risk of nutritional deficiency because biochemical changes may precede the appearance of clinical abnormalities and often provide the most quantitative assessment of nutritional status. In a survey, biochemical tests are usually done on blood and urine samples. Specimens are preferably obtained from fasted individuals to minimize the effects of very recent food intake, but this is not practicable in a large-scale survey.

Levels of some metabolites and vitamins, such as ascorbic acid, in serum reflect recent nutrient intake, whereas low levels of others, for example, vitamin A, indicate when the nutrient reserves have been exhausted, after long periods of nutrient deprivation.

Urinary levels of some nutrients, such as riboflavin and thiamin, also reflect recent dietary intakes. When the intakes of these nutrients are above body needs, the required amount is retained and the amount in excess is excreted in the urine. Ideally all the urine excreted over a 24-hour period should be collected. This is not feasible in a large survey, so one casual sample of urine is collected and the concentration of the metabolite is expressed relative to that of creatinine. As individuals with similar physique and body weight excrete approximately the same amount of creatinine in the urine every 24 hours, the ratio of metabolite to creatinine is roughly proportional, in each physiological group, to the total daily excretion of the metabolite.

1.3 CLINICAL

In a survey, the clinical examination is general in nature, noting the signs most commonly associated with malnutrition. Particular attention is given to the skeletal structure, eyes, lips, tongue, neck, skin and neurological functioning of the lower limbs.

Severe deficiency states, with pronounced physical signs, such as kwashiorkor and beriberi, are usually found only in the developing countries. In Canada the prevalence of severe deficiencies would be expected to be low. In mild-to-moderate deficiency states, physical signs are often non-specific but provide clues to the existence of mild deficiency diseases. Many signs are also caused by non-nutritional factors, such as environmental conditions, heredity or metabolic disorders. The association of clinical findings with biochemical and dietary data can be especially useful in confirming specific nutrient deficiencies.

Obesity, on the other hand, is readily discernible in a physical examination. The extent and magnitude of obesity can be determined by anthropometric measurements such as skin-fold thicknesses, height and weight.

CHAPTER 2 – SAMPLE DESIGN AND RESPONSE

Nutrition Canada designed the survey[a] to provide estimates of nutritional characteristics in the following populations:

1. the residents of the 10 provinces, excluding Indians on reserves and persons living in institutions and military camps;

2. Indians in bands on reserves and crown lands in the provinces and Territories;

3. Eskimos living in four settlements in the Territories.

Separate sample designs were developed for each of these population groups.

2.1 INDIANS IN BANDS ON RESERVES AND CROWN LANDS

Sample Design

Nutrition Canada designed the Indian segment of the survey to assess nutritional status according to region, distance from urban centres, and cultural area. The Indians were grouped into six regions as follows:

1. Maritime (Prince Edward Island, New Brunswick, and Nova Scotia);

2. Quebec;

3. Ontario;

4. Prairie (Manitoba, Saskatchewan, and Alberta);

5. British Columbia;

6. Yukon and Northwest Territories.

Within each region, Statistics Canada identified areas close to urban centres and areas remote from urban centres. Generally, close areas

[a] cf. Carson, E.M. and M.S. Nargundkar. The National Nutrition Survey (Nutrition Canada). *Canadian Statistical Review*. May 1972. p. 4.

were in the southern parts of the provinces; remote areas were in the north. All areas in the Maritimes were close to urban centres; all in the Territories were remote.

Indian and Northern Affairs defines six Indian culture areas in Canada: Algonkian, Iroquoian, Mackenzie River, Plains, Plateau, and Pacific. In recognition of cultural differences, Statistics Canada selected bands representative of each culture area.

Regions, distance from urban centres, and cultural areas combined produced 13 strata.

Nutrition Canada selected the sample in two stages: bands from each stratum, and members from the selected bands. Table 2-1 gives the bands surveyed.

Indian and Northern Affairs supplied lists of bands for each of the 13 strata. Bands of fewer than 150 persons were combined with a nearby band in the same stratum to form a single sampling unit. Thus, each unit contained a minimum of 150 people. At least two such units were selected in each stratum. In all, 29 band units participated in the survey.

The Department of Indian and Northern Affairs supplied a list of members of each selected band and a sample of participants was selected from each band. The sampling procedure insured that all the age-sex categories shown in Table 2-2 would be represented equally. The oldest age group for the Indian sample is 55 years and over, rather than 65 years and over as in the national survey. This recognizes that the Indian population has a lower proportion of persons 65 years of age and over.

The target sample size was 80 persons from each of the 29 band units, a total of 2,320 persons. To compensate for anticipated non-response, Nutrition Canada selected additional persons from each band unit. Participants selected in the above manner constituted a probability sample.

The sample included a small number of pregnant women selected from each band by the local health authorities. Because of the mode of selection of these individuals, they were not intended to constitute a probability sample.

TABLE 2-1

INDIAN BANDS SURVEYED BY NUTRITION CANADA

BAND NAME AND PROVINCE	CULTURE AREA
St. Mary's, New Brunswick	Algonkian
Pictou Landing, Nova Scotia	Algonkian
Iroquois of Caughnawaga, Quebec	Iroquoian
Hurons of Lorette, Quebec	Iroquoian
Romaine, Quebec	Algonkian
Fort George, Quebec	Algonkian
Curve Lake, Ontario	Iroquoian
Oneidas of the Thames, Ontario	Iroquoian
Chippewas of Rama, Ontario	Algonkian
Nipissing, Ontario	Algonkian
Moose Factory, Ontario	Algonkian
Pikangikum, Ontario	Algonkian
Sioux Valley, Manitoba	Plains
Pequis, Manitoba	Plains
Fisher River, Manitoba	Plains
Cowessess, Saskatchewan	Plains
Lac La Ronge, Saskatchewan	Plains
Stoney Rapids, Saskatchewan	Plains
Enochs, Alberta	Plains
Canim Lake, British Columbia	Plateau
Okanagan, British Columbia	Plateau
Necoslie, British Columbia	Plateau
Bella Bella, British Columbia	Pacific
Sheshaht, British Columbia	Pacific
Chemaninas, British Columbia	Pacific
Seabird Island, British Columbia	Pacific
Whitehorse, Yukon Territory	Plateau
Fort Smith, Northwest Territories	Mackenzie River
Yellowknife, Northwest Territories	Mackenzie River

2.2 RESPONSE

The Indian survey was conducted between September 1971 and September 1972. Table 2-2 gives the number of persons selected for the survey and the number of persons who attended the survey centres.

A large number of Indians selected could not be contacted so that only 30% of the persons initially selected participated in the survey.

Females had a higher response rate than males. Men 20 through 39 and children 0 through 4 years of age had the lowest response rates. The highest rates were among children 5 through 9 years of age and among persons over the age of 54.

TABLE 2-2

THE TOTAL NUMBER OF INDIANS SELECTED FOR THE NUTRITION CANADA SURVEY AND THE TOTAL NUMBER OF INDIANS WHO ATTENDED THE SURVEY CENTRES

PHYSIOLOGICAL GROUP	TOTAL SELECTED[a]	TOTAL ATTENDED[b]								
		Algonkian	Iroquoian	Plains	Plateau	Pacific	Mackenzie River	TOTAL CLOSE	TOTAL REMOTE	TOTAL
0 through 4 yrs M & F	473	60	21	47	46	23	7	101	103	204
5 through 9 yrs M & F	373	66	35	66	31	38	10	120	126	246
10 through 19 yrs M	478	45	37	35	37	40	10	121	83	204
10 through 19 yrs F	474	60	41	66	49	44	13	147	126	273
20 through 39 yrs M	507	34	17	25	29	26	7	77	61	138
20 through 39 yrs F	509	57	25	37	33	36	9	100	97	197
40 through 54 yrs M	425	37	18	42	15	21	0	71	62	133
40 through 54 yrs F	385	40	32	57	25	19	7	97	83	180
55 yrs + M	423	18	19	43	13	18	5	61	55	116
55 yrs + F		23	14	32	17	21	10	59	58	117
TOTAL	4,047	440	259	450	295	286	78	954	854	1,808
Pregnant Women		14	3	20	8	5	2	15	35	50

[a] Includes persons who could not be contacted.

[b] Includes volunteers who were not selected.

CHAPTER 3 – SURVEY PROCEDURES

The Nutrition Canada survey team, which consisted of a physician, nurses, nutritionists, a dental hygienist, laboratory technologists and support staff, surveyed most Indian reserves close to urban centres. The Nutrition Canada northern survey team, which consisted of a physician, a nurse, nutritionists, laboratory technologists, and support staff, surveyed most Indian reserves remote from urban centres. The physician in the northern team was also trained in Ottawa to conduct the dental examination. Every member of both teams was specially trained in collecting, interpreting and recording data, and frequent checks during the survey operations assisted in maintaining uniform standards. Translators were used where necessary, mainly in remote areas, and were briefed to familiarize themselves with the interview questionnaires. In Ottawa, Nutrition Canada operated a laboratory and data processing was provided by the Statistics and Information Science Division.

Before the survey, an advance team, accompanied by staff members of the local public health units, visited the selected participants in their homes and explained the tests and interviews. During this visit, basic demographic data and information on food buying and food preparation were recorded. In the surveys of Indian and Eskimo populations, public health nurses for each district, in place of the regular advance party, visited homes.

At the survey centre, each participant was given a clinical, anthropometric and dental examination and a dietary interview; and blood and urine samples were collected. The examinations were held Monday through Friday, usually from 1:00 p.m. until 10:00 p.m.

3.1 DIETARY INTERVIEW

The participants were not informed beforehand of the nature of the dietary interview so that they would not deviate from their usual eating habits. Experienced interviewers asked each participant to recall all the foods and beverages consumed on the previous day.

The interviewer assisted the recall by encouraging a review of the previous day's activities. Portion-size models, designed specially for the survey, were used to define objectively the quantities of the foods consumed. The intake of vitamin and mineral supplements was included as part of the dietary record.

Information on children under 12 years of age was obtained from their mothers, or from adults responsible for their meals. Children 6 to 12 years of age participated in the interviews.

3.2 CLINICAL EXAMINATION

The medical staff interviewed the participants and documented their medical history, including present and past illnesses, major surgical operations and the use of medications. Information was collected about smoking habits and women were questioned about their reproductive history. Parents supplied information concerning their children, including details of eating patterns during infancy, histories of contagious diseases and other health problems. The physician performed a general physical examination, noting particularly abnormalities which could be caused by nutrient deficiencies. People with medical problems that required immediate attention were referred to the local public health unit.

An anthropometrist recorded 14 measurements, including height and weight, chest and shoulder width, and skin-fold thicknesses.

3.3 DENTAL EXAMINATION

The dental examination included a review of recent use of dental services. The examiner recorded details of the status of first and permanent teeth and assessed each tooth as decayed, missing or filled. The examiner also assessed the condition of the gums and underlying supporting structures, the amount of debris on the surface of the teeth, the accuracy of the "bite" and the need, fit and function of dentures.

3.4 BIOCHEMICAL TESTS

At each survey centre, laboratory equipment was set up for the collection and initial processing of blood and urine samples. Determinations of hemoglobin level and hematocrit in blood, and tests for the presence of glucose (Clinistix[a]) and albumin (Albustix[a]) in the urine were made in the survey centre laboratory.

The clotted blood samples were centrifuged immediately to obtain the serum. A stabilizing solution was added to a portion of the serum for later determination of vitamin C, and the urine samples were acidified. All samples were frozen after this initial processing, packed in dry ice, and forwarded to the central laboratory in Ottawa.

[a] Registered trademark reagent strips manufactured by Ames Chemical, Division of Miles Laboratories Ltd., Rexdale, Ontario.

3.5 *CENTRAL LABORATORY*

The central laboratory received the samples usually within 72 hours of collection. The laboratory staff checked the samples for over-all physical quality and stored them at minus 15° Centigrade until the biochemical tests could be performed. The stability of the factors being measured determined the order in which the analyses were conducted. The vitamin C determinations, for example, were always completed within three weeks of collection.

Biochemical determinations included: serum analyses for total protein, iron, transferrin saturation, folate, calcium, phosphorus, vitamin A, vitamin C, cholesterol, vitamin E, alkaline phosphatase, albumin, and triglycerides; and urine analyses for creatinine, thiamin, riboflavin and iodine. Table 3-1 lists the methods for the biochemical tests.

Most biochemical determinations were carried out with automated analytical equipment. Several conventional manual methods were adapted and improved. The accuracy of the results was monitored daily by control procedures.

The participant and family doctor were advised by letter when the biochemical tests indicated a need for medical treatment.

3.6 *DATA PROCESSING CENTRE*

The data processing centre developed a quality control system to minimize errors in the data. For example, the forms collected by the team were reviewed manually before the information was transferred to punch cards and magnetic tape, and the data in the computer were checked against the original forms from the team and the central laboratory.

Food composition tables from the United States Department of Agriculture[b] formed the basis for computer computation of the nutrient intakes from dietary records. Nutrition Canada nutritionists modified the tables for foods enriched according to Canadian regulations and added nutrient content data for some convenience foods and wild game that were not included in the U.S. publications. The contributions of mineral and vitamin supplements were included in the calculation of the nutrient intakes.

[b] Watt, Bernice K. and others. *Composition of Foods.* Washington, D.C., Agricultural Research Service, U.S. Department of Agriculture, 1963. (Handbook No. 8).

TABLE 3-1

METHODS FOR BIOCHEMICAL TESTS

Hemoglobin	Laboratory Centre for Disease Control, Department of National Health and Welfare, Canada. Manual of Clinical Chemistry. Blood Hemoglobin Method Hem-1. Revised January 8, 1962.
Hematocrit	Clay Adams. Instruction Autocrit Centrifuge No. 0571, 1970.
Total Protein	Beckman Instruments, Inc. DSA 560 Discrete Sample Analyser, Procedure 83929-A: Total Protein. Modified procedure of Henry, R.J., Sobel, G. and S. Berkman. *Anal. Chem.* 29:1491. 1957.
Iron **Transferrin Saturation**	Pelletier, O., Verdier, P. and G. Pelletier. Serum Iron and Unsaturated Iron Binding Capacity Procedures for the Beckman DSA 560 Discrete Sample Analyser. Modified procedure of Goodwin, J.F., Murphy, B. and M. Guillemette. *Clin. Chem.* 12:47. 1966. Unpublished data.
Folate	Pelletier, O., Ahmad, A.U. and C. Nantel. A Microbiological Assay for Folate in Serum. Modifications of Difco Procedure: Folic Acid Determination in Body Fluids, Difco Laboratories, Sept. 1970; and the procedure of Sauberlich, H.E. and G.F. Herman. Private Communication 1969. Unpublished data.
Calcium	Pelletier, O., Verdier, P. and G. Pelletier. Serum Calcium Procedure for the Beckman DSA 560 Discrete Sample Analyser. Modifications of the procedures of Kessler, G. and M. Wolfman. *Clin. Chem.* 10:686. 1964; Gitelman, H.J. *Anal. Biochem.* 18:521. 1967, and Technicon AutoAnalyser Method N-3b 1/11, 1965. Unpublished data.

Phosphorus

Pelletier, O., Verdier, P. and G. Pelletier. Serum Inorganic Phosphorus Procedure for the Beckman DSA 560 Discrete Sample Analyser. Adaptation of Monitor Phosphorus Procedure. Monitor Product Information 1969, p. 12 and Fiske-Subbarow Method. *J. Biol. Chem.* 66:375. 1925. Unpublished data.

Vitamin A

Thompson, J.N. and others. Fluorometric determination of vitamin A in human blood and liver. *Biochem. Med.* 5:67. 1971.

Vitamin A

Vitamin E

Thompson, J.N., Erdody, P. and W.B. Maxwell. Simultaneous fluorometric determinations of vitamins A and E in human serum and plasma. *Biochem. Med.* 8:403. 1973.

Vitamin C

Pelletier, O. and R.A. Brassard. New automated method for serum vitamin C. Advances in Automated Analysis, 1972 Technicon International Congress. *Pharmaceutical Sciences.* 9:73. Tarrytown, N.Y., Mediad Inc., 1973.

Cholesterol

Technicon Corporation. Cholesterol (Direct). Technicon AutoAnalyser Method N-77 1/11, 1969.

Alkaline Phosphatase

Pelletier, O., Verdier, P. and G Pelletier. Serum Alkaline Phosphatase Determination with the Beckman DSA 560 Discrete Sample Analyser. Modifications of the procedure of Morgenstein, S. and others. *Clin. Chem.* 11:889. 1965, and of Technicon AutoAnalyser Method N-6b 1/11, 1969. Unpublished data.

Albumin

Beckman Instruments, Inc. DSA 560 Discrete Sample Analyser, Procedure 83934-A: Albumin (HBABA). Modified procedure of Martinek, R.G. *Clin. Chem.* 11:441. 1965.

Triglycerides

Pelletier, O. and R. Madère. Serum Triglycerides by Automated Flow-Through Analysis. Adaptation of the procedure of Levy, A.L. and C. Keyloun. Advances in Automated Analysis,

1970. Technicon International Congress. 1:497. 1971, and the procedure of Royer, M.E. and H. Ko. *Anal. Biochem.* 29:405. 1969. Unpublished data.

Creatinine

Pelletier, O., Verdier, P. and R. Brassard. Automated Procedure for Determining Urine Creatinine. Modifications of Technicon AutoAnalyser Method N-11b, 1965. Unpublished data.

Thiamin

Pelletier, O: and R.A. Madère. New automated method for measuring thiamine (vitamin B_1) in urine. *Clin. Chem.* 18:937. 1972.

Riboflavin

Pelletier, O. and R. Madère. Automated Determination of Riboflavin (vitamin B_2) in Urine. Advance in Automated Analysis, 1970. Technicon International Congress. 11:413. Miami, Florida, Thurman Associates, 1971.

Iodine

Pelletier, O. and R.G. Klassen. Direct Determination of Urinary Iodine by Automated Flow-Through Analysis. Modifications of procedure of Garry, P.T. Private Communication 1972. Unpublished data.

CHAPTER 4 – THE INTERPRETATION OF DATA

4.1 STATISTICAL INTERPRETATION

The selection of the participants is described fully in Chapter 2. The sample has a complex relationship with the actual population and some groups are over-represented relative to others. To provide unbiased estimates of the prevalence in each population the method of weighted estimation was used. With the exception of pregnant women, who did not constitute a probability sample, all of the estimates presented in this report are weighted. As a consequence of this weighting, the percentages in the tables of results are not a simple fraction of the number of persons used in calculating the estimate.

The size of the sample is provided because it indicates the precision of the estimate. In the probability sampling technique, the precision improves as the sample size increases.

The distribution tables include estimates of the medians and other percentiles. Median intakes rather than means are used to summarize graphically the distributions of dietary intakes since medians are less influenced by the extreme values which occur sporadically in asymmetric distributions.

National estimates are included in bar graphs next to the provincial estimates. The national estimates include the provincial data and hence are correlated. Furthermore, the estimates for the more populated provinces will tend to be more highly correlated with the national estimates than will estimates from the less populated provinces. More accurate inferences about a province's standing in the nation may be obtained by comparing individual provinces. The national and Indian or Eskimo estimates are not correlated since the national estimate does not include the Indian or Eskimo data.

Data for the 0 through 4 year group were subdivided in the national sample into two groups (under 1 year and 1 through 4 years). Because of the smaller sample sizes for the provincial, Eskimo and Indian surveys, this breakdown was not possible. Biochemical determinations presented in this report for infants under 1 year only include those for which a small quantity of blood was required, i.e., hemoglobin, MCHC and hematocrit.

4.2 NUTRITION CANADA INTERPRETIVE STANDARD

In 1969, a Committee on Standards and Data Interpretation developed a standard for the interpretation of the Nutrition Canada data. Originally the standard included risk classifications, intended to indicate the

probability of nutritional disease, for the biochemical, antropometric and clinical findings.

In this report, the use of the risk classifications is limited to the biochemical and anthropometric findings. These are classified into three risk groups as follows:

High Risk	– a high probability that a nutritional problem exists;
Moderate Risk	– an average probability that a nutritional problem is present or developing;
Low Risk	– a low probability that a nutritional problem exists.

Two anthropometric measurements, height and weight, were used in the calculation of the Ponderal Index, which can be used to screen for the risk of mortality associated with overweight. In the *Nutrition Canada National Survey,* Ponderal Index values were classified into only two risk categories (high and low risk). In this report, an additional classification of moderate risk is given to expand and clarify the findings.

Nutrient intakes are classified into three levels, with corresponding cut-off points, designated as follows:

Inadequate Intakes	– those below minimum requirements; but below adequate intakes;
Marginal Intakes	– those above minimum requirements
Adequate Intakes	– those providing a desirable measure of safety in meeting the requirements for a nutrient.

In this report the distributions of the nutrient intakes are tabulated and the median intakes are assessed using the above classifications.

For a variety of reasons, which are described fully in Chapter 15, the clinical signs are interpreted independently.

Interpretive Standard for Pregnant Women

Subsequent to the publication of the *Nutrition Canada National Survey* (November 1973), errors were discovered in the data concerning pregnant women. All of these errors involved the special interpretive standards which were prescribed for certain nutrient intakes and biochemical tests in pregnant women in their second and third trimesters. During the initial computation of the results, the standards were applied in error only to women in the third trimester; the remaining pregnant women were assessed on the basis of the interpretive standards for non-pregnant women.

In the revision of the data, it was considered desirable to exclude women in the first trimester altogether as none of the prescribed standards were appropriate for this stage. When the proper standards were applied to women in the second trimester, considerably lower prevalences of abnormal serum protein and serum hemoglobin values were found among pregnant women than indicated in the previously published national report.

NUTRITION CANADA
INTERPRETIVE STANDARD

A. BIOCHEMICAL DATA	RISK CATEGORIES		
	HIGH	MODERATE	LOW
TOTAL SERUM PROTEIN[1,2] (g/100 ml)			
0-5 mos M & F	-	-	-
6-71 mos M & F	below 5.0	5.0 - 6.0	above 6.0
6+ yrs M & F	below 6.0	6.0 - 6.4	above 6.4
Pregnant Women[a]	below 5.5	5.5 - 6.0	above 6.0
HEMOGLOBIN[1,2] (g/100 ml)			
0-1 yr M & F	below 9.0	9.0 - 10.0	above 10.0
2-5 yrs M & F	below 10.0	10.0 - 11.0	above 11.0
6-12 yrs M & F	below 10.0	10.0 - 11.5	above 11.5
13-16 yrs M	below 12.0	12.0 - 13.0	above 13.0
13-16 yrs F	below 10.0	10.0 - 11.5	above 11.5
17+ yrs M	below 12.0	12.0 - 14.0	above 14.0
17+ yrs F	below 10.0	10.0 - 12.0	above 12.0
Pregnant Women[a]	below 9.0	9.0 - 10.5	above 10.5
MCHC(%)[b,3,4]			
All ages M & F	below 30	30 - 32	above 32
SERUM TRANSFERRIN[c,2,5] (% saturation)			
All ages M & F	below 16	16 - 20	above 20
SERUM FOLATE[6] (ηg/ml)			
All ages M & F	below 2.5	2.5 - 5.0	above 5.0
SERUM VITAMIN A[1] (μg/100 ml)			
All ages M & F	below 10	10 - 30	above 30
SERUM CALCIUM (mg/100 ml)			
All ages M & F	below 9	-	9 and above

a Second and third trimesters of pregnancy.

b $\frac{\text{Hemoglobin (g/100 ml)}}{\text{Hematocrit (\%)}} \times 100$

c $\frac{\text{Serum Iron}}{\text{Total serum iron binding capacity}} \times 100$

A. BIOCHEMICAL DATA	RISK CATEGORIES		
	HIGH	MODERATE	LOW
SERUM PHOSPHORUS (mg/100 ml)			
0-4 yrs M & F	below 4	-	4 and above
COMBINED CLASSIFICATION SERUM CALCIUM SERUM PHOSPHORUS (vitamin D deficiency rickets)	Ca below 9 P below 4	Ca below 9 P 4 and above or	Ca 9 and above P 4 and above
0-4 yrs M & F		Ca 9 and above P below 4	
SERUM VITAMIN C[7,8,9,10] (mg/100 ml)			
0-19 yrs M & F	below 0.2	0.2 - 0.6	above 0.6
20+ yrs M & F	below 0.2	0.2 - 0.4	above 0.4
SERUM CHOLESTEROL[11] (mg/100 ml)			
20-21 yrs M & F	above 220	-	220 and below
22-39 yrs M	above 240	-	240 and below
22-39 yrs F	above 220	-	220 and below
40-64 yrs M	above 250	-	250 and below
40-64 yrs F	above 230	-	230 and below
65+ yrs M & F	above 250	-	250 and below
URINARY THIAMIN[1,2,5] (μg/g creatinine)			
0-2 yrs M & F	below 120	120 - 170	above 170
3-5 yrs M & F	below 85	85 - 120	above 120
6-8 yrs M & F	below 70	70 - 180	above 180
9-12 yrs M & F	below 60	60 - 180	above 180
13-16 yrs M & F	below 50	50 - 150	above 150
17+ yrs M	below 40	40 - 120	above 120
17+ yrs F	below 30	30 - 100	above 100
URINARY RIBOFLAVIN[1,2,5] (μg/g creatinine)			
0-2 yrs M & F	below 150	150 - 500	above 500
3-5 yrs M & F	below 100	100 - 300	above 300
6-8 yrs M & F	below 85	85 - 270	above 270
9-16 yrs M & F	below 70	70 - 200	above 200
17+ yrs M & F	below 30	30 - 80	above 80
URINARY IODINE[12] (μg/g creatinine)			
All ages M & F	below 50	-	50 and above

B. NUTRIENT INTAKES	CLASSIFICATION OF INTAKES		
	INADEQUATE	MARGINAL	ADEQUATE
PROTEIN (g/kg body weight/day)			
0-5 mos M & F	below 2.0	2.0 - 2.5	above 2.5
6-11 mos M & F	below 1.2	1.2 - 1.8	above 1.8
1-2 yrs M & F	below 0.9	0.9 - 1.6	above 1.6
3-8 yrs M & F	below 0.7	0.7 - 1.3	above 1.3
9-16 yrs M & F	below 0.6	0.6 - 1.0	above 1.0
17+ yrs M & F	below 0.5	0.5 - 0.7	above 0.7
Pregnant Women[d,e]	+ 4	+ 4 - 6	+ 6
IRON[13,14,15,16] (mg/day)			
0-8 yrs M & F	below 6	6 - 8	above 8
9-16 yrs M & F	below 10	10 - 15	above 15
17+ yrs M	below 6	6 - 10	above 10
17-54 yrs F	below 10	10 - 15	above 15
55+ yrs F	below 6	6 - 10	above 10
Pregnant Women[d,f]	+ 2	+ 2 - 3	+ 3
CALCIUM[14] (mg/day)			
0-11 mos M & F	below 400	400 - 500	above 500
1-5 yrs M & F	below 500	500 - 700	above 700
6-8 yrs M & F	below 500	500 - 1000	above 1000
9-16 yrs M & F	below 700	700 - 1200	above 1200
17-21 yrs M & F	below 600	600 - 900	above 900
22+ yrs M & F	below 300	300 - 500	above 500
Pregnant Women[d,f]	+ 500	+ 500 - 700	+ 700
VITAMIN D[14] (I.U./day)			
0-18 yrs M & F and Pregnant Women[d]	below 150	150 - 400	above 400

[d]Second and third trimesters of pregnancy.

[e]This allowance should be added after calculation for age and non-pregnant weight.

[f]This allowance is added to the standard set for age.

B. NUTRIENT INTAKES	CLASSIFICATION OF INTAKES		
	INADEQUATE	MARGINAL	ADEQUATE
VITAMIN A[17] (μg retinol equivalents /kg body wt/day)[g]			
0-5 mos M & F	below 40	40 - 60	above 60
6-11 mos M & F	below 25	25 - 35	above 35
1-3 yrs M & F	below 15	15 - 25	above 25
4-12 yrs M & F	below 12	12 - 20	above 20
(retinol equivalents/day)			
13+ yrs M & F	below 500	500 - 750	above 750
VITAMIN C[14,15] (mg/day)			
0-5 yrs M & F	below 10	10 - 20	above 20
6+ yrs M & F	below 10	10 - 30	above 30
Pregnant Women[h,i]	+ 8	+ 8 - 10	+ 10
THIAMIN[17]			
(mg/day)			
0-11 mos M & F	below 0.25	0.25 - 0.4	above 0.4
(mg/1000 Cal)			
1-12 yrs M & F	below 0.25	0.25 - 0.4	above 0.4
(mg/day)			
13+ yrs M & F	below 0.5	0.5 - 0.8	above 0.8
or, if caloric intake is above 2000 (mg/1000 Cal)	below 0.25	0.25 - 0.4	above 0.4

[g]Retinol equivalent is the biological equivalent of 1 μg retinol, calculated as:

$$\frac{\text{Preformed Vitamin A(I.U.)}}{3.33} + \frac{\beta\text{-Carotene(I.U.)}}{10}$$

[h]Second and third trimesters of pregnancy.

[i]This allowance should be added to non-pregnant standard.

B. NUTRIENT INTAKES	CLASSIFICATION OF INTAKES		
	INADEQUATE	MARGINAL	ADEQUATE
RIBOFLAVIN[17]			
(mg/day)			
0-11 mos M & F	below 0.30	0.30 - 0.55	above 0.55
(mg/1000 Cal)			
1-12 yrs M & F	below 0.30	0.30 - 0.55	above 0.55
(mg/day)			
13+ yrs M & F	below 0.60	0.60 - 1.10	above 1.10
or, if caloric intake is above 2000 (mg/1000 Cal)	below 0.30	0.30 - 0.55	above 0.55
NIACIN[17] (Niacin equivalent)[j]			
(equiv./day)			
0-11 mos M & F	below 4.4	4.4 - 6.6	above 6.6
(equiv./1000 Cal)			
1-12 yrs M & F	below 4.4	4.4 - 6.6	above 6.6
(equiv./day)			
13+ yrs M & F	below 8.8	8.8 - 13.2	above 13.2
or, if caloric intake is above 2000 (equiv./1000 Cal)	below 4.4	4.4 - 6.6	above 6.6

C. ANTHROPOMETRIC MEASUREMENTS	RISK CATEGORIES		
	HIGH	MODERATE	LOW
PONDERAL INDEX[k,18]			
20+ yrs (except pregnant women)	below 11.6	11.6 - 12.5	12.5 and above

[j]Niacin equivalent is the biological equivalent of 1 mg niacin, calculated as:

$$\frac{\text{tryptophan (mg)}}{60} + \text{niacin (mg)}$$

[k]Ponderal Index = $\frac{\text{Height (in)}}{\text{cubic root weight(lb)}}$

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CHAPTER 5 – ENERGY BALANCE AND BLOOD LIPIDS

5.1 INTRODUCTION

Energy

Foods must provide sufficient energy (Calories) to meet the demands of basal metabolism, growth and activity. Foods vary in caloric density: fat is the most concentrated source of energy supplying 9 Cal/g, whereas protein and carbohydrate supply 4 Cal/g. The major sources of energy in the Canadian diet are cereal-based products, sugars and syrups, fats and oils, dairy products and meat (1). Alcoholic beverages may also provide significant amounts of energy.

Standards for assessing caloric requirements are usually based on age, body weight and physical activity. In this report, caloric intakes are given as Cal/kg body weight and as total Cal/day. A standard for caloric intake is not used because of the difficulty in obtaining information from each participant about physical activity at work and leisure.

Inadequate caloric intakes cause a wasting of body tissue which can lead to marasmus, a condition which is common in parts of the world where the total food supply is restricted. This form of malnutrition is most serious during infancy and childhood when the nutrient requirements for tissue growth and development are high. In contrast, the consumption of energy in excess of the requirements for prolonged periods leads to obesity.

Although the terms overweight and obesity are often used synonymously, obesity, an excessive accumulation of body fat, is the more extreme condition. Unfortunately, universally accepted criteria by which obesity may be distinguished from overweight have not been established (2).

Obesity is often the commonest nutritional disease in affluent societies in which sedentary life styles predominate, but exact figures for the prevalence of the disorder have not been determined. A survey in the United States has shown that about 15% of men and 20% of women of the population were overweight to an extent associated with increased mortality (3) and a nationwide study in Canada in 1957 found 13% of males and 23% of females to be obese on the basis of excessive skin-fold thicknesses and body weight (4). A study in Quebec in 1972 found 23% of women and 14% of men with weights 25% above a theoretical ideal weight (5).

The most accurate methods for assessing total body fat are based on measurements of body density, body water or body potassium, but these tests can be performed only in a laboratory. Screening for overweight in a

population survey is usually confined to anthropometric measurements (height, weight and skin-fold thicknesses) which are compared with standards. The Ponderal Index, which is the height divided by the cubic root of the weight, was used in the Nutrition Canada survey as an indicator of overweight. Insurance statistics for males show a relationship between increasing mortality and decreasing Ponderal Index (increasing overweight), with an upward shift in mortality at a Ponderal Index of 12.5 and a very sharp increase at 11.6 (6). Values below 11.6 are associated with frank obesity. The insured, however, are a special group and may not represent the general population (7,8), and the application of the Index to women, Indians and Eskimos has not been thoroughly examined.

Excessive body fat has been related to abnormalities in glucose metabolism. For example, more insulin is required to metabolize ingested carbohydrate in obese persons (9). Evidence suggests that enlargement of fat cells is responsible for this insulin insensitivity (10) and that obesity is a factor in the development of diabetes. Diabetes is common in obese persons and diabetics are especially prone to develop coronary heart disease and other forms of atherosclerosis (11). Also, obesity tends to aggravate hypertension (high blood pressure) (12,13) and certain forms of heart disease (14). Collectively, these disorders are the leading causes of death in Canada (15).

Long-term success in the treatment of obesity has proved difficult to achieve (16). Research has therefore focussed on the identification of etiological factors with the hope that such knowledge would lead to improved methods of obesity control. Although birth weight and subsequent obesity do not appear to be related (17), excessive weight gain in infancy has been associated with later childhood obesity (18) and there is abundant evidence that childhood obesity persists into adulthood (19). This trend may have a physiological basis since the number of fat cells is often high in obesity, and evidence from animal and human studies (20,21) strongly suggests that the number of fat cells is determined very early in life.

Obesity in adults may be caused not only by overeating but also by lack of exercise, a problem of increasing importance in prosperous industrial societies where the physical activity associated with daily living is continually decreasing. Psychological, cultural and social factors are likely to be involved and there is evidence that genetic background is also important (22).

Blood Lipids

Many investigations into the causes of coronary heart disease (CHD) and other forms of atherosclerosis have been concerned with the relationship between circulating blood lipids (particularly cholesterol and

triglycerides) and the development of CHD. The results of epidemiological studies have demonstrated that persons with higher than normal serum cholesterol values develop CHD with a greater frequency and that the risk of cardiovascular disease is proportional to the degree of elevation of blood cholesterol (23). Other studies have shown that a high serum triglyceride level in fasting individuals is also an important risk factor (24,25).

Both dietary triglycerides and cholesterol can influence serum cholesterol levels, yet their relative importance is disputed (26,27). Studies in men have supported the hypothesis that polyunsaturated fatty acids, such as linoleic acid, have a hypocholesterolemic effect and reduce the risk of CHD (28), and that increasing the relative proportion of linoleic acid in the diet is the most effective means of reducing blood cholesterol levels (29). Physical fitness can also favourably affect blood lipid levels, and low blood cholesterol levels can be maintained even in the presence of high fat and high caloric intakes (30). This illustrates the importance of balancing energy intake and expenditure. Because of the inadequacies of current knowledge, it is not yet possible to state categorically the specific relationship between the dietary content of fatty acids and cholesterol and the development and progression of atherosclerosis.

Associations between body fatness and the level of blood lipids (triglycerides and cholesterol) have been reported (31,32). Although correlations are not always found (33), rapid weight gain or loss is accompanied by an elevation or depression, respectively, of serum cholesterol levels (34,35). The importance of body weight in control of blood lipid levels has been underlined by the results of a study of a small group of individuals whose blood lipid levels were monitored over a 30-year period. In the absence of weight gain there was little or no increase in serum lipid levels with ageing in men (36). Also, some metabolic and genetic disorders have been shown to be characterized by elevated serum lipid levels and higher incidences of atherosclerosis (37,38).

In the Nutrition Canada survey, serum cholesterol values were classified according to standards evolved from the Framingham Study. Standards should be viewed with caution since there is no clear division between normal and abnormal, and a "normal" level for a western industrialized society may not necessarily be a "safe" level. There is insufficient research to establish a standard for individuals up to 20 years of age, and for pregnant women who normally have elevated cholesterol levels; samples from these groups were therefore not classified. Although triglyceride determinations were restricted to samples from persons who did not have a meal in the preceding four hours, this period of time was not sufficient to enable risk criteria to be applied. Also dietary cholesterol and saturated and polyunsaturated fat intakes could not be computed from the 24-hour recalls because of incomplete food composition

tables. However, total fat intakes will be reported at a later date in the Nutrition Canada food consumption pattern report.

5.2 *NATIONAL RESULTS*

Caloric Intake

The distribution of caloric intakes is given in Cal/kg body weight in Table 5.1 and in Cal/day in Table 5.3 and Figure 5-1. The median caloric intakes (Cal/kg body weight) at different ages are shown in more detail in Figure 5-4.

Although no standards for caloric intake were set, some comparison of intakes with generally accepted recommendations can be given. In the first year of life, energy requirements range from 120 Cal/kg in the first 3 months to approximately 105 Cal/kg at 11 months, with an average during the first year of 112 Cal/kg (39). It is apparent that the median intake of infants under 1 year of age was close to this figure (Table 16.1). Standards for children up to 10 years of age have been based on the food intake of children in good health. However, in this survey the median intakes were higher than the average requirements, as recommended by WHO, for normal healthy children (39). This trend was particularly noticeable in boys and it continued up to the age of 8 years. Boys between 8 and 18 years had median intakes very close to the intakes recommended by WHO. In contrast, the median intakes of teenage girls were below WHO requirements, especially in 18 year olds.

When the intakes were expressed in Cal/kg body weight, the highest intakes occurred in the 0-4 year-old group. There was a drop in intake with age in both sexes thereafter, with males of all ages having greater intakes than females. Some of the elderly women had intakes below 20 Cal/kg.

When expressed in total Cal/day, the highest median intakes were observed in teenage (2,952 Cal) and young adult males (3,188 Cal). Among males, the intakes were lowest in the elderly and the median of 1,902 Cal was below the WHO allowance of 2,100 to 2,400 Cal.

In non-pregnant females, the highest median intake (2,127 Cal) was found in the 10-19 year-old group, and the lowest in elderly women (1,479 Cal). The latter figure is slightly below the average requirement for elderly women. The median intake in pregnancy was increased by about 11% above that of the 20-39 year-old non-pregnant women. However, this increase was only 217 Cal, which is below the recommended increase of 350 Cal (39). Furthermore, the median intake of 20-39 year-old women was 1,933 Cal, a value below the average requirement of moderately active women.

Ponderal Index

There was a gradual fall in the median Ponderal Index in men between 20 and 64 years (Table 5.11). In women there was a more marked decrease in the median Index with age. A considerable number of men and women over 19 years of age was classified at high risk (P.I. < 11.6) (Table 5.13 and Figure 5-3) on the basis of the Ponderal Index. In men 40-64 years, 7% were at high risk. The mean age of this group was 51 years, and the median height was 68 inches (5 ′ 8 ″). An individual of this height who was classified at high risk would have a body weight in excess of 200 lbs, whereas an individual classified at low risk would weigh less than 161 lbs. Of the male groups, men over 64 years of age had the highest proportion at high risk (8.2%).

Considerably more women than men were classified at high risk and, although a definite relationship with mortality has not been established for women, it is evident that women with a P.I. of less than 11.6 are obese. For example, in a woman of height 5 ′ 1″ , a Ponderal Index of 11.6 corresponds with 145 lbs, whereas a Ponderal Index of 12.5 corresponds with a weight of 116 lbs.

The data for moderate risk followed the same pattern as for high risk: the elderly men and women falling into this range more frequently than the younger adult groups. The prevalence of moderate risk was very high, reaching between 40 and 60% in the elderly.

Serum Cholesterol

Middle-aged and elderly men and women had higher median values than the young adult groups (Table 5.5). Women over 64 years of age had the highest median value. Furthermore, the median levels in elderly women were 25 mg higher than those of men in the same age group. Except in these groups, there was very little difference in serum cholesterol levels between the sexes. The median value of pregnant women was characteristically higher than those observed in the other physiological groups.

Approximately 10 to 13% of adult men were classified at high risk, but larger percentages of middle-aged women (33.4%) and elderly women (29.2%) were in this category (Table 5-7 and Figure 5-2). In accordance with previous studies, the standard of risk was set lower for women than for men. This accounts, in part, for the greater prevalence of risk values in females. It is possible, however, that the high risk values are related to the overweight observed in middle-aged and elderly women.

There were no major differences in serum cholesterol values visible in seasonal and population density breakdowns.

Serum Triglycerides

Serum triglyceride levels are markedly affected by the ingestion of food. Although the triglyceride determinations were restricted to samples from persons fasted for at least four hours, this period was not considered to be long enough to enable risk criteria to be applied to the values. Moreover, only a relatively small number of samples was suitable for analysis (Table 5.9).

The lowest median values were found in children and adolescents. The highest value in adult men was observed in the 20-39 year-old group and the lowest value was observed in the elderly. The median level was lower in women than men but elderly women had a higher value than younger women. As in the serum cholesterol findings, pregnant women had the highest value of any group.

5.3 INDIAN RESULTS

Caloric intakes in Indians were slightly below the national figures for most physiological groups but otherwise the findings were similar (Tables 5.2 and 5.4 and Figure 5-1).

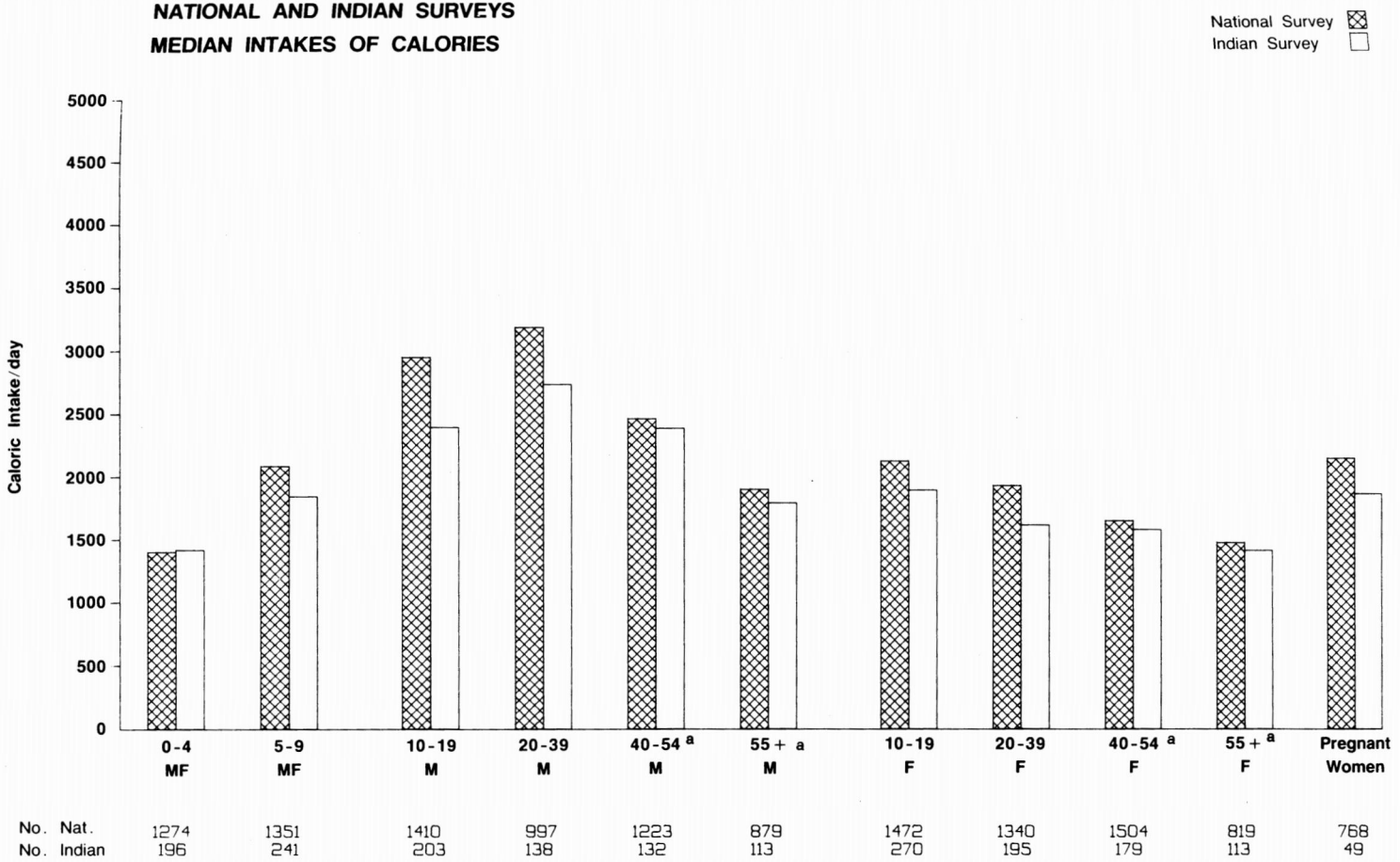
The distribution (Table 5.12) and risk classification (Table 5.14) of Ponderal Index values followed a similar pattern to the national figures. The percentage of Indians at risk was generally higher than that found in the national survey, particularly in women.

The distribution and risk classification of serum cholesterol values are presented in Tables 5.6 and 5.8. There were fewer adult Indians classified at risk than in the national survey (Figure 5-2) except in the elderly men.

Figure 5-1

NATIONAL AND INDIAN SURVEYS

MEDIAN INTAKES OF CALORIES



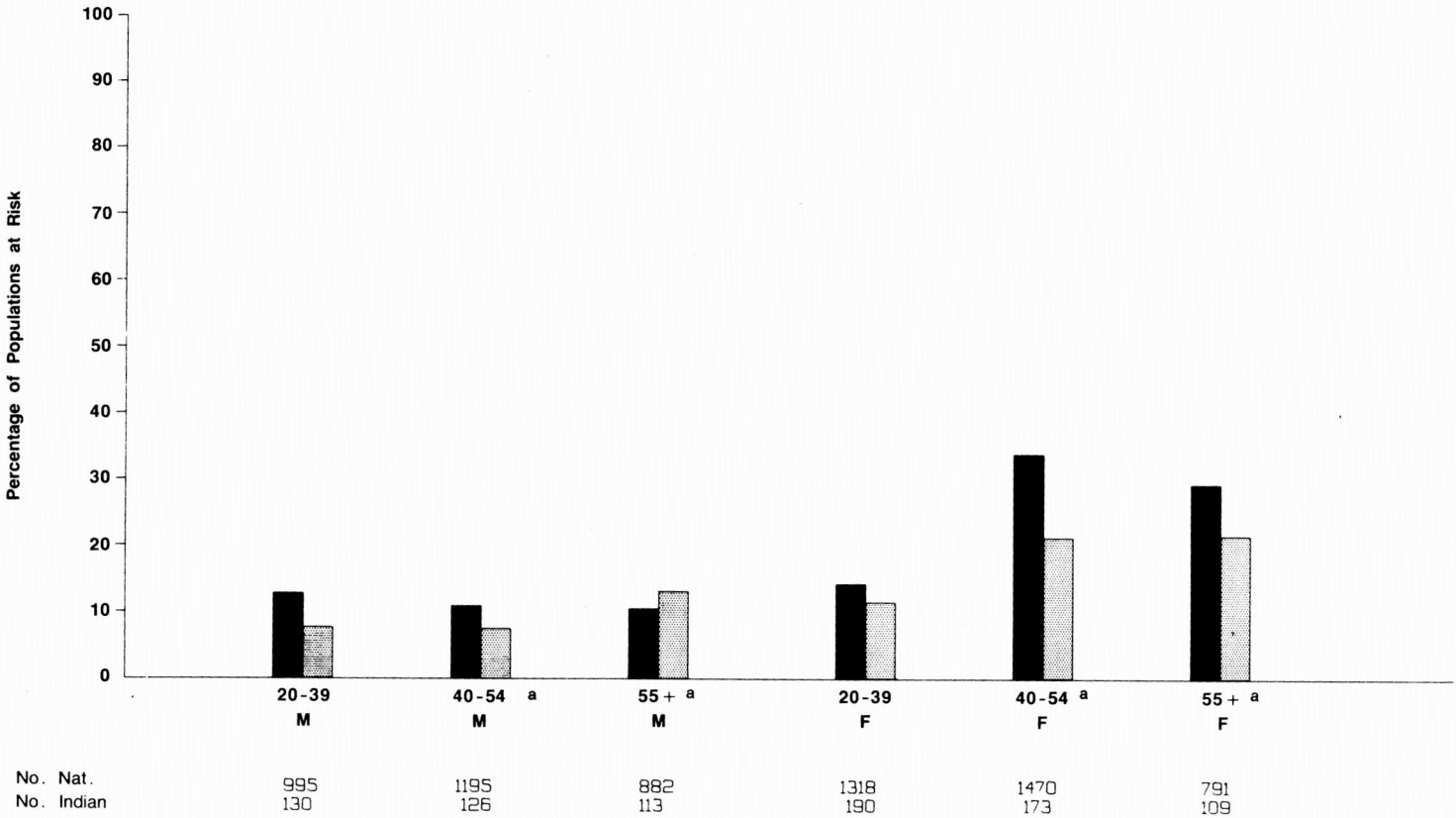
	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [a] M	55 + [a] M	10-19 F	20-39 F	40-54 [a] F	55 + [a] F	Pregnant Women
No. Nat.	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
No. Indian	196	241	203	138	132	113	270	195	179	113	49

[a]Population nationale (40-64 M&F, 65 + M&F).

Figure 5-2

NATIONAL AND INDIAN SURVEYS

CLASSIFICATION OF SERUM CHOLESTEROL VALUES



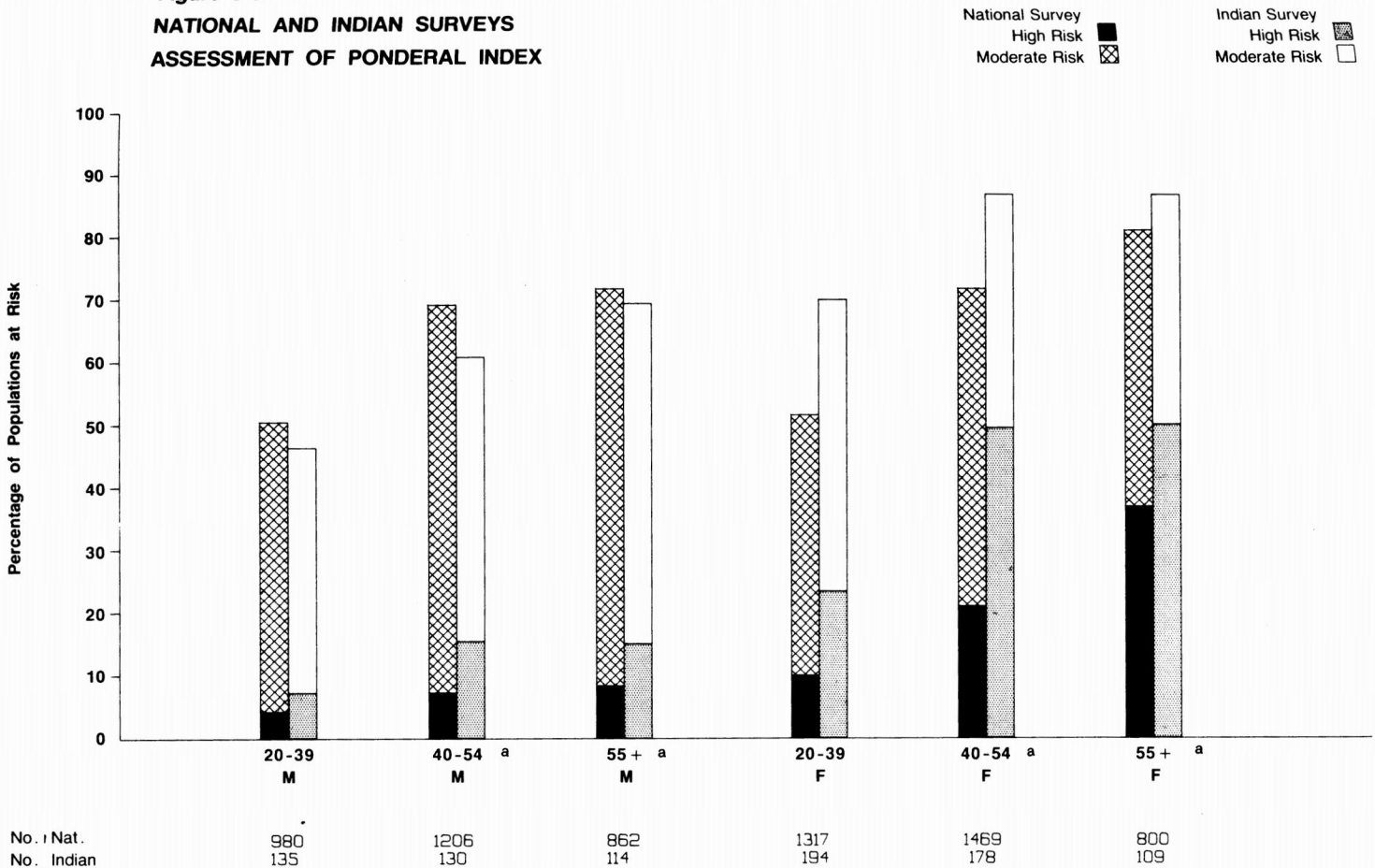
	20-39 M	40-54 a M	55 + a M	20-39 F	40-54 a F	55 + a F
No. Nat.	995	1195	882	1318	1470	791
No. Indian	130	126	113	190	173	109

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 5-3

NATIONAL AND INDIAN SURVEYS

ASSESSMENT OF PONDERAL INDEX

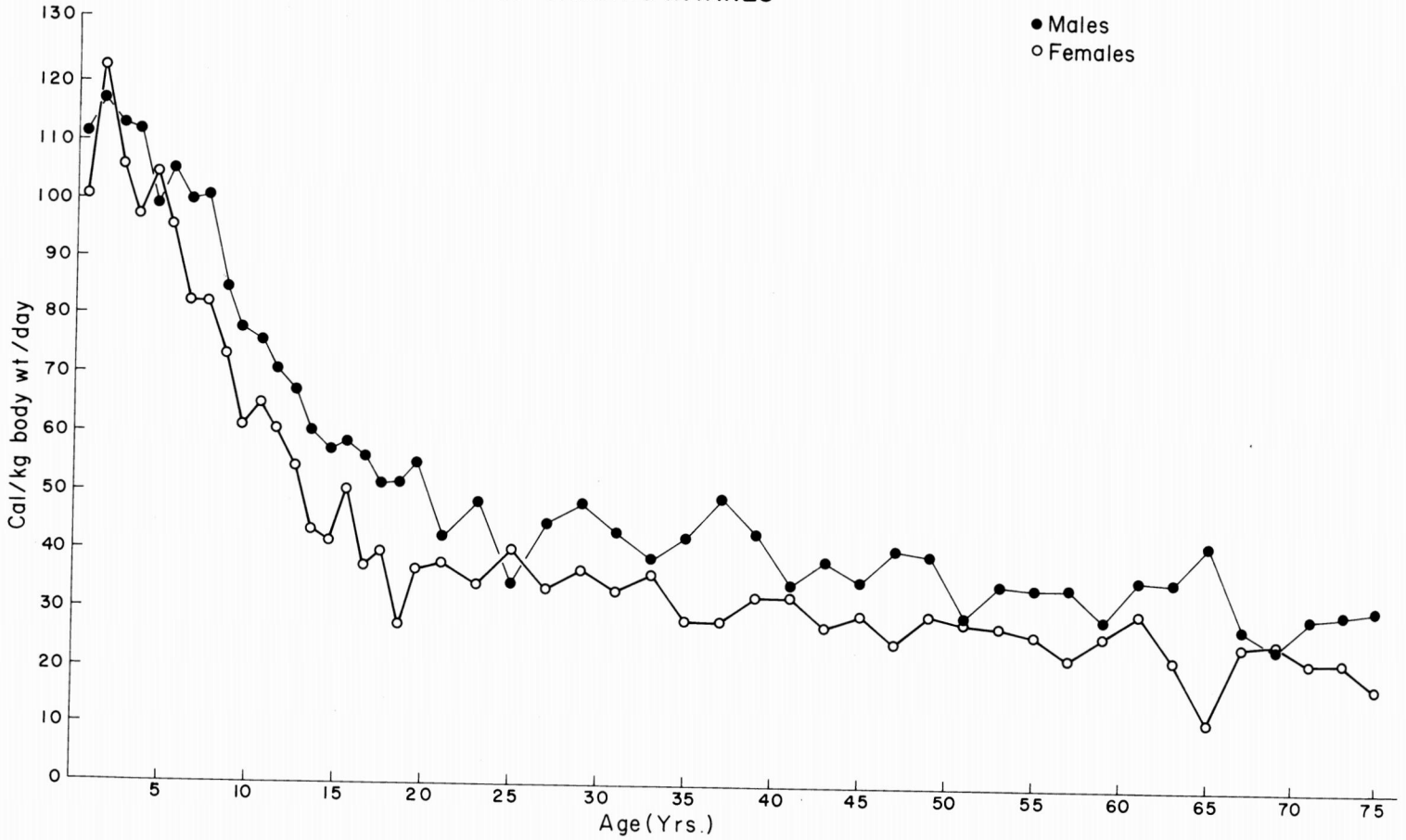


	20-39 M	40-54 a M	55+ a M	20-39 F	40-54 a F	55+ a F
No. Nat.	980	1206	862	1317	1469	800
No. Indian	135	130	114	194	178	109

[a]Population nationale (40-64 M&F, 65 + M&F).

FIGURE 5-4

NATIONAL SURVEY
MEDIAN VALUES OF CALORIC INTAKES



5.4 SUMMARY

The caloric intakes were characterized by a wide range of values. This finding to some extent reflected individual differences in caloric requirement but it was also a consequence of the variability of intakes recorded in the 24-hour recalls.

In general there were few interprovincial differences in caloric intake but the median intakes of Indians were lower than the corresponding national figures and the lowest intakes were recorded among Eskimos. The recorded intakes in some groups, particularly the elderly and Eskimo women, would be unlikely to supply adequate amounts of micronutrients. Furthermore, the very low caloric intake of pregnant Eskimo women is cause for concern; studies should be initiated to ascertain whether inadequate weight gain, with its potentially deleterious effects on fetal development, is occurring during pregnancy.

The median caloric intakes of children below 10 years of age appeared to be in excess of generally accepted requirements. Whether this finding was related to the number of overweight children must await further analysis of the anthropometric data. The median caloric intakes of teenage girls were below requirements, especially in 18 year olds. The caloric intakes of adults did not appear to be excessive although the problem of overweight, as assessed by the Ponderal Index, existed throughout Canada with few interprovincial or ethnic differences. Furthermore, in a significant number of adults, the degree of overweight reached the extreme of obesity.

The very high prevalence of overweight, in the presence of caloric intakes not excessive in relation to requirements, was a finding which merits further attention. Overweight in adults may be a result of past nutritional history and longitudinal studies would aid in the interpretation of this problem. Underestimations and omissions in the dietary recall and sedentary life style should also be considered as relevant factors.

High levels of serum cholesterol were found in adults throughout the provinces whereas a lower prevalence was seen among Indians and Eskimos, particularly male Eskimos. This finding may be related to cultural differences such as dietary patterns, physical activity and degree of stress.

Over-all, the results indicated that overweight, obesity and elevated cholesterol levels are health hazards of major proportions which warrant emphasis in preventative programs.

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CHAPTER 6 – PROTEIN

6.1 INTRODUCTION

Protein is an essential constituent of every living cell and next to water is the major component of the body tissue. It is required for the growth of new tissue, for tissue repair and for the replacement of maintenance losses. Demand for protein is particularly high during periods of rapid tissue growth such as infancy, childhood, adolescence and pregnancy. Protein also has important regulatory functions such as the control of osmotic pressure, water balance and acid-base balance of body fluids.

All forms of protein are composed of amino acids. Of the 22 amino acids known to be physiologically important, 8 are termed essential for the human. The essential amino acids must be supplied in the diet whereas non-essential amino acids, also important for maintenance and growth, may be formed within the body.

An adequate protein intake is one which supplies all the essential amino acids in sufficient amounts to satisfy maintenance needs and the additional demands of normal growth. Animal protein sources generally supply a good balance of the essential amino acids; foods of plant origin are also sources of protein but may be limiting in one or more of the essential amino acids. Appropriate combinations of plant proteins, however, can provide a balanced protein intake through mutual supplementation of amino acids.

A diet severely deficient in protein results in poor growth, decreased resistance to infection, edema, liver dysfunction and ultimately death. Irreparable brain damage is also suspected to occur in infancy. Protein deficiency in man rarely occurs in a simple form: diets deficient in protein are usually deficient in other nutrients and most frequently in energy. The resultant syndrome is termed protein–calorie malnutrition (PCM).

PCM is the commonest nutritional disorder of early childhood in developing countries (1). It can occur at any age but the highest incidence has been shown to occur in the second year of life (2). The clinical manifestations of the syndrome are well documented (3). The most consistent indicators of PCM in children under 6 years of age (bilateral pretibial pitting edema, major and minor weight deficit, and painless pluckability of hair), were selected as clinical signs for use in the Nutrition Canada survey. The first sign of PCM in early childhood is growth failure and the commonest method of screening for mild-to-moderate PCM is based on body weight. Serial weighings are preferable so that growth can be monitored. However, in the Nutrition Canada survey only a single weighing was feasible and the weights obtained were compared with standards for normal, healthy children of the same age (4). A weight deficit

may result from different factors and does not differentiate between the "wasted" (low weight for height) and the "stunted" (low weight and height) child (5). Further anthropometric measurements are necessary to diagnose PCM and to characterize its type, extent and duration (6).

There are a number of biochemical tests for protein status but only two, total serum protein and serum albumin, are practicable in a large survey. Serum levels of these parameters are below the normal range when clinical signs of protein malnutrition first appear (7,8,9,10,11). However, in detecting mild-to-moderate PCM, there is not universal agreement as to the significance of changes in serum levels (12).

The interpretation of changes in serum protein levels during pregnancy is ambiguous due to the difficulty in distinguishing between pathological and normal physiological events. Biochemical and clinical standards evolved for non-pregnant women cannot be used for the assessment of nutritional status during pregnancy because of the extensive adaptive changes (13,14). For example, the blood volume increases substantially during the first trimester and it remains increased during the second and third. There is also doubt whether some current standards established for pregnant women (15) are sufficiently liberal to account for these normal changes. A recently completed survey in the United States (16) found that a very high percentage of pregnant and lactating women had low serum albumin values even though their mean protein intakes were above the standard. In the Nutrition Canada survey a special standard has been applied to women in the second and third trimesters of pregnancy. In view of the uncertainty surrounding a standard for women in the first trimester, data from these women were not included in the results.

Previous surveys of protein nutrition in Canada have placed emphasis on studies of dietary intake. A few included clinical and biochemical evaluations. In a study of Metis children between the ages of 2 months and 5 years, no evidence of edema was found but a small percentage of pre-school girls had low total serum protein levels (17,18). A survey of school children in British Columbia and Saskatchewan showed that a high percentage of children were "thin" and consumption of dairy products was poor. Although there was no evidence of edema, 18% had total serum protein values below 6 g/100 ml (19). Other surveys in Quebec (20), Manitoba (21) and East York Township (22) indicated protein intakes were adequate.

6.2 NATIONAL RESULTS

Children under 5 years of age had the highest median intakes when expressed in g/kg body weight (4.06 g/kg in children 0-4 years old) and women over 64 years had the lowest (0.78 g/kg) (Table 6.1). The intakes of

infants under 1 year of age were found to be highest, with the majority of values well in excess of the interpretive standards (Table 16.2). The standard of adequacy, indicated by an arrow, is not shown in Figure 6-1 for children below 5 years of age because of the multiple standards for this group.

The median intakes of children, young and middle-aged males and non-pregnant females were well above the standards. Within each age group, men had higher median intakes in relation to body weight than women. The median intake (0.78 g/kg) of women over 64 years of age, however, was only slightly above the standard which suggests that a proportion of this age group may consume less than adequate amounts of protein.

The intakes in g/day increased up to 40 years of age in males and then decreased (Table 6.3). The pregnant women had higher (79 g/day) median intakes than non-pregnant women (66.6 g/day). The standard for pregnant women was based on body weight before pregnancy plus a fixed pregnancy allowance. In the percentage distributions, the actual pregnant weight has been used, so use of the standard is not directly applicable. However, assuming weight before pregnancy is approximately 56 kg, an adequate intake would be 56 times 0.7 g/kg body weight (the interpretive standard of adequacy for adults) plus an additional allowance of 6 g for pregnancy. The median intake of 79 g (Table 6.3) was therefore well above the calculated intake of 45 g.

The percentage contribution of protein to the total caloric intake was fairly constant, falling within the range of 13 to 15%.

Few individuals of any age were classified at high risk on the basis of their serum protein values (Table 6.7 and Figure 6-2). The distributions showed that the serum protein values increased gradually in the first three age groups (Table 6.5). Serum levels were maintained between 7 to 7.22 g/100 ml thereafter with adult women having lower values than men. The change in standard for serum protein values at 6 years of age did not coincide with the gradual change in median values and may account for the relatively high prevalence (5.7%) of children 5 through 9 years old classified at moderate risk. Few individuals between the ages of 10 through 64 had values classified at moderate risk but there was higher prevalence of moderate risk values among men and women over 64 years of age.

The characteristic drop in the serum protein values during pregnancy was apparent: the median value for pregnant women was 6.39 g/100 ml whereas that for non-pregnant women (20-39 years) was 7.15 g/100 ml. The decrease during pregnancy was greater than the difference between the standards and this discrepancy may account for the greater incidence of moderate risk values in the pregnant group. Few values (0.3%) for pregnant women were classified at high risk.

Distributions of serum albumin values are given in Table 6.9. The values increased up to the age of 20 years in males with a marked fall in men over 39 years of age. In girls (10-19 years) the serum levels were not different from those of children (5-9 years). The levels for women decreased in those over 19 years of age with the values for middle-aged and older women being similar to those of males. People over 64 years of age had appreciably lower serum albumin values than any other group, except pregnant women in whom lower values were expected.

The serum albumin values were not used to classify individuals into risk groups because a suitable standard has not been established for the method employed in this survey.

The relative constancy of the total serum protein values in adults compared with the fall in serum albumin values which occurs with increasing age may be due to higher gamma globulin levels.

The clinical tests for protein deficiency were applied only to children under 6 years of age (see Chapter 15 for details of clinical findings).

6.3 INDIAN RESULTS

In men and women the median protein intakes were above the standard of adequacy and were similar to those presented for the national sample. Median intakes were lowest and nearest the standard in those over 54 years of age (Figure 6-1).

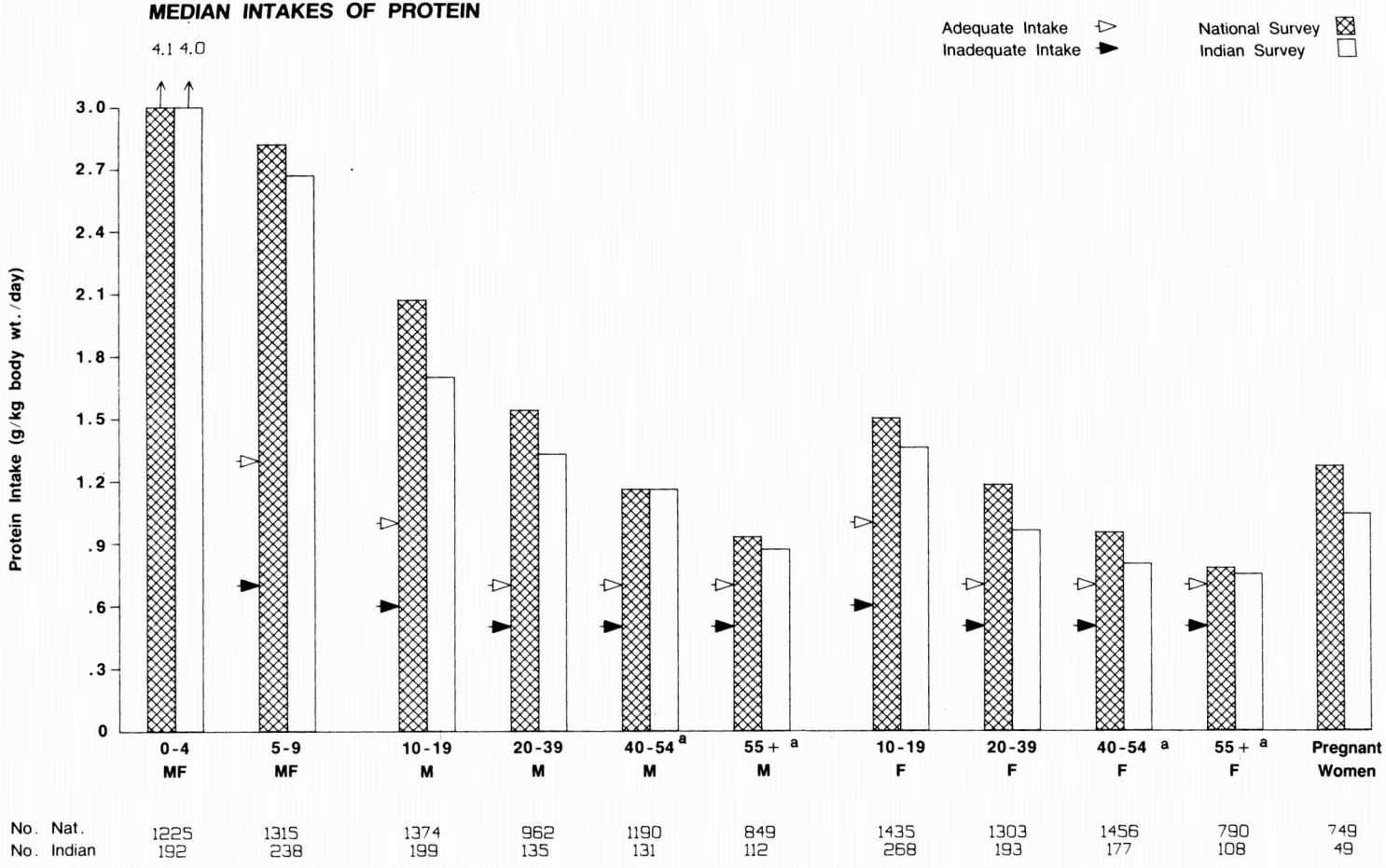
Very few persons were classified at risk on the basis of total serum protein values (Table 6.8). However, some very low serum albumin values were observed in pregnant women and women over 54 years of age (Table 6.10). This suggested that inadequate protein intake may be a problem for some individuals in these groups.

Median values of total serum protein (Table 6.6) were generally higher and serum albumin values were lower than those observed in the national survey indicating that there may be ethnic differences in serum globulin levels which result in high total serum protein levels.

Figure 6-1

NATIONAL AND INDIAN SURVEYS

MEDIAN INTAKES OF PROTEIN



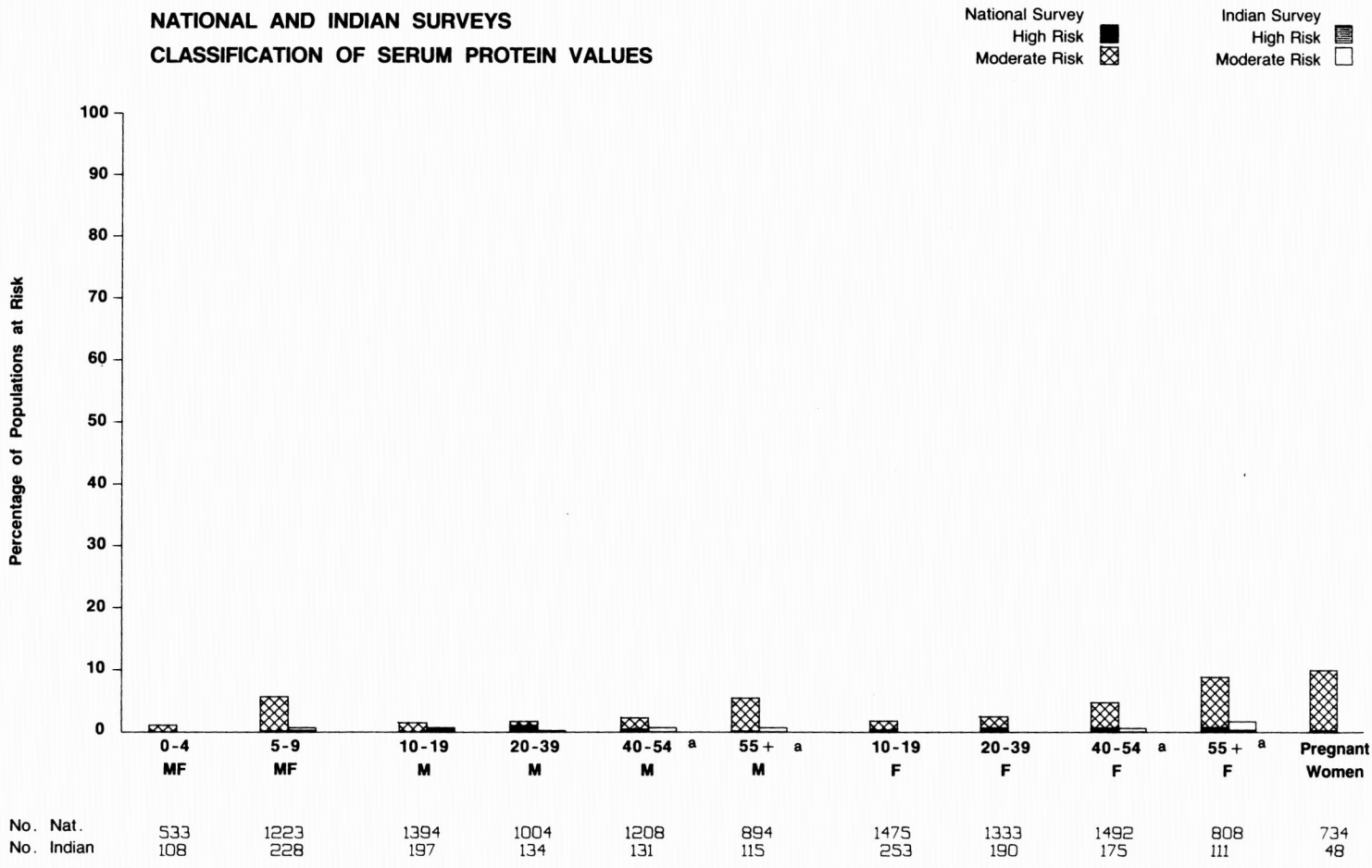
	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 a M	55 + a M	10-19 F	20-39 F	40-54 a F	55 + a F	Pregnant Women
No. Nat.	1225	1315	1374	962	1190	849	1435	1303	1456	790	749
No. Indian	192	238	199	135	131	112	268	193	177	108	49

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 6-2

NATIONAL AND INDIAN SURVEYS

CLASSIFICATION OF SERUM PROTEIN VALUES



[a]In National Survey (40-64 M&F, 65 + M&F).

6.4 SUMMARY

The dietary findings showed that the median intakes of protein for all the physiological groups were above the interpretive standard of adequacy.

A small percentage of children under 5 years of age had a moderate weight deficit but in view of the biochemical and dietary evidence it seems unlikely that this weight deficit was due to nutritional factors. Furthermore, the median intakes in infants under 1 year of age (expressed in g/kg) were higher than in the other physiological groups and were almost three times greater than the standard. Habitual consumption of such high protein intakes may not be desirable for very young infants when the ability of the immature kidney to cope with high solute loads may be limited.

The dietary protein intakes in adults appeared adequate although the elderly had lower intakes than any other group. In some provinces, intakes in the elderly fell in the marginal range and this was often more evident in women than in men. Biochemical evidence supported the dietary findings with moderate risk serum protein values being commonest in the elderly. Serum albumin levels were also lower in the elderly than in other groups.

Median protein intakes of pregnant women were considered adequate. There were some moderate risk values in spite of the fact that the interpretive standards allowed for an expected fall in levels during pregnancy. Serum protein changes in pregnancy were difficult to interpret because it is difficult to establish normal values for this group. The significance of low serum protein levels in pregnancy merits further study.

Both Indians and Eskimos were characterized by higher total serum protein values and lower serum albumin values than were observed in the national sample. Further research is needed to determine whether this was a true ethnic difference or whether it was due to nutritional or other factors. The findings in Indians were much the same as in the national sample but serum albumin values during pregnancy were generally lower than those of pregnant women in the national sample. This finding may indicate an inadequate protein status. In Eskimos there was no evidence of unsatisfactory protein status.

Over-all, the results indicated that the protein status of the majority of children, adolescents and adults was satisfactory. However, both dietary and biochemical evidence suggested that the protein status of the elderly was only marginally adequate.

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CHAPTER 7 – THIAMIN, RIBOFLAVIN AND NIACIN

7.1 INTRODUCTION

Thiamin

Thiamin (vitamin B_1), in the form of the coenzyme, thiamin pyrophosphate, has a major role in carbohydrate metabolism. When the diet is deficient in the vitamin, pyruvic acid and other carbohydrate metabolites accumulate in the tissues. Abnormally high levels of these substances are thought to be responsible for many of the characteristic symptoms of the thiamin deficiency disease, beriberi.

Modest amounts of thiamin occur in common foods such as egg yolks, peanut butter, vegetables, dried fruits, some fish and some meat. Dried legumes, pork, organ meats and nuts are better sources and brewers yeast and wheat germ are exceptionally rich in the vitamin. Grains contain substantial amounts of thiamin before processing but a large proportion of the vitamin can be lost during milling and refining. Thiamin is frequently added, therefore, to products such as flour, infant cereals and breakfast cereals (1,2).

Thiamin is readily destroyed by heat and the thiamin content of foods can be seriously reduced by an inappropriate method of cooking and processing (3).

There is a relationship between thiamin requirements and energy expenditure and recommended intakes are usually expressed relative to the caloric content of the diet (4).

The thiamin in blood, which is concentrated in the red cells, is not consistently depressed even after dietary thiamin restriction. The level is therefore a poor index of nutritional status. Tests of the activity of the enzyme transketolase in red cells, however, can be used to detect early thiamin deficiency (5). The urinary excretion of thiamin, which was measured in this survey, may be used to assess the thiamin status of a group; it is less useful in the identification of an individual with a clinical deficiency. Tentative standards have been published for the interpretation of urinary levels in surveys but, as originally formulated, they applied only to young men. A series of values has been calculated for other age groups and for females (6); these standards have been adopted, with minor modifications, in this survey.

Beriberi is characterized by emotional disturbances, peripheral neuritis, edema and heart failure. Mild deficiency of thiamin can cause dyspepsia, constipation, listlessness and apathy. Beriberi has been reported infrequently in Canada and only isolated cases are cited in mortality statistics

and nutrition surveys (7). In Labrador and Newfoundland, the disease was relatively common at the beginning of the century among fishermen. In these instances, the diet was poor in fresh meat and vegetables and sometimes consisted of only tea and bread prepared from refined flour (8). Beriberi remained endemic among fishermen and those living on the Newfoundland coast up to the 1930's (9). There was no evidence of peripheral neuritis in a survey in Newfoundland in 1945 but vague general complaints, such as irritability, dyspepsia and lassitude, were common and suggestive of mild thiamin deficiency (10). The enrichment of refined flour with thiamin was made compulsory in Newfoundland in 1945 and, according to a medical survey of the island in 1948, the occurrence of dyspepsia and constipation was noticeably reduced (11).

Riboflavin

Riboflavin (vitamin B_2) occurs in tissues in combination with phosphoric acid and adenine. These riboflavin-containing nucleotides are coenzymes for flavoprotein enzymes, which catalyze numerous oxidation-reduction reactions involved in the metabolism of amino acids, fatty acids and carbohydrates.

Organ meats are the richest sources of riboflavin; legumes, meat, fish and dairy products also contain significant amounts. Milk is the most important source of riboflavin because of its high consumption in North America. Riboflavin is less susceptible to heat than thiamin but it is readily destroyed, especially in milk, by exposure to light (12). The riboflavin content of flour and cereals is reduced during processing and therefore these products are frequently enriched.

Riboflavin requirements have been related to growth, metabolic rate, body size, caloric intake (4,13) and protein (14). In this survey, the interpretive standard for the dietary intakes of riboflavin has been expressed relative to energy. Fixed intakes are stipulated however for those consuming less than 2,000 Cal/day.

Riboflavin and several derivatives occur in blood plasma, red cells and white cells. The content of the red cells is a sensitive indicator of riboflavin status but the other parameters are less useful in this respect (6). The daily urinary excretion of riboflavin is highly correlated with the dietary intake (15) but the rate of excretion varies during the day: it is less at night than at other periods. The excretion may also be assessed from the ratio of the riboflavin to creatinine levels in a single urine sample. Tentative guides for the interpretation of data from different physiological groups have been calculated (6) and these have been adopted, with minor modifications, in this survey.

A fatal or severe riboflavin deficiency disease in humans has not been identified. Mild deficiency symptoms have been frequently observed and they are sometimes precipitated in pregnant women because of increased requirements (16). Early effects of riboflavin deficiency include invasion of the cornea with capillaries, glossitis, lesions of the lips, fissures at the angles of the mouth and seborrheic accumulations around the nose. Behavioural effects have also been detected (17).

In previous nutrition surveys in Canada, dietary data, urinary excretions and clinical signs have indicated definite riboflavin deficiency in 3% of some age groups and a probable deficiency in up to 20% (18). A beneficial effect of the enrichment of flour was demonstrated by the results of surveys in Newfoundland (10,11).

Niacin

Niacin (nicotinic acid, nicotinamide) is a component of the coenzymes nicotinamide adenine dinucleotide (NAD or DPN) and nicotinamide adenine dinucleotide phosphate (NADP or TPN). The vitamin is utilized in many metabolic reactions involving a wide variety of substances including fats, proteins and carbohydrates.

The vitamin occurs in plants as nicotinic acid and in animal tissues as niacinamide and in these forms it is widely distributed in foods. In addition, as humans and other animals can synthesize the vitamin from the amino acid tryptophan, proteins containing this amino acid can be a significant source of niacin activity. It is customary to express dietary data in terms of niacin equivalents which include the contribution from tryptophan. The values are calculated on the basis that 60 mg of the amino acid are equivalent to 1 mg of niacin. The recommended intakes for niacin, like those for thiamin and riboflavin, are usually expressed relative to the caloric content of the diet.

Lean meat, poultry and liver are good sources of the vitamin and yeast is an excellent source. Salmon, tomatoes, and leafy green vegetables are also important sources. During milling, most of the niacin in cereals, with the major exception of rice, is removed and therefore cereal products are often enriched (1,2). Milk and eggs are poor sources of the vitamin but they are good sources of its precursor, tryptophan.

Biochemical tests for measuring niacin status, which usually involve determination of the urinary excretion of the niacin metabolite, N-methylnicotinamide, are less satisfactory than those for thiamin and riboflavin (6). A biochemical test for niacin deficiency was not included, therefore, in this survey.

The disease pellagra occurs when the diet is deficient in niacin and low in tryptophan. The characteristic signs include a bilateral dermatitis and lesions of the tongue including hypertrophy or atrophy of the papillae and multiple fissuring. The gastrointestinal tract and the central nervous system are also affected and diarrhea, dizziness and dementia are typical symptoms in severe deficiency. Often the disease is fatal.

Pellagra was endemic in the United States, especially in the south, in the early part of this century. However, the prevalence of the disease was considerably reduced in North America by 1940 (19). Cases of pellagra have been observed infrequently in Canada (18). Lesions of the tongue, suggesting mild deficiency, were recorded in a Newfoundland survey in 1944 and a decrease in the incidence was noticeable in 1948 after the introduction of enriched foods (10,11).

7.2 NATIONAL RESULTS

Standards for the dietary intakes of thiamin, riboflavin and niacin in teenagers and adults are expressed in mg/day for individuals with energy intakes consistently below 2,000 Cal, and in mg/1,000 Cal for those with energy intakes above 2,000 Cal. Therefore, in assessing the median intakes of these vitamins, standards in mg/day and mg/1,000 Cal are both used. The standard in mg/day is more appropriate for women as their median intakes were close to or below 2,000 Cal.

Thiamin

The median daily intake (1.19 mg) of infants under 1 year of age was far above the adequate standard (0.4 mg/day) and there was a wide range of individual values which extended beyond 4 mg (Table 16.3).

As shown in Figure 7-1, the median intake, expressed in mg/1,000 Cal, for children below 10 years of age was also well above the adequate standard of 0.4 mg/1,000 Cal.

The adequate standard for older children and adults with energy intakes above 2,000 Cal is 0.4 mg/1,000 Cal. The median intakes were greater than 0.4 mg/1,000 Cal in all groups (Table 7.1). Teenage girls, young adult women and pregnant women had adequate median intakes in mg/day but the median intakes in mg/day of middle-aged and elderly women were not far above the marginal level (Table 7.3).

The urinary excretion of thiamin in μg/g creatinine is given in Table 7.5 and the values have been classified according to the risk of deficiency

in Table 7.7. The percentages of the values which indicate high and moderate risk are also shown in Figure 7-2.

Less than 1% of the values from each group fell into the high risk category but larger percentages were classified at moderate risk. Adult men had the highest prevalence of moderate risk values.

Clinical signs associated with thiamin deficiency are discussed in Chapter 15.

Riboflavin

The intakes of riboflavin are given in mg/1,000 Cal in Table 7.9 and in mg/day in Table 7.11. The median values in mg/1,000 Cal are shown in Figure 7-3.

The median intake of infants under 1 year of age was four times the adequate standard and 98% of the values were in the adequate range (Table 16.4). The adequate standard for children 1-12 years of age and adults with energy intakes over 2,000 Cal was 0.55 mg/1,000 Cal; in teenagers and adults with intakes below 2,000 Cal, the diet needed to provide 1.1 mg riboflavin/day to meet the adequate standard. The median intakes of all groups were well above these levels, although those of middle-aged and elderly women in mg/day were not greatly in excess.

The urinary excretions of riboflavin in μg/g creatinine are given in Table 7.13 and the percentages in each risk category are given in Table 7.15 and shown in Figure 7-4. Few of the values were classified at high risk but between 1.4 and 8% were classified at moderate risk. Teenage girls had the highest proportion at moderate risk.

Clinical signs associated with riboflavin deficiency are discussed in Chapter 15.

Niacin

The dietary intakes of niacin are given in mg niacin equivalents/1,000 Cal in Table 7.17 and mg niacin equivalents/day in Table 7.19. The median intakes in mg niacin equivalents/1,000 Cal are shown in Figure 7-5.

The median intake of infants under 1 year of age (16.6 mg) was far above the adequate standard of 6.6 mg/day (Table 16.5). As displayed in

Figure 7-5, the median intakes of children below 10 years of age were approximately double the adequate standard (6.6 mg/1,000 Cal).

The median intakes of adults were well above the adequate standards of 6.6 mg/1,000 Cal and 13.2 mg/day.

The clinical signs associated with niacin deficiency are discussed in Chapter 15.

7.3 INDIAN RESULTS

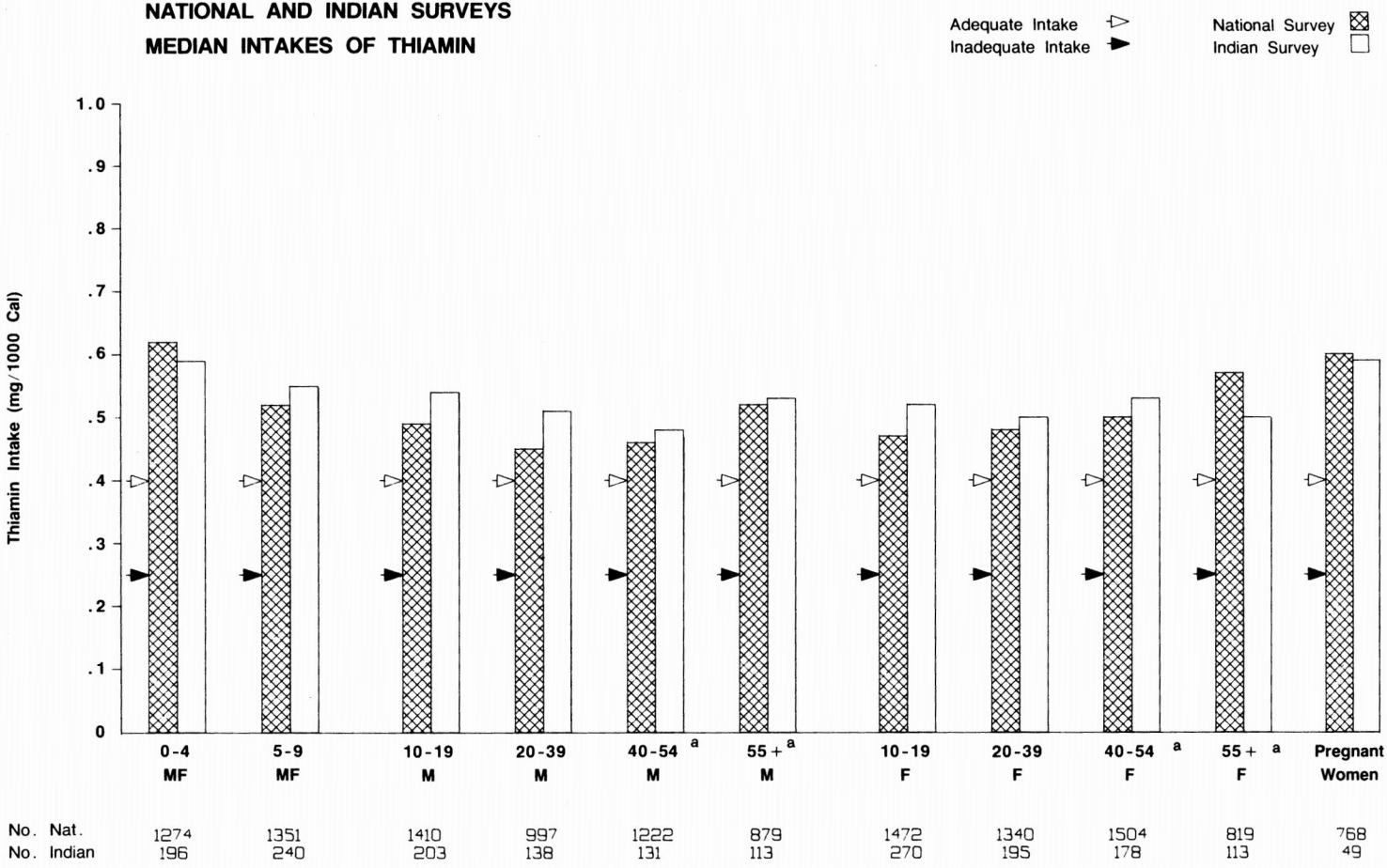
The dietary intakes of thiamin, riboflavin and niacin are given in mg/1,000 Cal (Tables 7.2, 7.10 and 7.18) and in mg/day (Tables 7.4, 7.12 and 7.20), and the median intakes in mg/1,000 Cal are shown with the corresponding national data in Figures 7-1, 7-3 and 7-5. The median intakes were above or equal to the adequate standards in all groups except women over 54 years of age in whom the thiamin and riboflavin intakes in mg/day were in the marginal range.

The urinary excretions of thiamin and riboflavin are given in Tables 7.6 and 7.14 and the percentages indicating risk of deficiency are given in Tables 7.8 and 7.16 and Figures 7-2 and 7-4. Few of the thiamin excretion values were classified at high risk but substantial percentages of the adult men and smaller percentages in other groups were classified at moderate risk. Only isolated values for riboflavin excretion were classified at high or moderate risk.

Figure 7-1

NATIONAL AND INDIAN SURVEYS

MEDIAN INTAKES OF THIAMIN



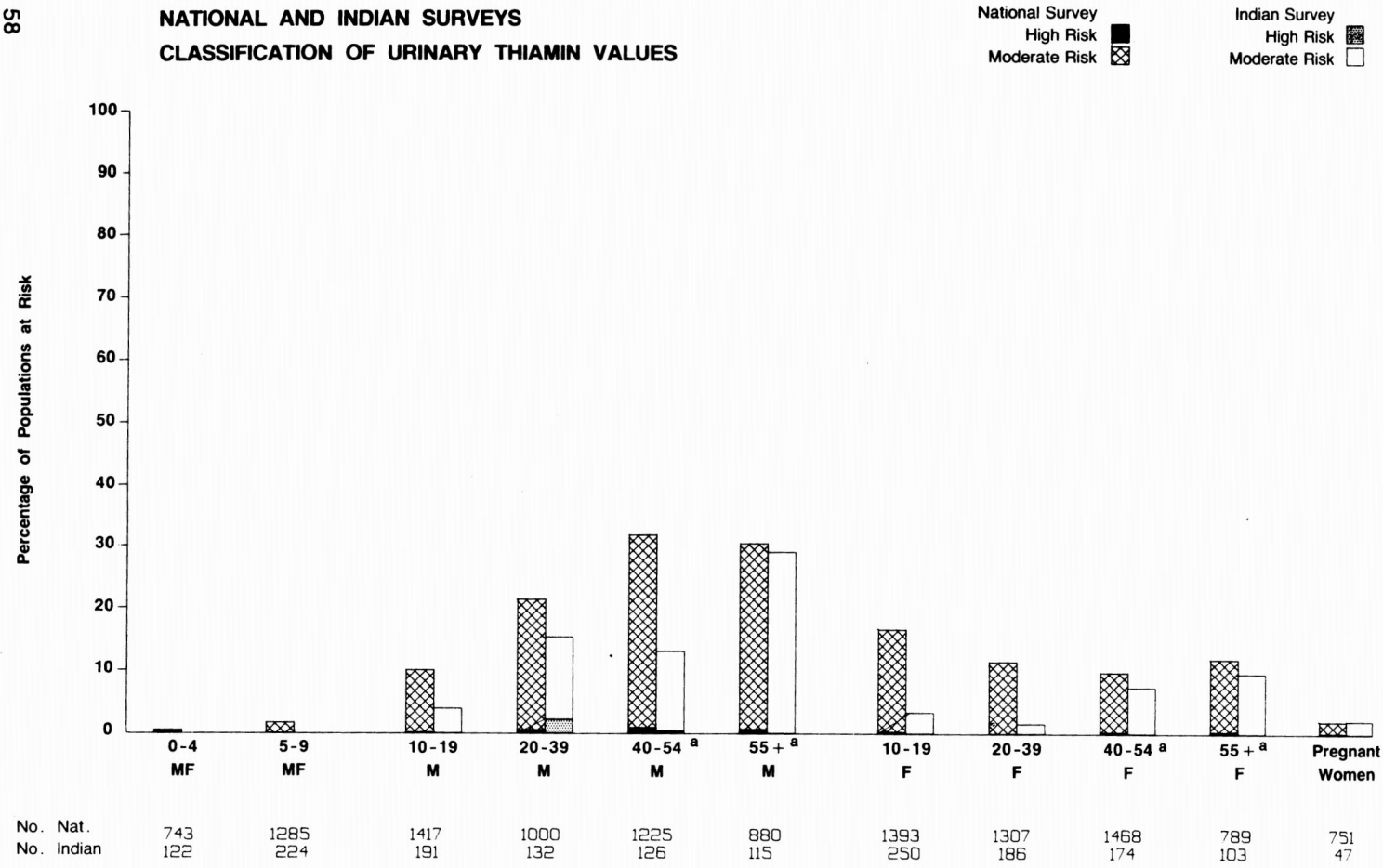
	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M [a]	55+ M [a]	10-19 F	20-39 F	40-54 F [a]	55+ F [a]	Pregnant Women
No. Nat.	1274	1351	1410	997	1222	879	1472	1340	1504	819	768
No. Indian	196	240	203	138	131	113	270	195	178	113	49

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 7-2

NATIONAL AND INDIAN SURVEYS

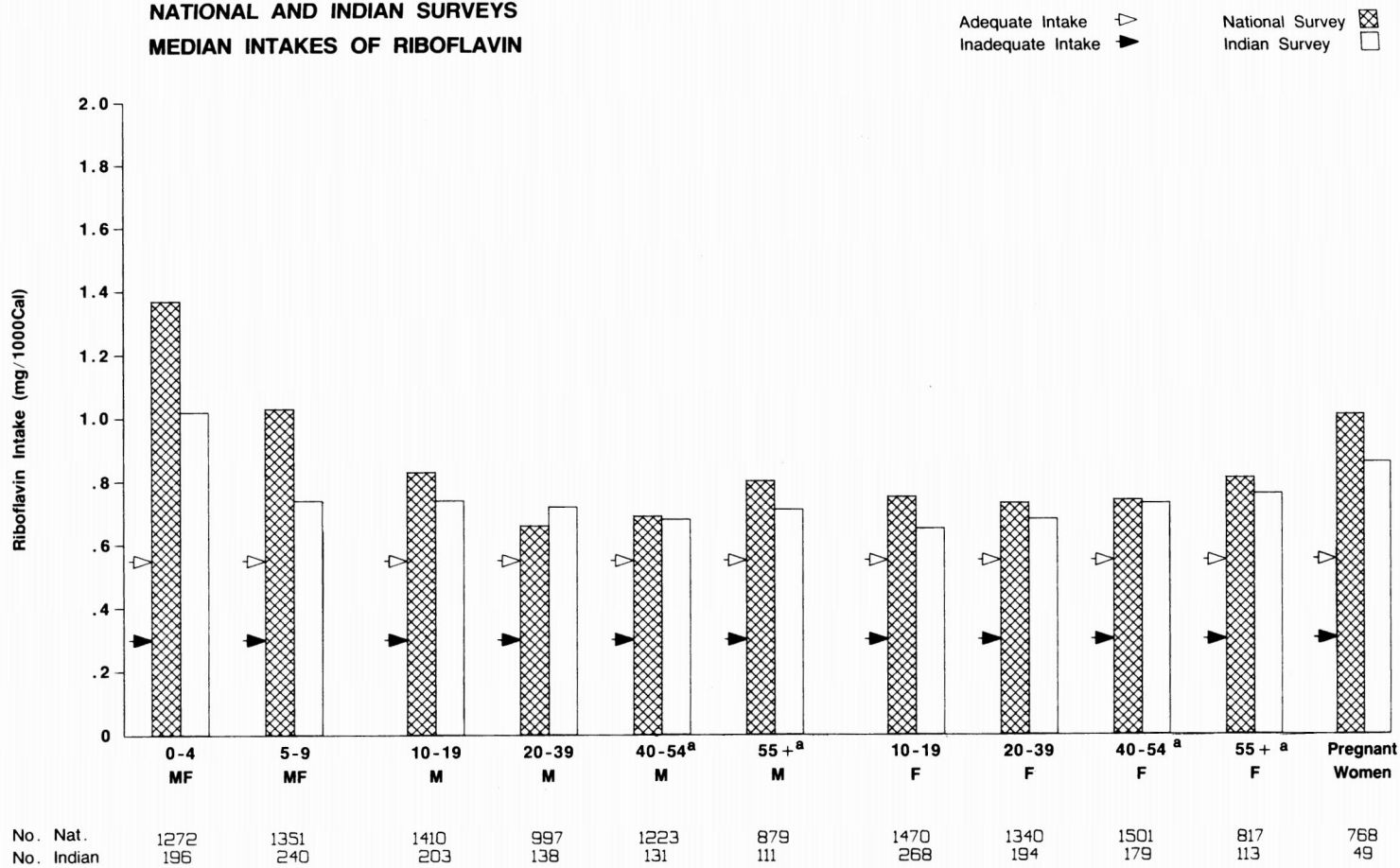
CLASSIFICATION OF URINARY THIAMIN VALUES



[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 7-3

NATIONAL AND INDIAN SURVEYS
MEDIAN INTAKES OF RIBOFLAVIN

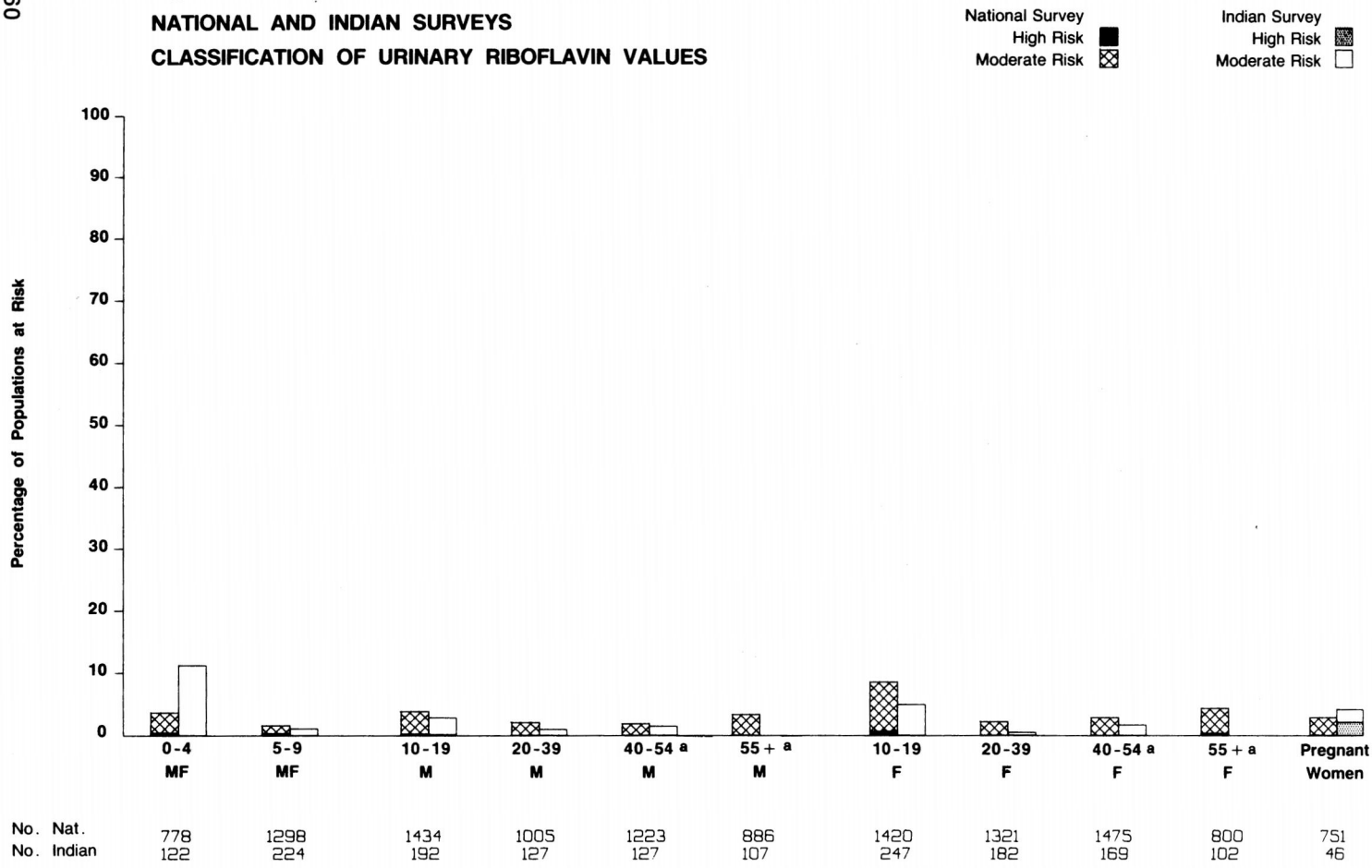


[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 7-4

NATIONAL AND INDIAN SURVEYS

CLASSIFICATION OF URINARY RIBOFLAVIN VALUES



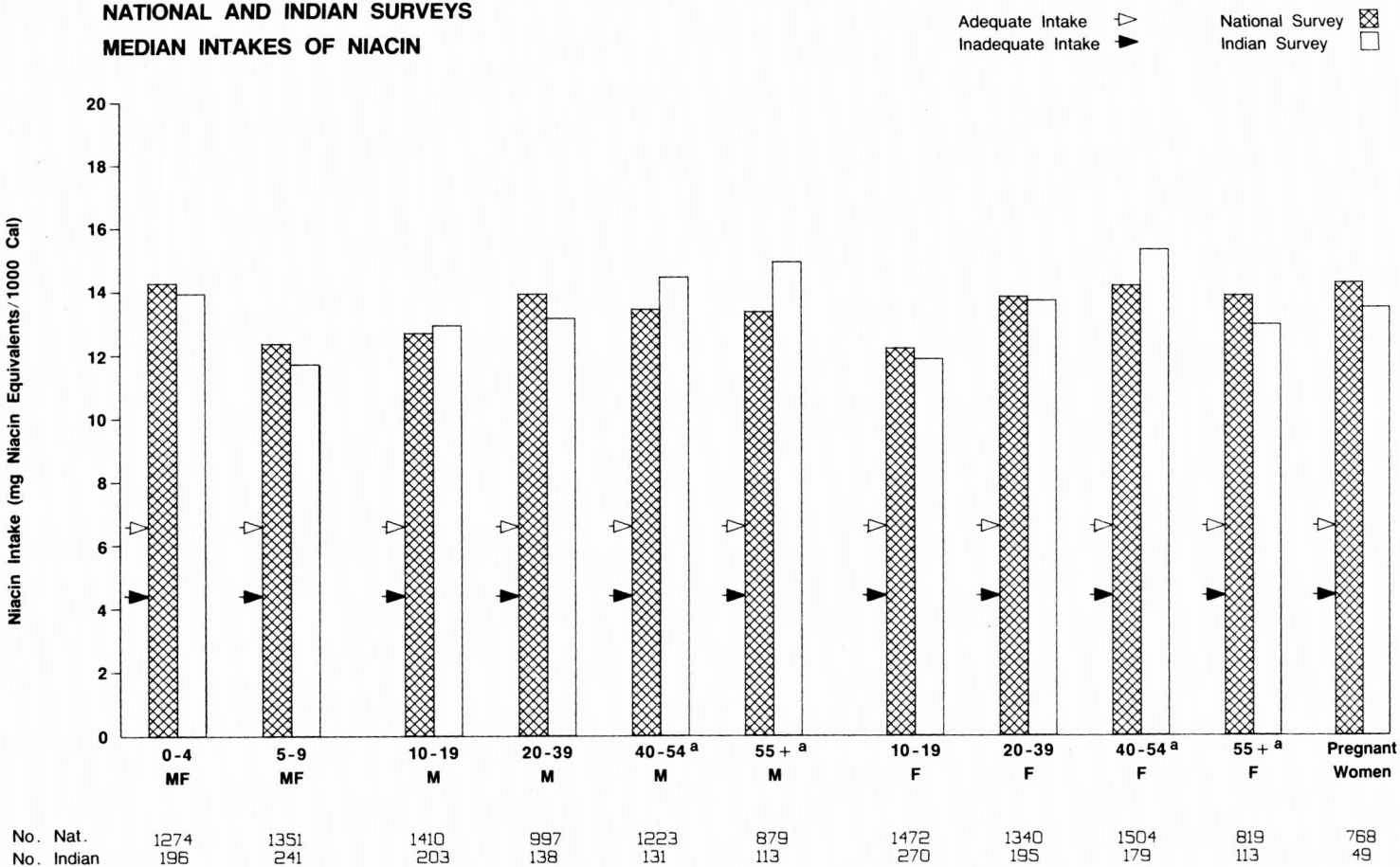
	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 a M	55 + a M	10-19 F	20-39 F	40-54 a F	55 + a F	Pregnant Women
No. Nat.	778	1298	1434	1005	1223	886	1420	1321	1475	800	751
No. Indian	122	224	192	127	127	107	247	182	169	102	46

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 7-5

NATIONAL AND INDIAN SURVEYS

MEDIAN INTAKES OF NIACIN



[a]In National Survey (40-64 M&F, 65 + M&F).

7.4 SUMMARY

The dietary recalls indicated that the diets of most Canadians contained adequate amounts of thiamin and riboflavin and an abundance of niacin and tryptophan. The diets of Eskimos provided even larger quantities than found in the Indian and provincial populations. As expected, the groups consuming relatively small amounts of food had the least satisfactory intakes of these vitamins. This was especially true for middle-aged and elderly women.

Small interprovincial differences in median intakes were noticed. The median intakes of niacin (mg niacin equivalents/1,000 Cal) in Newfoundland, for example, were consistently lower than in other parts of Canada, yet the thiamin intakes were unusually high. In contrast, the intakes of both thiamin and riboflavin were relatively low in Quebec. The explanation of these minor differences will probably be found in the forthcoming study of food consumption.

Few of the excretion values of thiamin indicated a high risk of deficiency. The prevalence of moderate risk values of thiamin was, however, inexplicably high in adult men in the national and Indian samples and requires further investigation. In Eskimos, moderate risk values were found only in elderly women. There was little evidence of riboflavin deficiency based on the urinary excretion levels but the prevalence of moderate risk values in the national sample was highest in teenage girls. In the Indian survey, moderate risk values were prominent in children under 5 years of age.

Absent tendon reflexes and lesions of the tongue, lips and eyelids occurred more frequently among the elderly than among other groups. Although the clinical signs could not be unequivocally ascribed to specific vitamin deficiencies (see Chapter 15), they did reinforce the concern expressed about the dietary intakes of the elderly.

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CHAPTER 8 – ASCORBIC ACID

8.1 INTRODUCTION

Ascorbic acid (vitamin C) is an important factor in normal cell function. It serves as a regulatory cofactor in the metabolism of some amino acids and folacin, in iron transport, and is essential in the synthesis of connective tissue constituents such as collagen and intercellular cement substance.

The significant dietary sources of ascorbic acid are fruits, vegetables and liver. It is readily available and absorbed from these foods. Citrus fruits are generally regarded as the best source although many fresh vegetables such as broccoli contain large amounts of ascorbic acid. However, the vitamin is unstable and inappropriate storage and processing methods, such as overcooking or long periods of contact with air, can reduce the ascorbic acid content of these foods.

A severe dietary deficiency of ascorbic acid causes scurvy. In infancy, scurvy is characterized by lassitude, anemia, hematomas, painful limbs and joints, and beading of ribs (scorbutic rosary) (1,2).

Early studies (3,4) showed that normal adult men developed overt signs of scurvy after consuming a deficient diet for between 160 and 200 days. However, recent studies in the U.S. demonstrated that clinical symptoms developed in adults on a deficient diet in less than 90 days. The principal signs were hyperkeratinization or hardening of the follicles, hemorrhagic manifestations such as easy bruising and petechial (pinpoint) hemorrhages, fatigue, muscular aches and pains, swollen joints, bleeding gums and edema. The first sign to appear was petechial hemorrhage (5). A further finding of interest was the clear evidence of mental symptoms (hypochondriasis, depression and hysteria) which occurred long before the recognized clinical symptoms of scurvy became apparent (6).

Isolated cases of scurvy in adults have been observed (7) but scurvy is no longer regarded as a major public health problem (8). However, evidence of vitamin C deficiency in artificially fed infants was commonly seen in Canada as recently as 1963, before the supplementation of artificial formulas was initiated (9,10,11). Clinical signs suggestive of ascorbic acid deficiency were also found in other age groups in Newfoundland (12,13), in the Gaspe Peninsula (14) and in Indian communities (15,16).

Recent studies (17,18) showed that when the tissues are saturated, the total body pool of vitamin C in man was only about 1.5 g. This was attained after consumption of 77.5 mg of ascorbic acid daily for 13 days. At this

level, any excess intake was excreted and, when the subjects were deprived of ascorbic acid, the pool was utilized at a daily rate of 2.2 to 4.1%.

When the tissues are saturated, serum levels do not rise above about 1.5 mg/100 ml. On the other hand, when dietary intake is inadequate, serum levels fall quite rapidly. In children, serum levels below 0.6 mg/100 ml were found with intakes below 30 mg daily (19). While there is some evidence of a sex difference in serum levels (20,21), the data are too limited to allow any firm conclusions to be drawn. Experience with adolescents and adults suggests that a serum level in excess of 0.4 mg/100 ml is indicative of an adequate intake of ascorbic acid (22,23,24,25).

Information on serum changes in pregnancy and lactation is fragmentary. Some investigators have reported no significant change whereas others have reported a downward trend. Two major studies conducted in the U.S. (26,27) reported that non-pregnant women had higher values than pregnant women; there was a slight decline throughout pregnancy followed by a sharp fall postpartum. Lactating women had much lower values, which remained below 0.3 mg/100 ml even when the intake was greater than 120 mg. A highly significant drop in the mean serum vitamin C level in the third trimester of pregnancy has been observed in other studies (28) with 45% of the values below 0.4 mg/100 ml plasma. The significance of these changes has not been determined.

8.2 NATIONAL RESULTS

The distributions of dietary intakes of ascorbic acid are presented in Table 8.1 and, for infants under 1 year of age, in Table 16.6.

The median intakes exceeded the standards in all physiological groups by a substantial margin (Figure 8-1). Among males the highest median intake was observed in the 20-39 year group and the lowest in the elderly. In females the median values did not decrease with age. An unusually high median intake was observed in the pregnant women: a large percentage of the values in this group was in excess of 100 mg.

The distributions of serum vitamin C reveal a remarkable spread of values (Table 8.3). A drop in median values was apparent in males, particularly in the older groups. Women had lower median serum levels than children but the values in middle-aged and elderly women were higher than in comparable male groups. The highest median serum levels were found in children under 10 years of age.

Substantial proportions of adults were classified at high risk on the basis of serum vitamin C levels (Table 8.5 and Figure 8-2); the prevalence of high risk values was particularly high (15.6%) in elderly men.

Only small percentages of the children, adolescents and pregnant women had values at high risk but large proportions of these and other groups were classified at moderate risk.

No evidence of frank scurvy was found but some clinical signs, which might be associated with inadequate vitamin C status, were observed and they were especially common among Eskimos. Detailed discussion of the significance of the clinical findings is presented in Chapter 15.

There were few consistent differences between seasons or among population densities in the parameters of ascorbic acid status.

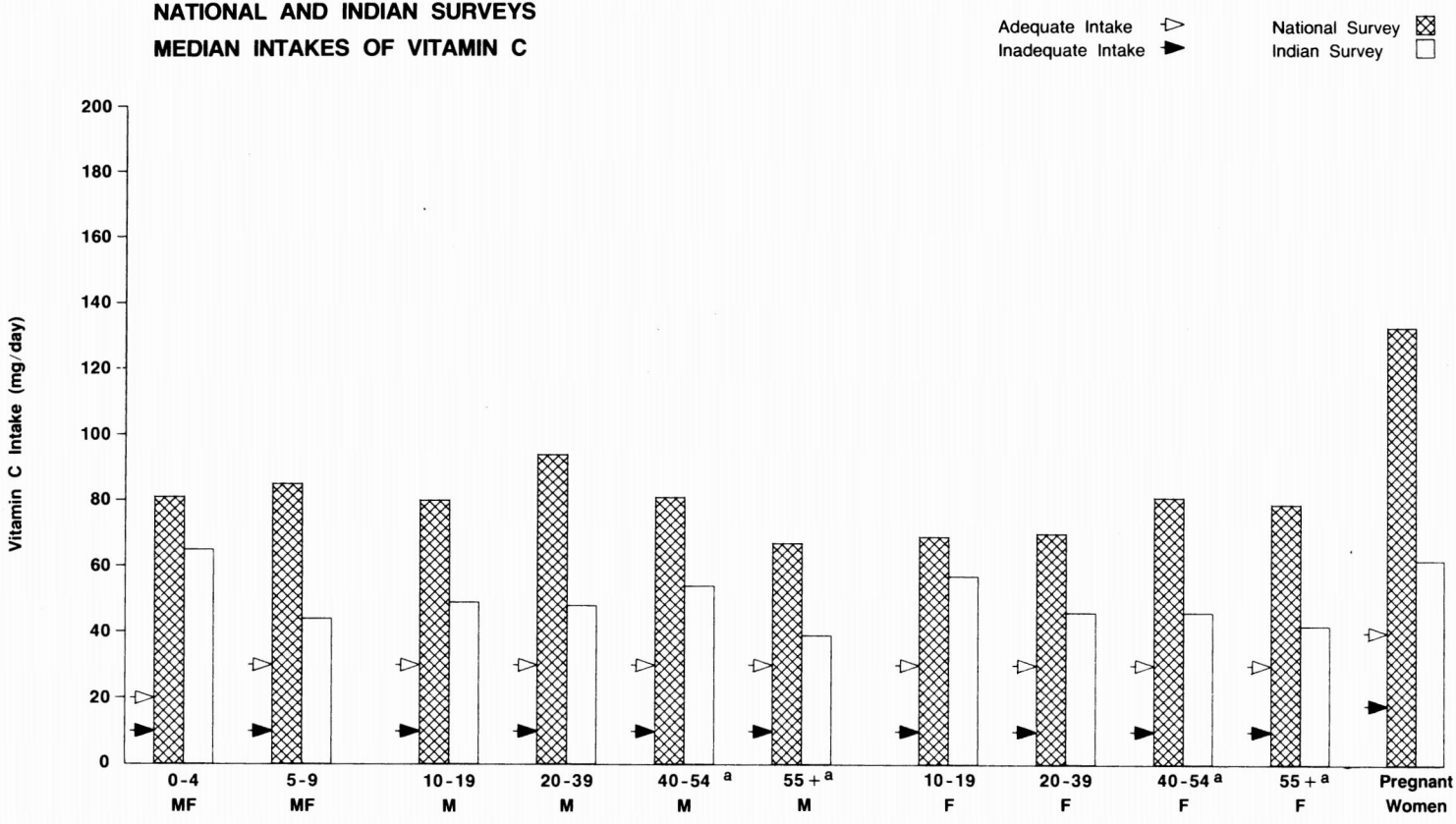
8.3 INDIAN RESULTS

The results for the Indian survey are presented in Tables 8.2 and 8.7 and Figure 8-1 (dietary ascorbic acid) and Tables 8.4 and 8.6 and Figure 8-2 (serum vitamin C).

The median dietary intakes in Indians fell below those observed in the national sample but were above the standards of adequacy.

The risk classification of the serum vitamin C values showed that the situation in Indian children and teenagers was very similar to that observed in the national sample. The percentage of adult Indians in risk categories was, however, much higher than in the national sample: between 40 and 70% of adults were classified at risk. The percentages of Indians classified at high risk were consistently higher among those Indians living in areas remote from urban centres (Table 8.6). The median vitamin C intakes of Indians in remote areas were also considerably below those of Indians living close to urban centres (Table 8.7) and the close agreement between the dietary and biochemical findings supports the conclusion that Indians in remote areas have an increased risk of developing vitamin C deficiency.

Figure 8-1
NATIONAL AND INDIAN SURVEYS
MEDIAN INTAKES OF VITAMIN C



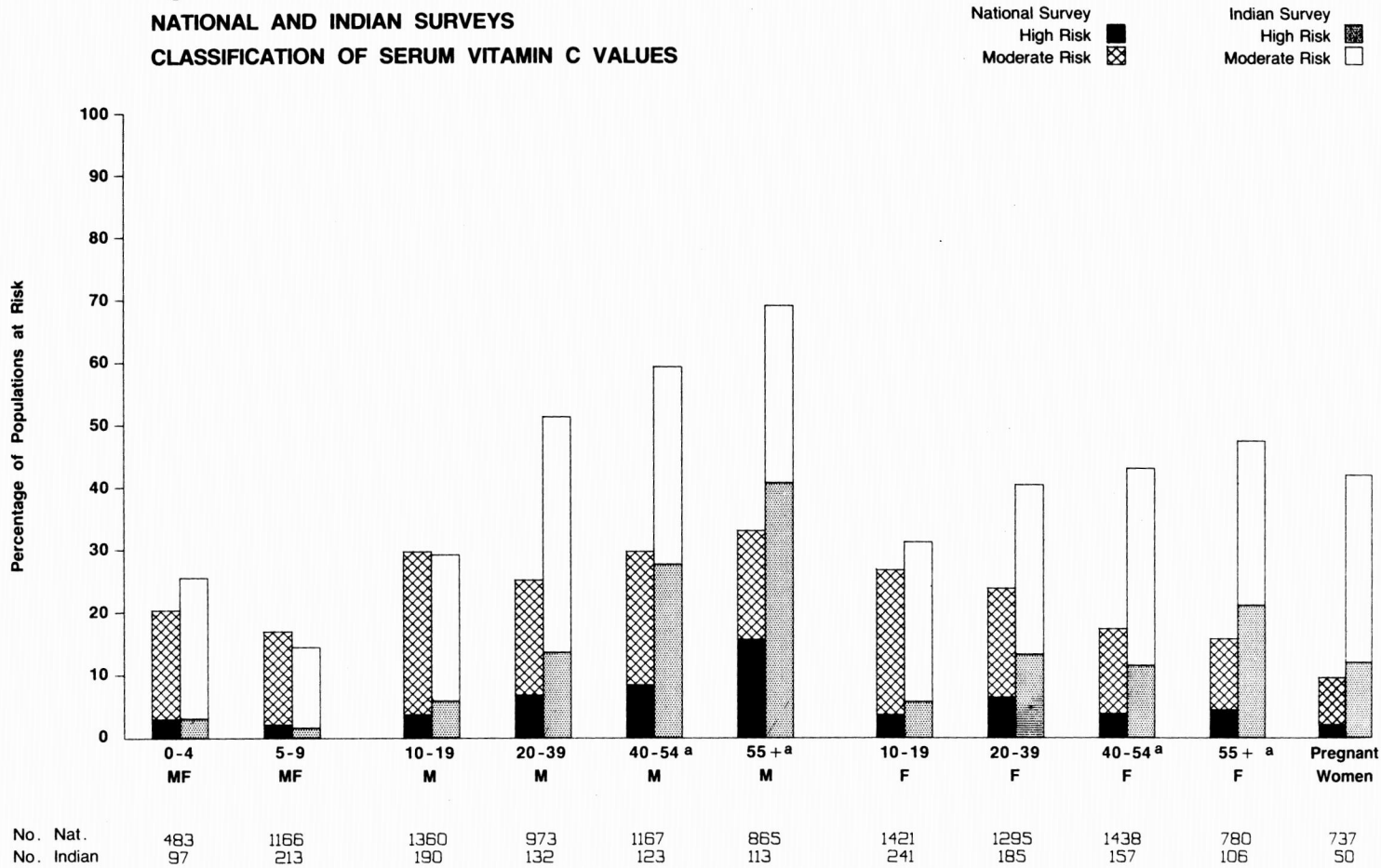
	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 a M	55 + a M	10-19 F	20-39 F	40-54 a F	55 + a F	Pregnant Women
No. Nat.	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
No. Indian	196	241	203	138	132	113	270	195	179	113	49

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 8-2

NATIONAL AND INDIAN SURVEYS

CLASSIFICATION OF SERUM VITAMIN C VALUES



[a]In National Survey (40-64 M&F, 65 + M&F).

8.4 SUMMARY

The dietary data showed that the median vitamin C intakes of all groups in the national sample were adequate. There was a wide range of reported intakes in the national sample and some of the high values undoubtedly resulted from the use of supplements. Median intakes among Indians were also satisfactory although noticeably below those observed in the national sample. The lowest median intakes were observed in the Eskimos and most were below the adequate standard.

The elderly had the lowest levels of serum vitamin C, and, in the national sample, the greatest percentage at high risk. It is possible that in the elderly the low serum levels are a normal consequence of ageing; on the other hand, they could reflect poor nutrition. Middle-aged and elderly women in the national sample had higher serum levels than men in comparable age groups although the median intakes of vitamin C were similar. This finding may be a consequence of a sex difference in the metabolism of ascorbic acid.

In Eskimos the majority of adults were classified at high risk; in Indians the prevalence was midway between that of the national and Eskimo samples. Indians in remote areas had lower serum levels and lower intakes than Indians in areas close to urban centres. Current analysis does not permit firm conclusions concerning the significance of low serum vitamin C levels. Further analysis of the results will reveal whether there are any correlations between individuals with low serum vitamin C levels and low dietary intakes of vitamin C. There may also be relationships between low serum vitamin C levels and other parameters, such as hemoglobin and serum folate.

No overt clinical signs of vitamin C deficiency were observed in the national sample although diffuse bleeding of gums was commonly observed in adults in the 20-39 year-old group. Whether this lesion was attributable to inadequate vitamin C status or periodontal disease requires further study. However, in Indians and particularly in Eskimos, this lesion was observed so frequently in all adult groups that it suggests, in view of the biochemical evidence, that vitamin C deficiency is a problem of clinical significance. Measures to improve the vitamin C status of Indians and Eskimos are urgently needed.

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CHAPTER 9 – VITAMIN A

9.1 INTRODUCTION

Vitamin A has a multiplicity of functions, but only a role in vision is well understood. The vitamin is needed for the normal development of many epithelial tissues, including those that line the respiratory and digestive tracts, numerous glands and their ducts and the surface of the eye. Experiments with animals have revealed that vitamin A has other functions: it controls the growth of bones; it maintains spermatogenesis; it has a role in the placenta and fetus during pregnancy; and it affects the ability to resist infections.

Retinol and its derivatives, and other forms of vitamin A, occur only in foods derived from animals. Milk and dairy products contain relatively modest amounts but nevertheless provide a large part of the vitamin A in most North American diets. Some brands of margarine and skim milk are fortified with retinyl esters in order to be satisfactory substitutes for butter and whole milk.

Large amounts of retinol, in esterified form, are present in extracts of fish liver and viscera, such as cod liver oil and halibut liver oil. Liver from farm animals is also rich in vitamin A (1). The remaining important sources of vitamin A activity are a special group of carotenoid pigments, which are converted enzymically to retinol in the intestine wall. The most active carotenoid in this respect is β-carotene, which occurs with other provitamins in many fruits and vegetables, and in eggs and milk (2).

The photosensitive pigments in the eye consist of a metabolite of retinol attached to a protein. The pigments cannot be produced or replaced at normal rates when vitamin A is deficient in the tissues. The retina then becomes less sensitive to light, resulting in night blindness (3). The epithelial tissues are normally bathed in mucous or other secretions but during vitamin A deficiency they become dry, keratinized and susceptible to infection. This change, called keratinizing metaplasia, has a disastrous effect on the cornea and conjunctiva and can cause blindness. The deficiency syndrome characterized by changes in the surface structures of the eye is xerophthalmia. The initial dryness and keratinization of the conjunctiva and cornea is known as xerosis; a more advanced lesion in the cornea involving necrosis is keratomalacia.

Other clinical signs sometimes attributed to vitamin A deficiency are follicular hyperkeratosis, and wrinkling and dryness of the skin, although these can also result from non-nutritional factors (4).

Mixed diets usually vary widely in their vitamin A content from day to day. When large amounts of the vitamin are consumed, much of the surplus

over the immediate requirements is retained in the liver. This store is utilized when the intake from the diet is inadequate.

The vitamin is transported by a special plasma protein and the concentration of the vitamin in blood, in contrast to that in liver, remains relatively constant. When vitamin A is absent from the diet, the level in blood is maintained by controlled mobilization of the liver reserve and it falls precipitously when the stores are finally exhausted.

Vitamin A deficiency disease occurs in many developing countries where it is a common cause of permanent blindness (5). It primarily afflicts infants and children and is often associated with protein-calorie malnutrition or infections. The severe disease is rarely seen in North America although it occasionally occurs because of alcoholism, digestive diseases or food faddism.

The occurrence of early signs of vitamin A deficiency in Canadians has been reported in numerous surveys. Night blindness was apparently common in Newfoundland in the early part of this century (6,7). In a survey in Newfoundland in 1944, xerosis of the conjunctiva was observed in 77% of the participants and the lesion was severe in 14%; follicular lesions were common; and xerosis of the skin was apparent in 3% of those examined. The vitamin A levels in 47% of the serum samples were below 20 μg retinol/100 ml (8). A second survey was undertaken in 1948 after substantial changes had occurred in the economy of the island and nutritional programs, including the fortification of margarine with vitamin A, had been instituted. The prevalence of the eye and skin lesions was significantly reduced and only 2% of the blood retinol values were below 20 μg/100 ml (9).

A dramatic increase in blood vitamin A values was also observed in children in an isolated Indian and Metis settlement in Saskatchewan. The change occurred between 1958 and 1960 when vitaminized foods were added to the diet (10).

In a survey of children in British Columbia during 1946, skin lesions attributable to vitamin A deficiency were observed in 6.4% of the group but the diagnosis was considered to be "definite" in only 0.5%. Similar results were obtained in a parallel survey in Saskatchewan (11). Evidence of vitamin A deficiency was found in only one child in a survey in the Gaspe peninsula in 1945 (12). Thickening of the conjunctiva and folliculosis were common findings in a survey of 492 James Bay Indians in 1947 but hyperkeratosis was seen in only two individuals and xerosis was observed only once (13). No "definite" vitamin A deficiency was observed in a survey in Nova Scotia during 1947 but 2.5% were diagnosed as "probably" deficient (14). The combined prevalences of definite and probable deficiency were reported to be 8% in Timmins, Ontario,

3.4% in Lewis County, Quebec and 1.6% in Brome-Missisquoi County, Quebec (15).

The liver vitamin A reserves of Canadians were assessed for the first time in 1968. Samples of liver from necropsies in five Canadian cities were analyzed for vitamin A. The vitamin A concentration was less than the minimum satisfactory level (40 μg retinol/g) in 20% of the livers from victims of accidents (16).

9.2 NATIONAL RESULTS

The intakes of vitamin A, expressed as retinol equivalents, are given in Table 9.1 and, for young children, in Table 16.6. The interpretation of the data from the 24-hour recall was especially difficult for vitamin A. The values, as expected, varied over a wide range and the mean for each group was 1.3 to 1.8 times the median. The mean values were noticeably affected by extreme intakes which ranged beyond 5,000 μg in up to 4.3% of each physiological group. Such high values, although few in number, must be considered in the appraisal of the findings because they make substantial, albeit erratic, contributions to the liver stores of many individuals. The highest mean and median intakes were observed in the pregnant women, probably because many in this group took vitamin supplements.

The median intakes, as shown in Figure 9-1, were in excess of the standards in all of the groups except in the middle-aged and elderly women. In these groups the median values were in the marginal range.

The distribution of the serum vitamin A values is given in Table 9.3 and the percentages of the groups classified at risk are given in Table 9.5 and Figure 9-2. The data from the survey revealed that the serum levels were related to the age and sex of the individual. It has not yet been established whether these age-sex differences reflected normal physiological characteristics or whether they represented differences in the vitamin A status of the groups. The difference in serum levels between the sexes has been noted by other researchers (1). The nature of these relationships is illustrated in Figure 9-3 in which the median values for the national sample are plotted for each year up to the age of 75. The values increased with age in males until the early thirties and then decreased in the late sixties. In females, the levels were lower than in males and the increase with age was temporarily arrested between the ages of 20 and 40 years. As the standard did not allow for these differences, more individuals were classified at moderate risk on the basis of serum vitamin A values among the younger age groups and among the females than in other groups. Few individuals (less than 0.2%) in any group, however, were classified at high risk.

Follicular hyperkeratosis was observed in all age groups and it was especially common in children and teenagers (see Chapter 15 for details on clinical findings). Thickened opaque bulbar conjunctivae were observed predominantly in the middle-aged and elderly. However, none of the observed lesions were considered to be indicative of a deficiency of vitamin A.

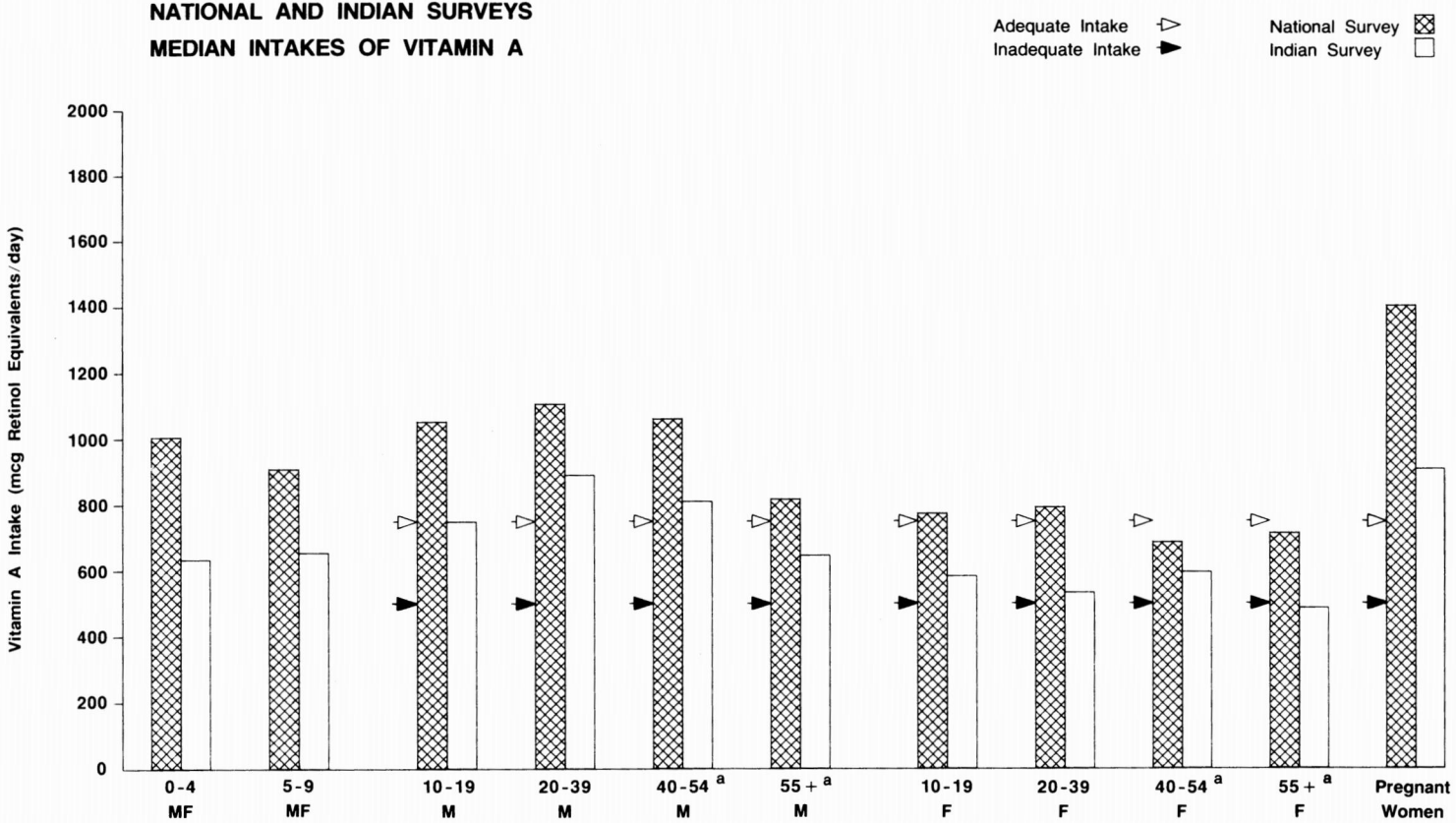
9.3 INDIAN RESULTS

The results for Indians are given in Tables 9.2, 9.4 and 9.6. The dietary intakes tended to be lower than those in the national sample and this difference was reflected in the median values (Figure 9-1). The median values were in the marginal range in children and teenagers, all women and the elderly men. The median dietary intakes of elderly women were in the inadequate range. The serum vitamin A levels tended to be lower in Indians than in the provincial surveys. No serum values, however, were classified as indicating high risk.

Figure 9-1

NATIONAL AND INDIAN SURVEYS

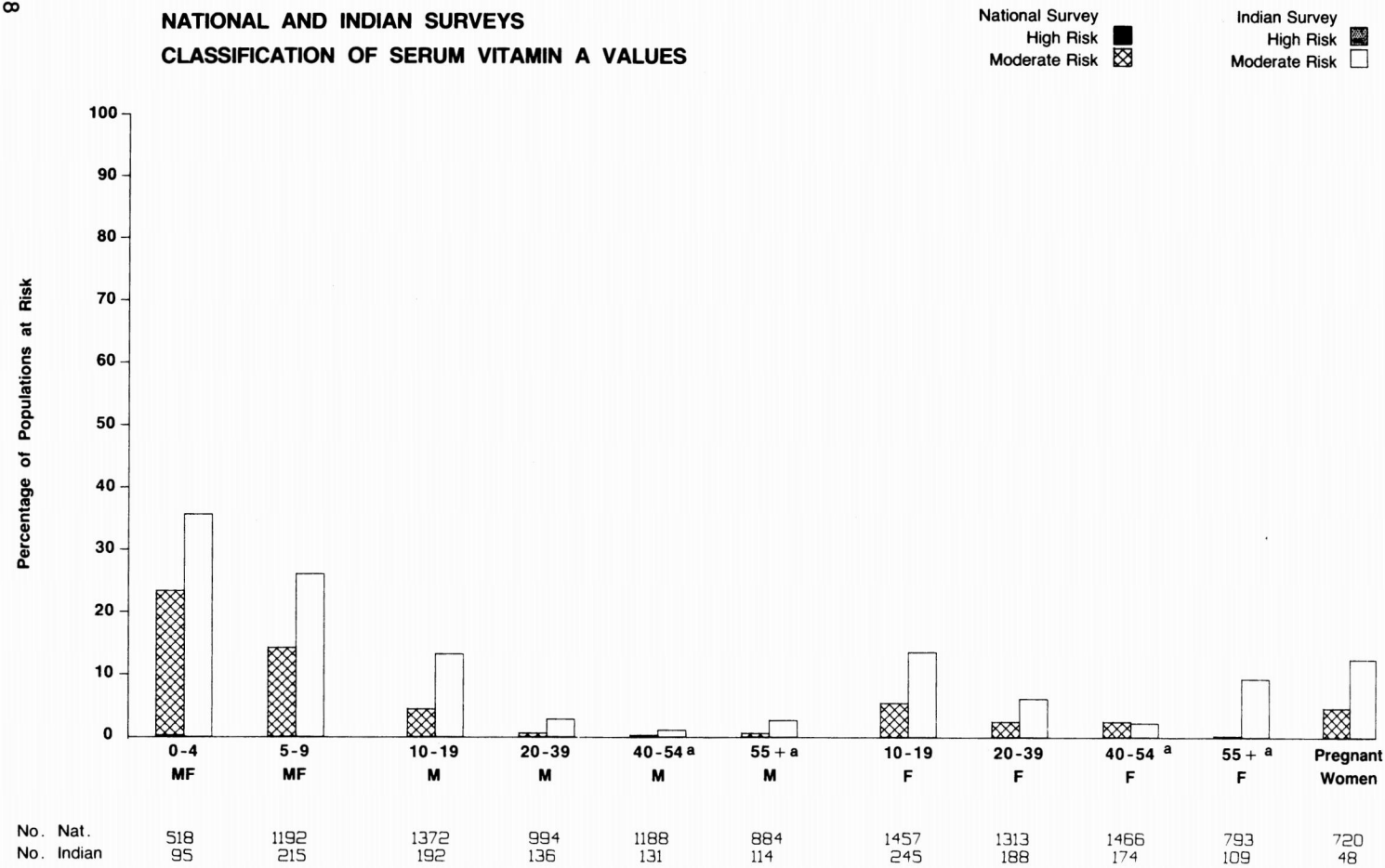
MEDIAN INTAKES OF VITAMIN A



	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 a M	55 + a M	10-19 F	20-39 F	40-54 a F	55 + a F	Pregnant Women
No. Nat.	1225	1315	1374	962	1190	849	1435	1303	1456	790	662
No. Indian	196	241	203	138	132	113	270	195	179	113	49

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 9-2
NATIONAL AND INDIAN SURVEYS
CLASSIFICATION OF SERUM VITAMIN A VALUES

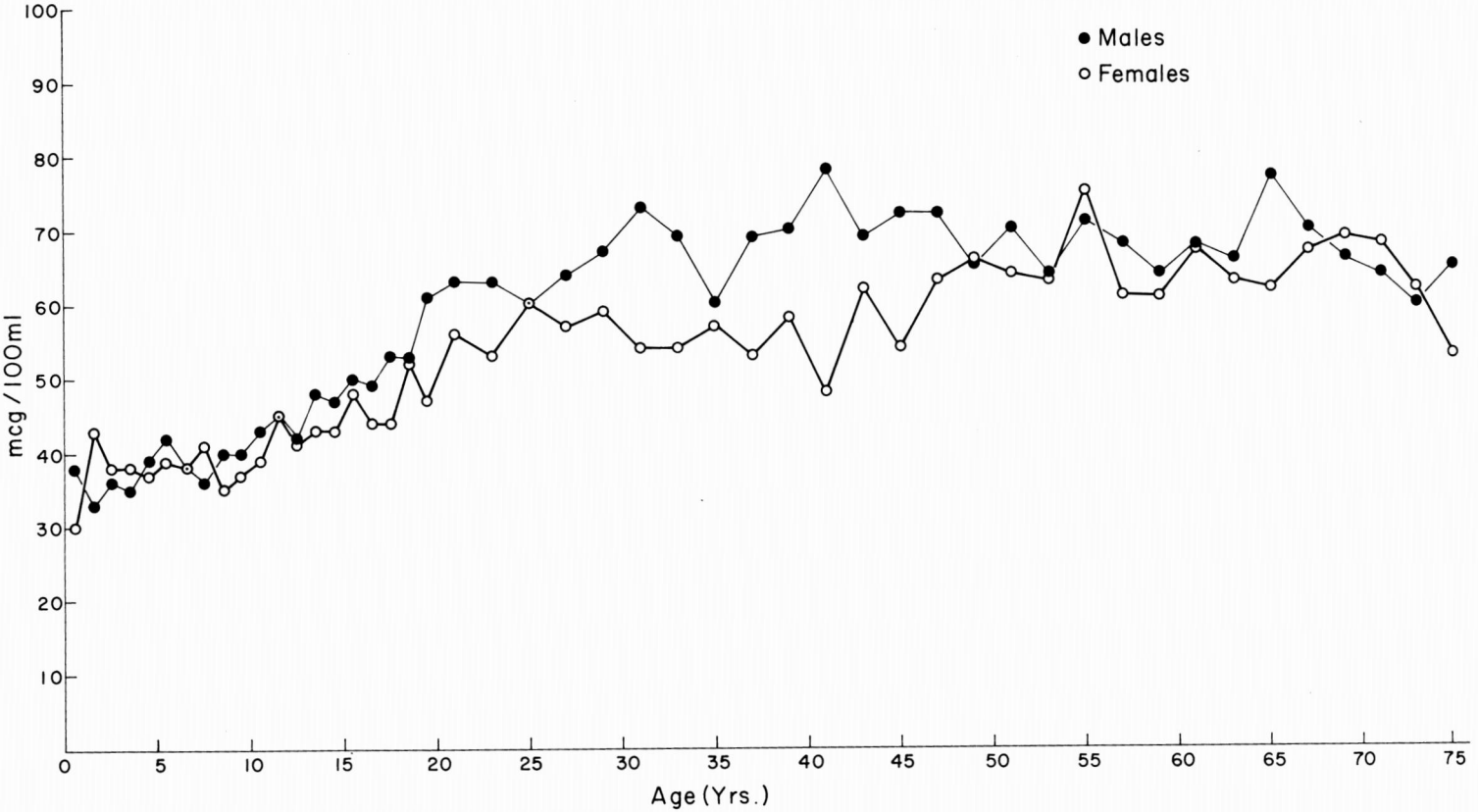


	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 a M	55 + a M	10-19 F	20-39 F	40-54 a F	55 + a F	Pregnant Women
No. Nat.	518	1192	1372	994	1188	884	1457	1313	1466	793	720
No. Indian	95	215	192	136	131	114	245	188	174	109	48

[a]In National Survey (40-64 M&F, 65 + M&F).

FIGURE 9-3

NATIONAL SURVEY
MEDIAN VALUES OF SERUM VITAMIN A



9.4 SUMMARY

No evidence of frank vitamin A deficiency disease was obtained in the survey. The serum vitamin A levels were below 10 μg/ml in only isolated samples and eye lesions unequivocally attributable to avitaminosis A were not observed. It is recognized, however, that deficiency to the degree of producing night blindness would not have been detected in the clinical examinations. Moreover, experiments with animals have indicated that the serum vitamin A levels are generally unrelated to the magnitude of the liver stores and they fall to low values only when the liver reserves are completely exhausted.

Although the dietary data concerning vitamin A were singularly difficult to interpret, the dietary recalls of many individuals were compatible with previous observations that the liver stores of some Canadians are poor (16). In all the provincial surveys, the dietary intakes varied among the different physiological groups in a consistent fashion and most groups had adequate median intakes. Females, especially the middle-aged and elderly, usually had the lowest intakes and the median values were generally in, or close to, the marginal range of the interpretive standard. The marginal range of the standard itself was not far removed from the minimum requirements and it would, if achieved, probably permit only modest liver storage.

Indians had lower dietary intakes than the national sample and also lower median serum vitamin A levels with a corresponding increase in the proportion of serum values classified at moderate risk. In Indians, as in the national sample, there was no biochemical or clinical evidence of frank vitamin A deficiency but the dietary data indicated that many of the intakes were only marginally adequate. It is concluded that the liver reserves of Indians were poor.

The lowest dietary intakes were recorded in Eskimos. They were far below those observed in the national and Indian samples and, for most groups, were below the inadequate standard. It is therefore reasonable to infer that the liver stores of Eskimos were very low. None of the serum levels of vitamin A among Eskimos were in the high risk category but the median values were consistently below those of Indians and the national sample.

The vitamin A status of most of the Canadians encountered in the provincial surveys was adequate but the status of Eskimos and Indians was clearly cause for concern. The existence of dangerously low vitamin A intakes among Eskimos is at variance with the popular concept that the Eskimo diet includes fish and other marine animals which are especially rich sources of the vitamin. Unfortunately they do not appear to be eating adequate amounts of the food groups, such as fruits, vegetables and dairy products, that are good sources of vitamin A. If the characteristic intake of vitamin A in Eskimos is only a recent development that stems from a transition in dietary habits, then the

absence of overt clinical signs of vitamin A deficiency may be only temporary. A closer examination of the vitamin A status of Eskimos is therefore warranted as remedial action may be urgently needed.

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CHAPTER 10 – VITAMIN E

10.1 INTRODUCTION

The Vitamin E group contains eight fat-soluble substances; there are four tocopherols and an equal number of tocotrienols. Usually, only the most active member of the group, α-tocopherol, is considered in dietary calculations.

There are several theories concerning the mode of action of Vitamin E. A widely accepted view is that vitamin E is a biological antioxidant which protects sensitive substances and structures in the tissues.

Vitamin E is widely distributed in varying concentrations in foods from animal and vegetable sources. The richest dietary sources of vitamin E are the vegetable oils and products derived from them such as salad dressings and vegetable oil margarines (1). Foods such as dairy products, leafy vegetables and meats, if consumed in liberal amounts, are also significant sources of this nutrient.

Vitamin E deficiency diseases occur spontaneously in poultry and other farm livestock and they have been produced experimentally in laboratory animals. Often they are complicated nutritional disorders that involve deficiencies of the trace element selenium and excessive intakes of unsaturated fats. A variety of lesions have been observed in vitamin E deficient animals, including anemia, sterility, brain disorders, liver damage, and muscular dystrophy (2).

Little is known about the effects of vitamin E deficiency on humans. There is relatively little placental transfer of α-tocopherol and consequently infants are born with low stores of vitamin E in their tissues. The deficiency is rapidly corrected when the infant is breast fed, since human colostrum is rich in vitamin E (3).

The vitamin has been demonstrated to have a beneficial effect on a megaloblastic anemia found in protein malnourished infants and a hemolytic anemia in premature infants (4). Changes that could indicate vitamin E deficiency, such as shortened red cell survival time, deposition of ceroid pigment in smooth muscle, and degenerative changes in muscle fibres, have been observed in patients suffering from intestinal malabsorption. However, no definite evidence of improvement in these conditions has been obtained after treatment with vitamin E (5). Large doses of vitamin E are sometimes recommended for the treatment of cardiovascular and other diseases although well controlled clinical trials have failed to demonstrate any significant beneficial effect (6).

α-tocopherol is carried in blood with the lipoproteins and it is distributed evenly throughout all the tissues in the body. The blood level is used as an index of the vitamin E status and values below 5 μg/ml are usually considered to indicate inadequate intake (7). It now appears, however, that the blood levels are positively correlated not only to the vitamin E content of the diet but also to the lipoprotein content of the blood (8). In women, serum vitamin E and lipoprotein levels are also affected by pregnancy since levels of both rise as gestation progresses (9).

In previous surveys, the mean blood levels in adults were 12.9 μg/ml in Ottawa (10) and 9.7 μg/ml in Vancouver (11). None of the values in the survey in Ottawa were in the deficiency range but in Vancouver, 1.8% of the participants had values below 5 μg/ml.

10.2 NATIONAL RESULTS

Vitamin E status was assessed from measurements of the serum tocopherol levels and the distribution of the values is given in Table 10.1.

In males the median values were higher in adults than in children but a small decrease was noticeable in those over 64 years of age. Older women had higher median levels than younger women. The pregnant group, however, had the highest median value. These differences among the physiological groups corresponded closely with those observed in the serum cholesterol values (Table 5.5, Chapter 5), and in each province the median tocopherol levels were usually proportional to the median cholesterol levels. In general, the findings were similar in the two seasonal surveys and among the metropolitan, urban and rural population types.

Although an interpretive standard was not available for classifying the serum values according to the risk of deficiency, levels below 5 μg/ml are usually considered to indicate a deficiency. The tabulated results showed that a significant proportion of children and adolescent males had values below 6 μg/ml. The prominence of these relatively low values in the younger age groups compared with the adults was probably a reflection of low serum lipoprotein levels in children rather than an indication of an increased risk of nutritional disease. Few people in any age groups had values below 4 μg/ml.

10.3 INDIAN RESULTS

The same age and sex patterns were apparent for Indians as in the national survey with highest values occurring in females over 39 years of age and during pregnancy (Table 10.2). Median values, though, were generally lower than in the national sample and a relatively larger percentage of the

values fell between 4 and 6 μg/ml, especially in the younger age groups (less than 20 years). The levels of serum cholesterol were also lower in Indians than in the national population and there was a close parallelism between the vitamin E and cholesterol values.

10.4 SUMMARY

On the basis of currently accepted guidelines, no evidence of vitamin E deficiency was discernible in the results of the serum tocopherol determinations.

The findings were similar in all of the provinces but the levels tended to be lower in Indians and Eskimos than in the national sample. In the absence of clearly defined standards, only a tentative interpretation of the values can be attempted at the present time. Nevertheless, the results are presented in detail in the hope that the construction of a suitable standard for serum vitamin E will be facilitated. The findings agree with those obtained in previous surveys and they demonstrate, perhaps more forcibly than has been shown hitherto, that serum tocopherol levels are related to the age and sex of the individual and perhaps more directly to the serum lipoprotein levels.

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CHAPTER 11 – CALCIUM, PHOSPHORUS AND VITAMIN D

11.1 INTRODUCTION

Calcium and Phosphorus

Calcium and phosphorus are the major constituents of bones and teeth. The skeleton of the adult contains approximately 900 g calcium and 550 g phosphorus. These minerals also have many roles in the soft tissues, functioning in the blood clotting mechanism, muscle contraction and the transmission of nerve impulses. Calcium also affects cell permeability and is a constituent of many tissue substances including intercellular cement. Phosphates are key intermediates in numerous metabolic pathways and the element is a component in phosphoproteins, nucleoproteins and phospholipids.

Dairy products are the most important sources of calcium but some fruits and vegetables also provide significant amounts. Phosphorus occurs in many foods; dairy products, meat and fish are especially rich sources.

In the first eight years of life, it is necessary to retain at least 75 to 150 mg calcium daily for the growth of the skeleton. This need increases to 175 mg/day during the pre-pubertal and pubertal periods. The efficiency of utilization of calcium from foods is variable and substantial quantities of the element are lost each day in the feces, urine and sweat. The diet, therefore, must contain considerably more calcium than is actually retained by the bones and soft tissues. The absorption of dietary calcium depends on the nature of the food and the physiological state of the individual. The absorption is high, for example, when the diet includes certain vegetables, eggs or orange juice. Absorption also increases during pregnancy and when diets low in calcium are consumed for long periods. Because of these variations, there is controversy over the minimum amount of calcium which should be included in the diet (1).

Primary deficiencies of calcium and phosphorus have not been observed in man. The blood levels of these elements remain relatively constant because they are controlled by a delicate homeostatic mechanism that involves vitamin D, parathyroid hormones and a special thyroid hormone, calcitonin.

Vitamin D

The percursors of vitamin D are present in some foods and in human skin. Upon exposure to ultraviolet light these provitamins are changed to the active forms of vitamin D (cholecalciferol and ergocalciferol). Persons

who are regularly exposed to sunlight have little or no requirement for vitamin D in the diet. However, those shielded from sunlight, such as infants or the housebound, must obtain vitamin D from foods.

Food sources of vitamin D are limited, the most potent source being fish liver oils such as cod and halibut. Foods such as milk, eggs and meat contain lower concentrations of vitamin D, but if consumed in plentiful amounts may be significant sources of this nutrient. Under the Food and Drugs Act, milk and margarine may be fortified with vitamin D, but some processors do not add the vitamin to their products.

Vitamin D is particularly important during periods of growth and in Canada a dietary requirement of 400 I.U. daily has been set for children, adolescents and pregnant women.

Metabolites of vitamin D are key factors in the control of blood calcium by a mechanism which involves the parathyroid gland, the kidneys, the intestines and the bones (2).

In the absence of vitamin D, the calcification process in bone is disrupted and the deficiency disease known as rickets in children and osteomalacia in adults occurs. Characteristic lesions appear in the bones and joints and, in severe deficiency, the bones contain large amounts of incompletely calcified osteoid tissue. Osteoid is softer than properly formed bone and is unable to bear the mechanical stresses normally put upon the skeleton. The bones and joints are weak and consequently become deformed: affected children develop knock-knees and bow-legs and their breathing is laboured because of the loss of rigidity in the thoracic cage. There is also improper calcification of circumscribed areas of the skull (craniotabes) (3).

Three stages of vitamin D deficiency in infants have been characterized from biochemical measurements: in stage I there is hypocalcemia which is sometimes accompanied by convulsions; in stage II the serum calcium is normal but there is hyperaminoaciduria, hypophosphatemia, hypophosphaturia and usually overt signs of rickets; and in stage III there is severe rickets, hypophosphatemia and a recurrence of hypocalcemia (4). In active rickets, the level of the serum enzyme, alkaline phosphatase, is elevated (3).

Rickets was common among children living in industrial cities during the first three decades of this century. Park (5), in 1923, wrote: "One can say that rickets is so common in the large cities of America and Europe that few children among the poorer classes are untouched by it."

In Canada, rickets has caused far more deaths than any other vitamin deficiency. The annual number of deaths due to rickets fell dramatically in 1930-31 when irradiated ergosterol was first utilized and it has been

decreasing gradually since that time. However, in nationwide surveys conducted by the Department of National Health and Welfare between 1946 and 1951, evidence of healed rickets was found in 11.8 to 14.5% of the participants (6).

Reports of rickets in Canada continue to appear and the problem is especially evident in regions where the milk supply is not supplemented with vitamin D (7,8).

Large amounts of vitamin D are toxic but it is suspected that even small excesses over the dietary requirement can have a deleterious effect in sensitive individuals. Such excesses of vitamin D have been suspected to be the cause of idiopathic hypercalcemia and its tragic clinical manifestations (9).

11.2 NATIONAL RESULTS

Dietary Calcium

All groups, except pregnant women and teenage girls, had adequate median intakes of calcium (Table 11.1 and Figure 11-1). The median intake of teenage girls was in the marginal range. The standard for this group (650 to 1,150 mg/day) was obtained by interpolation of the two standards for teenagers (see Chapter 4). The median intake of pregnant women was also in the marginal range. It was, however, much higher than that of comparable non-pregnant women, 20 through 39 years of age (1,041 mg/day versus 587 mg/day) (Table 11.1).

Infants and young children consumed adequate amounts of calcium. The median intake of infants under 1 year of age was more than twice the adequate standard of 500 mg/day (Table 16.7). The 1 through 4 year olds had lower intakes than the infants but their median intake was still above the standard.

Teenage boys had the highest median intake of any age group and the elderly women had the lowest. In general, males had higher intakes than females. The median intakes in adult males (20-64 years) were far above the adequate level. The median intakes of children (5-9 years), elderly men and adult women were adequate but close to the marginal range which suggested that some individuals in these groups may not consume adequate amounts.

The intakes were not related to the time of year (summer-fall or winter-spring) or the population type (metropolitan, urban or rural).

Potential Dietary Vitamin D

The vitamin D values were calculated only from the consumption of milk, margarine and supplementary vitamins. It was assumed that all milk and margarine was fortified as permitted by the regulations of the Food and Drugs Act. As milk and margarine may be nonfortified, many of the intakes could be over-estimated.

In each group, the distribution of intakes was markedly skewed and the mean value (unpublished) was often one and a half to two times the median (Tables 16.7 and 11.3).

The distributions for all groups are presented, but the intakes of adults are not assessed because their dietary requirements are ill-defined.

Infants under 1 year of age had the highest median intake of vitamin D (Tables 16.7 and 11.3). Furthermore, this was the only physiological group having a median intake greater than the adequate standard of 400 I.U./day. The median intake of 1-4 year olds was much lower than that of infants, falling within the marginal range of 150 to 400 I.U./day (Table 16.7). The median intakes of older children, adolescents and pregnant women were also in the marginal range (Figure 11-2).

As shown in Table 16.7, 13.2% of the infants under 1 year of age had intakes over 1,000 I.U., presumably because they took supplements; a small percentage of children under 5 in the national sample had undesirably high intakes in the range of 2,000 to 16,000 I.U.

Pregnant women tended to have higher intakes of vitamin D than non-pregnant, 20-39 year-old women (317 I.U. versus 80 I.U. median intake). It appears that some had taken vitamin supplements because unusually high individual values were observed and 4.2% were in excess of 1,000 I.U.

No consistent effects of season or population type on the intakes of vitamin D were apparent.

Serum Calcium, Phosphorus and Alkaline Phosphatase

The distributions of serum calcium, phosphorus and alkaline phosphatase values are shown in Tables 11.5, 11.9 and 11.13. Risk classifications of serum calcium, serum phosphorus for children under 5 years of age and combined calcium and phosphorus are presented in Tables 11.7, 11.11 and 11.15.

The majority of the serum calcium values were between 9 and 11 mg/100 ml. Children below 5 years of age had the highest median value of any

group. Pregnant women had the lowest median and the highest percentage at risk (5%) as shown in Table 11.7.

A small proportion of individuals in most age groups, particularly the elderly women, had serum calcium levels greater than 11.5 mg/100 ml, which suggested hypercalcemia.

The serum phosphorus levels fell dramatically with increasing age and there was a wide range of phosphorus values in each group.

Of children under 5 years of age, 4.1% had low levels of serum phosphorus (Table 11.11) but few children (0.5%) had low serum calcium values (Table 11.7). Low calcium and low phosphorus values (Table 11.15) were not observed in the same individual and therefore no children were at high risk for the combined classification of serum calcium and phosphorus.

Serum alkaline phosphatase values fell gradually with increasing age in children and adolescents and dropped sharply at 20 years of age. Interpretive standards have yet to be developed for the assay procedure used but it is apparent that values far above the medians, which might indicate rickets or osteomalacia, were uncommon in the national sample (Table 11.13).

Clinical Evidence of Rickets

No unequivocal evidence of rickets was obtained in the clinical examination. Craniotabes, bowed legs and rachitic rosary were occasionally observed in infants or young children and the significance of these findings is discussed fully in Chapter 15.

11.3 INDIAN RESULTS

Dietary Calcium and Vitamin D

Intakes of calcium for every group were lower than in the national population as shown in Figure 11-1 and Table 11.2. The 10 through 19 year-old girls and the pregnant women had median intakes which were inadequate according to the standard. Children 5 through 9 years of age, all adult women and elderly men had intakes in the marginal range. Only children under 5 years of age and the men from 20 through 54 years of age had intakes above the levels of adequacy.

The distributions of the vitamin D intakes are given in Table 11.4. The median values (Figure 11-2) were consistently below those of the national

sample. Children under 5 years of age had intakes in the marginal range and older children, teenagers and pregnant women had intakes below the inadequate level. There was little evidence of the use of vitamin D supplements by children and pregnant women.

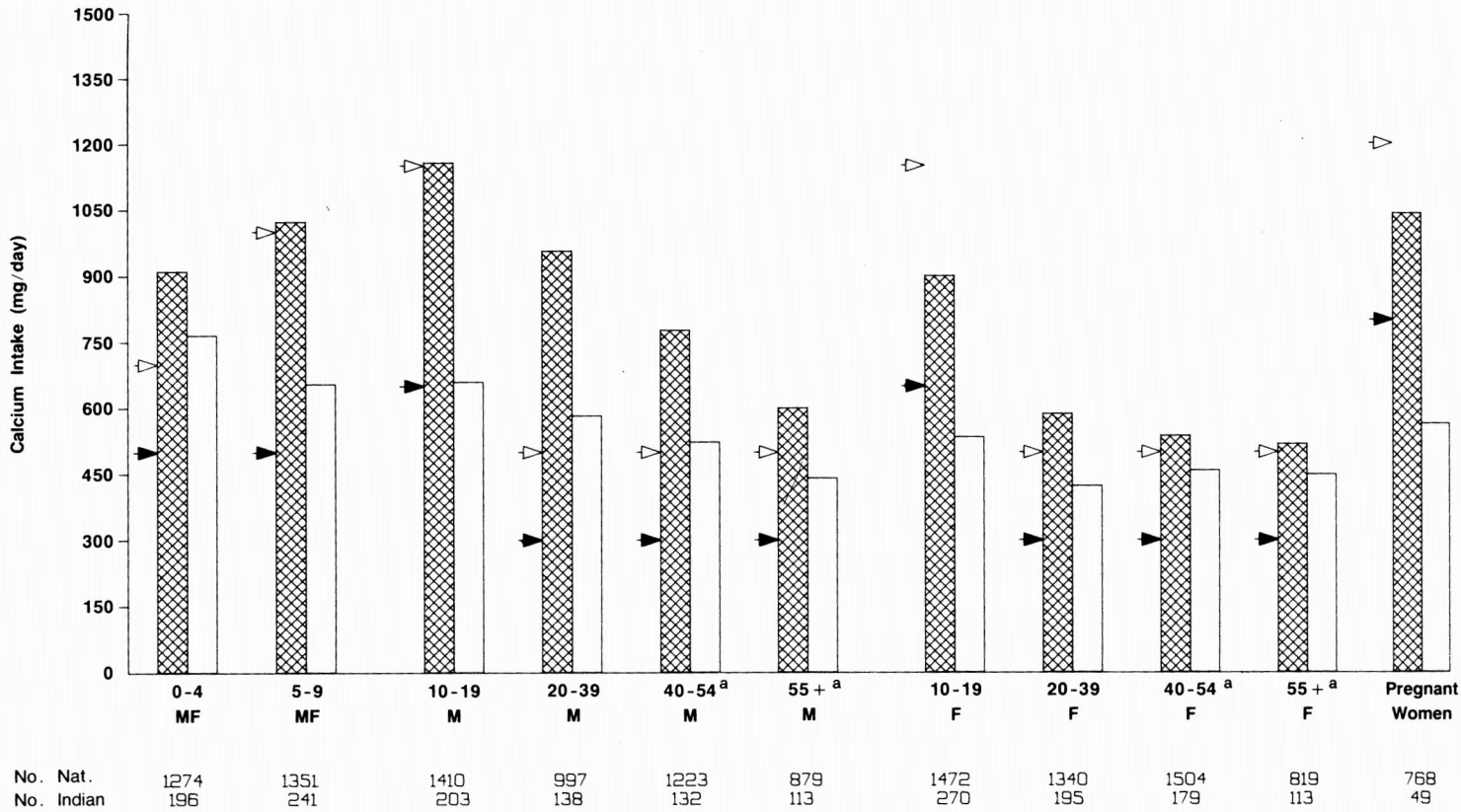
Serum Calcium, Phosphorus and Alkaline Phosphatase

The distributions of serum calcium, serum phosphorus and alkaline phosphatase are given in Tables 11.6, 11.10 and 11.14. The values for calcium and phosphorus are classified into risk categories in Tables 11.8, 11.12 and 11.16. The results were similar to those described for the national sample.

Figure 11-1

NATIONAL AND INDIAN SURVEYS

MEDIAN INTAKES OF CALCIUM



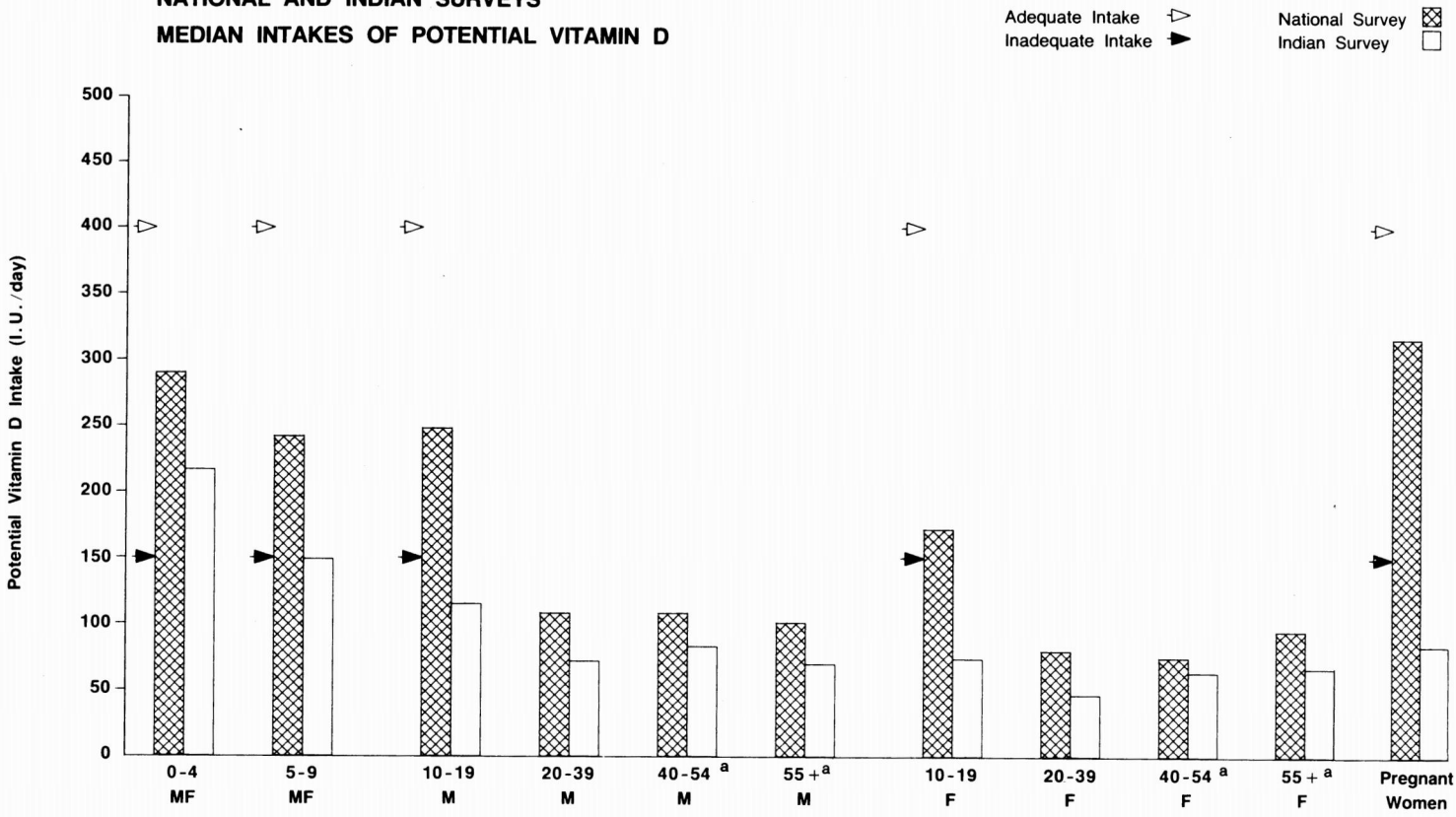
	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [a] M	55 + [a] M	10-19 F	20-39 F	40-54 [a] F	55 + [a] F	Pregnant Women
No. Nat.	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
No. Indian	196	241	203	138	132	113	270	195	179	113	49

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 11-2

NATIONAL AND INDIAN SURVEYS

MEDIAN INTAKES OF POTENTIAL VITAMIN D



[a]In National Survey (40-64 M&F, 65 + M&F).

11.4 SUMMARY

The calcium intakes of the provincial populations were generally satisfactory for most groups. The low intakes of teenage girls were the cause of greatest concern; the median values of this group usually fell into the marginal range. The median values of pregnant women, except in British Columbia, were also in the marginal range but the adequate standard for this group (1,200 mg) is unlikely to be surpassed regularly unless the consumption of calcium-rich foods such as milk and cheese is increased.

Regional and provincial variations were observed in the calcium intakes which probably are attributable to differences in milk consumption. The mandatory fortification of flour in Newfoundland had a noticeable effect on the calcium intakes, and the median values of some groups were the highest of any of the provinces. The Atlantic provinces in general tended to have higher median calcium intakes than other provinces. Quebec had some of the lowest.

The calcium intakes of Indians and Eskimos were lower than the provincial populations, and Indian and Eskimo teenage girls and pregnant women had unquestionably inadequate intakes.

The vitamin D intakes were satisfactory in the provinces for the most vulnerable age group (0-1 year of age), but exceptions existed. The median values fell progressively deeper into the marginal range with increasing age. This was not an unexpected finding and it does not necessarily reveal a potential nutritional problem; the dietary requirement of most older children is small because of exposure to sunlight. The intakes of many adults were low and they would be insufficient for individuals confined indoors for long periods. The groups of greatest concern in this respect were the elderly. Indians had lower vitamin D intakes than most other Canadians, indicating that they consumed less milk and margarine. In view of the low intakes of infants and pregnant women, it must be assumed that exposure to sunlight plays a major role in preventing rickets in Indian communities.

The vitamin D intakes of Eskimos were so low that unless significant dietary sources of vitamin D have been overlooked, Eskimo children must be perilously close to developing overt rickets. It is possible that the low vitamin D intakes, like those of vitamin A, are a recent development which stems from marked changes in dietary habits; if this is true, rickets will become common in Eskimo children if remedial action is not taken in the near future.

Although the dietary recalls indicated that vitamin D intakes were sometimes below the level of the interpretive standard, there was little clinical evidence of active or past rickets, even in Eskimos. However, the disease has been reported, at low prevalence, in hospitals in several parts of the country.

The serum calcium, phosphorus and alkaline phosphatase levels confirmed the clinical findings and provided no evidence of rickets. There was no increased prevalence of high risk calcium or phosphorus levels in groups, such as the Eskimos and Indians, who had relatively low intakes of calcium and vitamin D.

In conclusion, the diets of many girls and pregnant women should contain larger amounts of calcium and vitamin D. An improvement in the vitamin D intake of the elderly is also needed. Improvement could be achieved by the consumption of more dairy products but motivation for changes in dietary patterns can only begin through nutrition education programs. The deficits in the intakes of calcium and vitamin D in Indians and Eskimos, like other dietary deficiencies in these groups, will probably require more extensive remedial action.

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CHAPTER 12 – IRON

12.1 INTRODUCTION

Iron is an essential component of the oxygen-carrying pigments hemoglobin and myoglobin and the respiratory enzymes of the tissues. Most of the iron in the body is in the form of hemoglobin (65%) and the storage forms of ferritin and hemosiderin (25 to 30%). The remainder is in the form of myoglobin (3 to 5%) and in transferrin (approximately 1%), a beta globulin, which transports iron.

The principal dietary sources of iron are meat, cereals, eggs and green leafy vegetables. Many factors affect the efficiency of absorption. It is generally accepted that heme iron in meat, fish and poultry is absorbed more efficiently than iron in vegetable foods. The importance of meat in the diet has been underlined recently in experiments which have shown that meat improves the absorption of added iron (i.e., iron for enrichment purposes) and iron from vegetable sources (1). Eggs reduce iron absorption of non-heme iron in other foods but ascorbic acid has the opposite effect (2,3,4). In Canada a significant amount of dietary iron is derived from foods fortified with iron. Concern has been expressed that some sources of iron currently used for fortification purposes are not efficiently absorbed (5). It is also known that iron absorption increases as iron stores decrease, and possibly as iron need increases, such as during pregnancy (6).

The iron intake needed to maintain stores and hematological parameters at normal levels is determined by age, sex and physiological state. Iron requirements are increased during periods of rapid growth, in association with increase in blood volume, such as during infancy, adolescence and pregnancy. Otherwise in the adult it is only necessary to replace iron losses which, in the male, amount to about 0.9 mg/day (7). In the female, additional iron is required to replace menstrual losses. The magnitude of iron stores prior to pregnancy is important in determining ability to cope with the extra demands of pregnancy. Several studies have shown that maternal stores and dietary intake are often insufficient to cope with this demand (8,9,10), although a moderate fall in hemoglobin during pregnancy is a normal physiological adaptation (11).

Infants derive their iron stores from the mother and are likely to be at risk of iron deficiency if born prematurely (12). It is generally accepted that breast feeding is adequate for the normal full-term infant since there is little change in total body iron during the first four months of life. After this time it is necessary to provide additional iron for tissue deposition as well as for increases in blood volume (13). This is usually accomplished by the introduction of a variety of foods to the infant's diet.

A deficient iron intake causes anemia, a condition in which the hemoglobin content of the blood is lower than normal. Nutritional anemias can also result from deficiencies of nutrients such as vitamin B_{12} and folic acid. Iron deficiency anemia can be distinguished from these other disorders by measuring hemoglobin levels in conjunction with other estimates of iron status. However, combined forms of nutritional anemia may also occur. The development of iron deficiency can be divided into three stages which often overlap. In the first stage, iron is mobilized from the storage forms in liver and bone marrow. Under these conditions, iron absorption from the gut increases. When mobilized storage iron and enhanced absorption are inadequate to meet the needs of developing red blood cells in the bone marrow, serum iron levels fall, the amount of transferrin usually increases, and the percentage saturation of transferrin falls. When transferrin saturation falls below a critical level, the cells of the bone marrow cannot obtain sufficient iron to develop normally. In the final stage, hemoglobin levels fall and other changes occur, such as a decrease in cell size and number (hematocrit changes) and decrease in hemoglobin concentration in cells (mean corpuscular hemoglobin).

Clinical signs and symptoms most commonly attributed to iron deficiency are anorexia, depressed growth and decreased resistance to infection in children. Fatigue, breathlessness and palpitations upon exertion are frequently cited as symptoms of mild-to-moderate iron deficiency in adults. Recent studies have also demonstrated a significant reduction in work capacity in subjects with iron deficiency anemia (14). Other clinical signs may also be seen in iron deficiency. The tissues most commonly affected are the nails (spoon-shaped depressions) and the tongue (soreness; smooth and red papillae). Deficient acid secretion in the stomach is also common.

There is disagreement concerning the level of hemoglobin which is diagnostic of anemia. Nevertheless, it is accepted that nutritional anemias are a major nutritional problem in developing countries (15), Europe (16) and the U.S.A. (17,18). Prior statistics on the prevalence of iron deficiency anemia in Canada are limited, although a large-scale survey of hemoglobin values has recently been conducted (19). In this survey a total of 21,580 values were analyzed statistically by age and sex. When the cut-off points for hemoglobin were 14 g/100 ml (male) and 12 g/100 ml (female), approximately 40% of middle-aged men, 60 to 70% of elderly men and 20% of the women were classified as anemic. In a screening of 252 infants attending health centres in Toronto, it was found that 29% had hemoglobin values below 10 g/100 ml (20), a level which is certainly demonstrative of anemia.

Hemoglobin values considered to be low have also been found in earlier Canadian studies conducted in Nova Scotia (21), in school children in British Columbia, Saskatchewan (22) and New Brunswick (23), in children under 6 years of age in isolated Indian communities (24,25) and in housebound elderly people (26). Eskimos living in a typical aboriginal hunting society had

normal hemoglobin values. However, Eskimos relocated to an industrial setting had hemoglobin values which were significantly below normal in all of the age and sex groups except infants and adult males (27).

12.2 NATIONAL RESULTS

The distributions of the intakes of iron are listed in Table 12.1, and for children under 1 year and 1 through 4 years of age in Table 16.8. In all groups there was a wide variation in the daily intakes although in general the majority of the values were below 20 mg. Most of the exceptionally high intakes were probably achieved by the use of dietary supplements.

The median daily intake (see Figure 12-1) of the 0-4 year-old children (8.8 mg) exceeded the adequate standard by only 0.8 mg. A substantial percentage of the intakes (23.3%) was in the inadequate range. These findings, even when day-to-day variations in intake are considered, suggest that a substantial number of children below 5 years of age did not obtain adequate amounts of iron in their diets. At the other extreme, 13.3% of the children 0-4 years had intakes above 20 mg indicating a relatively frequent use of iron supplements. The majority of the infants with high intakes were below 1 year of age (Table 16.8).

The intakes of children 5-9 years old were slightly better than those of the younger children and their median intake of 10.5 mg was above the adequate standard.

The median intake of teenage males (15 mg) was at the adequate level, but the median intake of teenage girls (10.8 mg) was marginal and close to inadequacy.

Men had iron intakes that were well in excess of their standards. Adult women had median intakes (11.1 mg and 10.8 mg) that were marginal and very close to the inadequate range.

Among pregnant women, 52.6% of the intakes were below 20 mg but 37% were above 40 mg (Table 12.1), the latter certainly reflecting the use of dietary supplements. Even with these high intakes the median intake of the group was in the marginal range and many of the intakes (29.7%) were below the inadequate standard.

Distributions are listed for hemoglobin (Table 12.3), mean corpuscular hemoglobin concentration (Table 12.7) and hematocrit (Table 12.15). Tabulations of the values according to the risk categories are given for hemoglobin (Table 12.5 and Figure 12-2) and MCHC (Table 12.9 and Figure 12-3). For children under 1 year of age and children 1-4, distributions for

hemoglobin are listed in Table 16.8 and for MCHC and hematocrit in Table 16.9. Risk classifications are given for hemoglobin and MCHC in Table 16.10.

An increase in median hemoglobin values with age was apparent in children and teenagers. In adult men, the median values tended to be lower in the older groups than in the younger groups. The values for males were higher than those for females and substantially lower values occurred in the pregnant group.

There was a low prevalence of frank anemia (high risk) in all of the age groups and the highest prevalence (2.4%) was in the 65 year-old and over males. The small decline in median values in adult men was reflected in an increasing prevalence of values classified at moderate risk.

Differences were sometimes observed in the median hemoglobin values and in the percentages classified at risk during winter-spring and summer-fall. The highest median values were not observed in the same season in all of the provinces. Such differences may have arisen from small variations in the hemoglobin standards used in the field laboratory.

No marked differences appeared among age or sex groups in median values of MCHC although the values for men between 20 and 65 years of age were slightly higher than those of the other groups. This difference was reflected in the percentages classified at moderate risk (Table 12.9). Small percentages were classified at high risk in the children below 4 years of age, in men over 64 years of age and in all of the female groups. No consistent effects of season were noticeable.

The distributions of the hematocrit values are shown in Table 12.15. The changes with age and sex were similar to those in the hemoglobin values.

The distribution of serum transferrin saturation values are listed in Table 12.11, risk classifications in Table 12.13 and Figure 12-4 and the distributions of serum iron values in Table 12.17.

The median transferrin saturation values were higher in boys and men than in the other groups. The percentages classified at high and moderate risk were highest in children below 10 years of age and in all females under 65 years of age. Among males, those over 64 years of age had the highest percentage at risk, especially in the metropolitan areas, but a small percentage (less than 4%) of males in other age groups were at high risk.

Serum iron values were noticeably higher in pregnant women than in the other physiological groups; this difference was probably attributable to

the use of supplements. Data for infants below 1 year are not presented since the sample size was too small because of the difficulty in obtaining venous blood samples.

12.3 INDIAN RESULTS

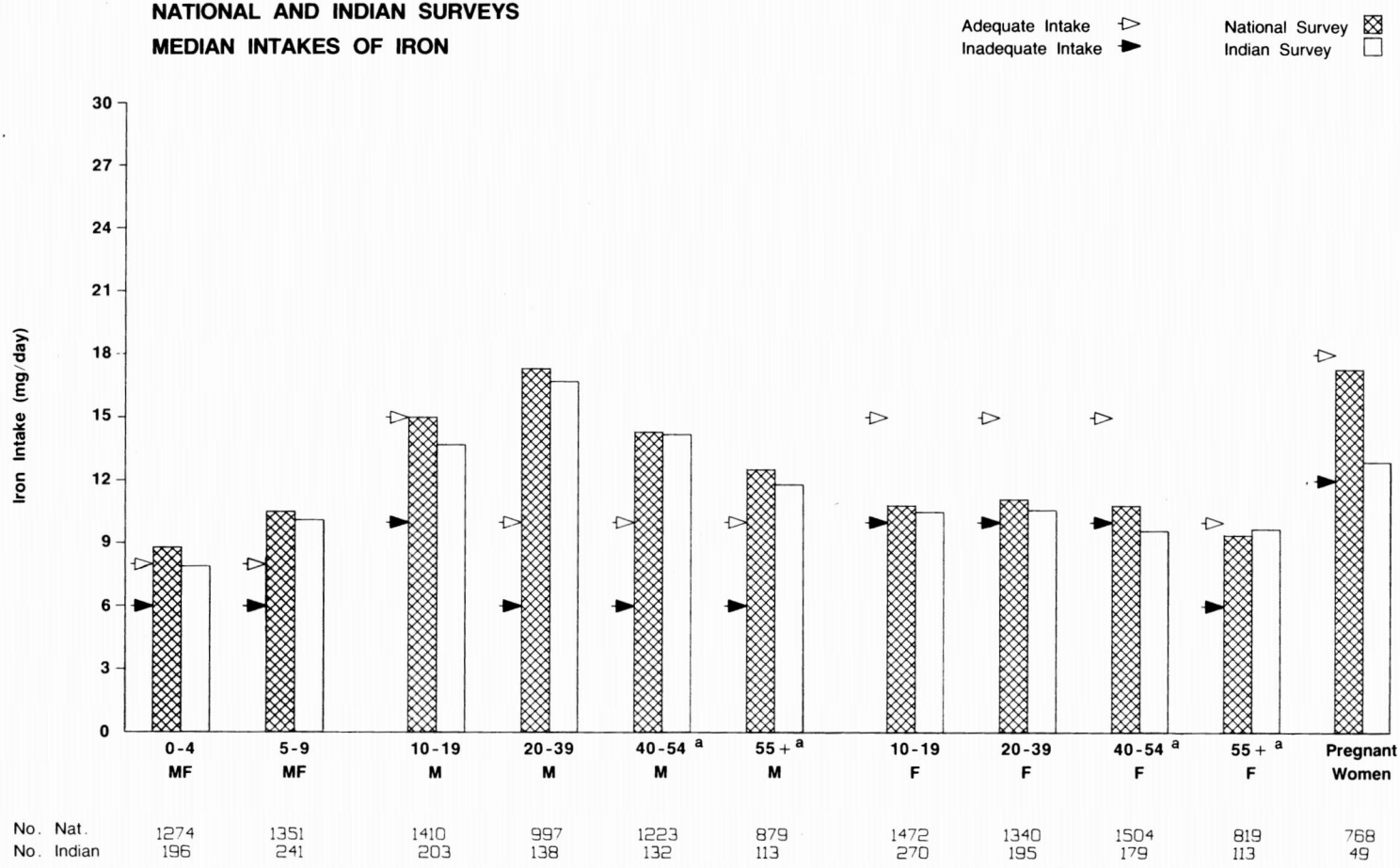
The results for the Indian survey are presented in Figure 12-1 and Table 12.2 (dietary iron), Figure 12-2 and Tables 12.4 and 12.6 (hemoglobin), Figure 12-3 and Tables 12.8 and 12.10 (MCHC), Figure 12-4 and Tables 12.12 and 12.14 (serum transferrin saturation), Table 12.16 (hematocrit), and Table 12.18 (serum iron).

The median dietary intakes of Indians followed a similar trend to that described for the national sample. In the biochemical tests, low hemoglobin levels were commoner among Indians, particularly teenage boys and women, than in the national sample. The state of iron reserves as indicated by serum transferrin values in all groups was much poorer than that observed in the national sample.

Figure 12-1

NATIONAL AND INDIAN SURVEYS

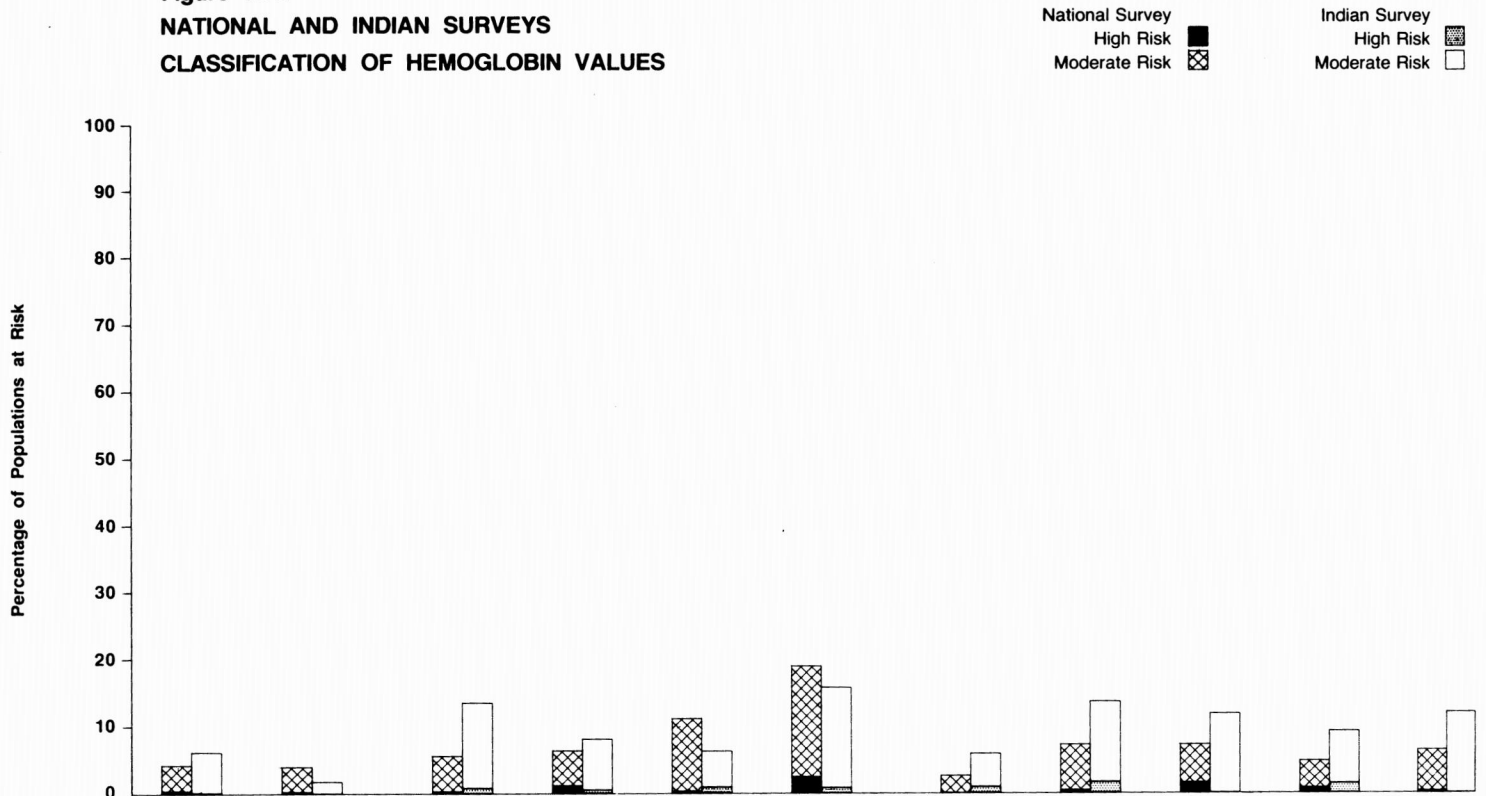
MEDIAN INTAKES OF IRON



	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M[a]	55 + M[a]	10-19 F	20-39 F	40-54 F[a]	55 + F[a]	Pregnant Women
No. Nat.	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
No. Indian	196	241	203	138	132	113	270	195	179	113	49

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 12-2
NATIONAL AND INDIAN SURVEYS
CLASSIFICATION OF HEMOGLOBIN VALUES



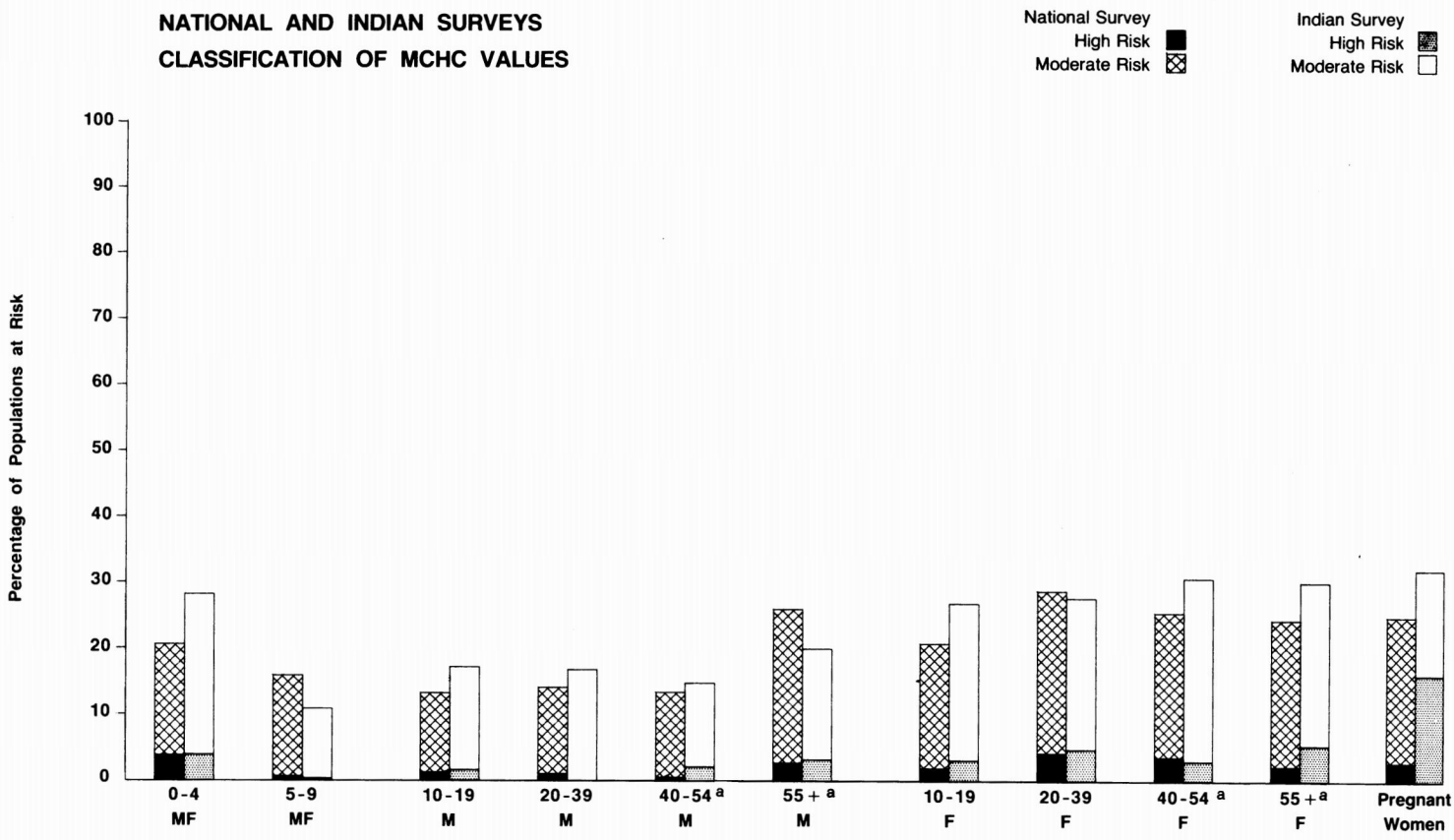
	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [a] M	55 + [a] M	10-19 F	20-39 F	40-54 [a] F	55 + [a] F	Pregnant Women
No. Nat.	1249	1358	1432	1016	1230	895	1498	1358	1519	834	767
No. Indian	193	235	196	134	128	114	260	191	173	114	50

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 12-3

NATIONAL AND INDIAN SURVEYS

CLASSIFICATION OF MCHC VALUES



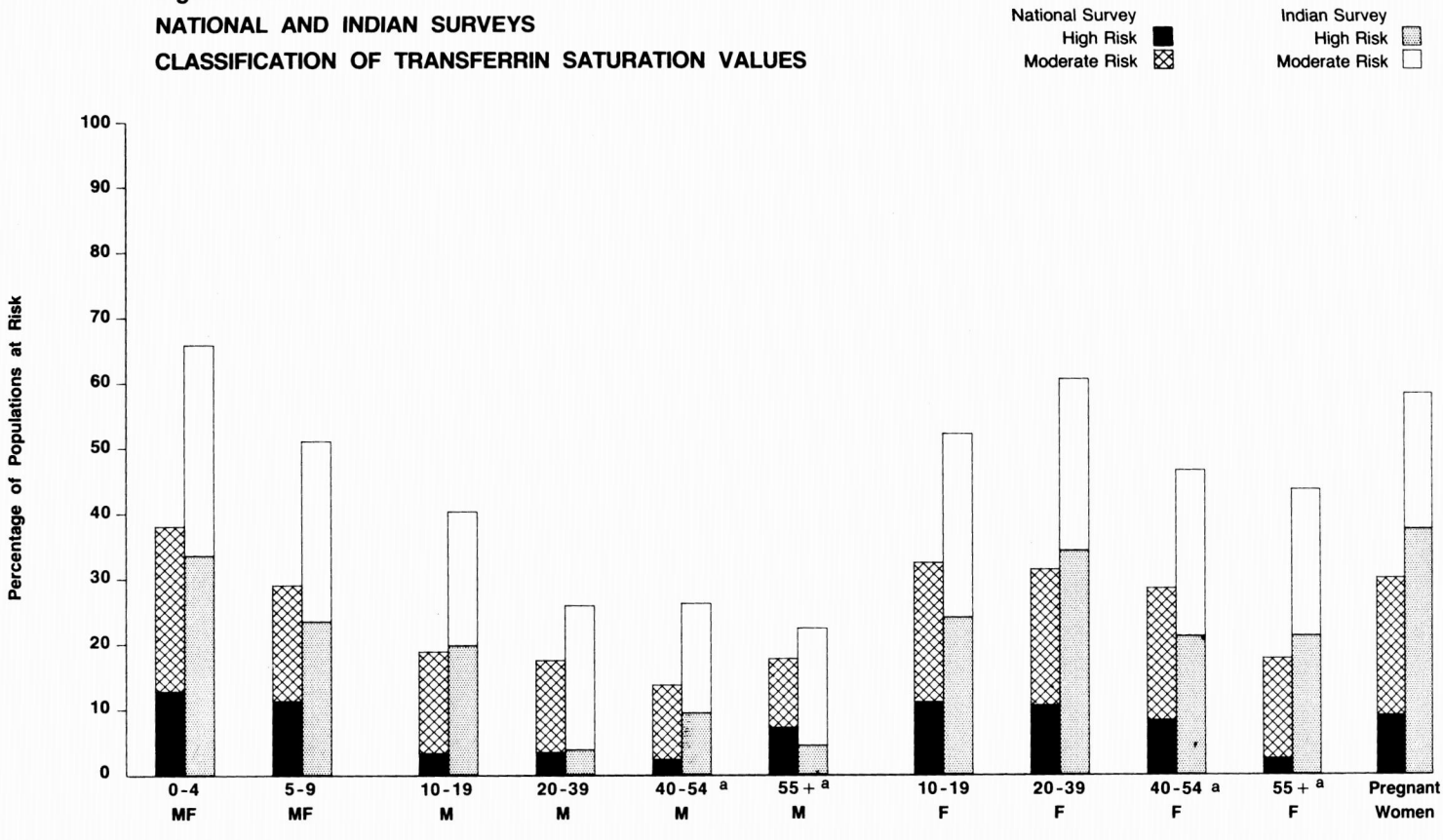
	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [a] M	55 + [a] M	10-19 F	20-39 F	40-54 [a] F	55 + [a] F	Pregnant Women
No. Nat.	1215	1337	1400	995	1209	875	1461	1333	1487	816	748
No. Indian	190	228	188	129	127	111	250	188	168	112	50

[a]In National Survey (40-64 M&F, 65 + M&F).

Figure 12-4

NATIONAL AND INDIAN SURVEYS

CLASSIFICATION OF TRANSFERRIN SATURATION VALUES



	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 a M	55 + a M	10-19 F	20-39 F	40-54 a F	55 + a F	Pregnant Women
No. Nat.	535	1228	1394	1008	1209	898	1475	1332	1490	810	733
No. Indian	109	226	197	135	131	115	252	192	175	111	48

[a]In National Survey (40-64 M&F, 65 + M&F).

12.4 SUMMARY

The dietary data in the national and Indian samples indicated that adolescents and women had median intakes in the marginal range and infants and children had barely adequate median intakes of iron, whereas only men had median intakes well in excess of the standard of adequacy. There was a wide variation in values showing considerable daily differences in the amount of iron consumed. The results also indicated that a substantial number of infants and pregnant women and a few individuals in other groups had high iron intakes because of the use of dietary supplements.

The dietary data for Eskimos, in contrast, showed that the median intakes of iron for most groups were higher than in the national population, although some groups such as adolescent girls still had intakes in the marginal range.

The transferrin saturation values indicated that the iron reserves were inadequate in a substantial proportion of the population. The prevalence of this deficiency was higher in women, children and adolescents of both sexes than in other groups; however it was also frequently observed among men. Much greater proportions of Indians and Eskimos, as compared with the national sample, were classified at high or moderate risk.

Severely reduced levels of hemoglobin were found in only a small percentage of the national, Indian and Eskimo populations. A substantial proportion in all the population groups had values at moderate risk, indicative of failure to reach optimal levels, with middle-aged and elderly men more at risk than women. Since this difference between the sexes was not evident in the transferrin saturation levels, the hemoglobin standard for males is perhaps too high, or the anemia may be due in part to other causes, such as folate deficiency.

The MCHC values were less satisfactory in infants, females and elderly men than other groups. The proportions at risk among Eskimos and Indians based on hemoglobin and MCHC values were generally much greater than those observed in the national sample.

The unsatisfactory iron status of Eskimos revealed by the biochemical data is not concurrent with dietary findings. Some groups with poor iron reserves and mild anemia had median dietary iron intakes which were well in excess of adequacy and were higher than observed in corresponding groups in the national sample. It is possible that the bioavailability of iron in the Eskimos' diet is adversely affected by other nutrient deficiencies or imbalances, such as folacin and ascorbic acid deficiency, and these may be partly responsible for the poor iron status and anemia observed in Eskimos. However, individual correlations may show a more definitive relationship between low

iron intakes and low transferrin saturation values, which is not revealed in analyses of group data.

The evidence of widespread iron deficits throughout the country is sufficiently strong to conclude that procedures to reduce the deficiencies, such as improved enrichment practices and nutrition education programs, should be considered.

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CHAPTER 13 – FOLACIN

13.1 INTRODUCTION

Folacin is the name applied to a group of vitamins that are converted in the tissues to coenzymes known as tetrahydrofolic acids. The coenzymes have important roles in the biosynthesis of the purine and pyrimidine units of nucleic acids which control protein synthesis and therefore cellular growth. The coenzymes also participate in many other biochemical processes including the metabolism of amino acids such as tryptophan, tyrosine and histidine.

Folacin occurs in most natural foods of animal and plant origin, particularly in glandular meats, leafy vegetables and yeast. In its natural state in foods, folacin exists in the free form but occurs predominently as folic acid conjugates, e.g., polyglutamates (PGA). Because of the paucity of data available on the folacin content of foods, it was not possible in the Nutrition Canada survey to estimate folacin intake.

Before absorption, naturally occurring conjugates of folacin must be reduced at least to the tri-, di-, and preferably to the monoglutamate form by intestinal and bile conjugases (1,2). There is uncertainty about the availability for absorption of the various forms of folacin in foods. Conjugase activity may be limited by inhibitors in certain foods (3) and by improper pH. (4). Furthermore, many forms of folacin can be easily destroyed by storing and cooking. The vitamin is stored mainly in the liver and total body stores are thought to be between 5 and 12 mg in an adult man (5). When the diet is severely deficient in folacin, clinical signs appear within four to six months (6). Deficiency may also be aggravated by other factors such as an excessive demand by body tissues during certain periods such as pregnancy and impaired absorption. Impaired absorption of folacin may be a contributing factor in the occurrence of anemia in alcoholics (7). Oral contraceptives have also been implicated in folic acid deficiency but the nature of their effect on folate metabolism is not yet understood (8). The minimum folacin requirements have not yet been definitely determined. However, it has been demonstrated that intakes of 0.05 mg of folic acid (PGA) maintained normal blood folate levels in a group of normal adult women, whereas intakes of 0.025 mg did not (9).

Folic acid deficiency interferes with red blood cell formation. Megaloblastic changes in the bone marrow are accompanied by the production of abnormally large, primitive red blood cells. The blood contains large red blood cells which in severe deficiency have a reduced hemoglobin content (macrocytic anemia). In developed countries such anemia has been observed in premature infants, pregnant women and the elderly (10). In a study of

pregnant women at an out-patient clinic in Montreal it was found that 1 in 4 had mild megaloblastic anemia (11). Folacin deficiency during pregnancy has also been associated with toxemia, prematurity and possibly fetal abnormalities (12). Other clinical signs of folacin deficiency include anorexia, weakness and glossitis (sore tongue).

Biochemical indices of folic acid status include measurements of the levels in red blood cells or serum. The level in red blood cells is an estimate of tissue stores while serum levels reflect the amount of folate in transport. The incidence of folacin deficiency may therefore be overestimated on the basis of serum levels. Serum levels fall within a few weeks when the diet is deficient in folacin, whereas bone marrow changes do not occur for some months (5). However, low serum folate levels indicate a higher risk of folate deficiency. In a study in England, the mean serum folate of women in the first trimester of pregnancy who subsequently became megaloblastic was 2 ηg/ml, whereas it was 5.4 ηg/ml in a group who remained normoblastic (13). In Montreal, mild megaloblastic anemia was observed in 30% of the pregnant women with serum folate values less than 4 ηg/ml and 40% of those with levels less than 3 ηg/ml (11).

13.2 NATIONAL RESULTS

The serum values for males and females were similar, as shown in the distribution Table 13.1. The levels in children tended to be higher than those in adults but a consistent change in different age groups was not obvious. Relatively high values (over 15.5 ηg/ml) were observed in more than a third of the pregnant women probably because they took supplements. In other physiological groups, 95% of the values were below 15 ηg/ml.

As shown in Table 13.3 and Figure 13.1, 10 to 20% of teenagers and adults were in the high risk category (serum values less than 2.5 ηg/ml) and approximately half of the population was classified at moderate risk (with serum values less than 5 ηg/ml).

The greatest prevalences of high risk values were among women 20-39 years of age (20.9%) and men over 64 years of age (17.2%). The results implied that the folate status of children was slightly better than that of adults.

The results were similar during both seasons and among metropolitan, urban and rural population types.

Abnormally smooth or red tongues among older individuals were the only clinical signs observed which could possibly be related to folacin deficiency (see Chapter 15 for further discussion).

13.3 INDIAN RESULTS

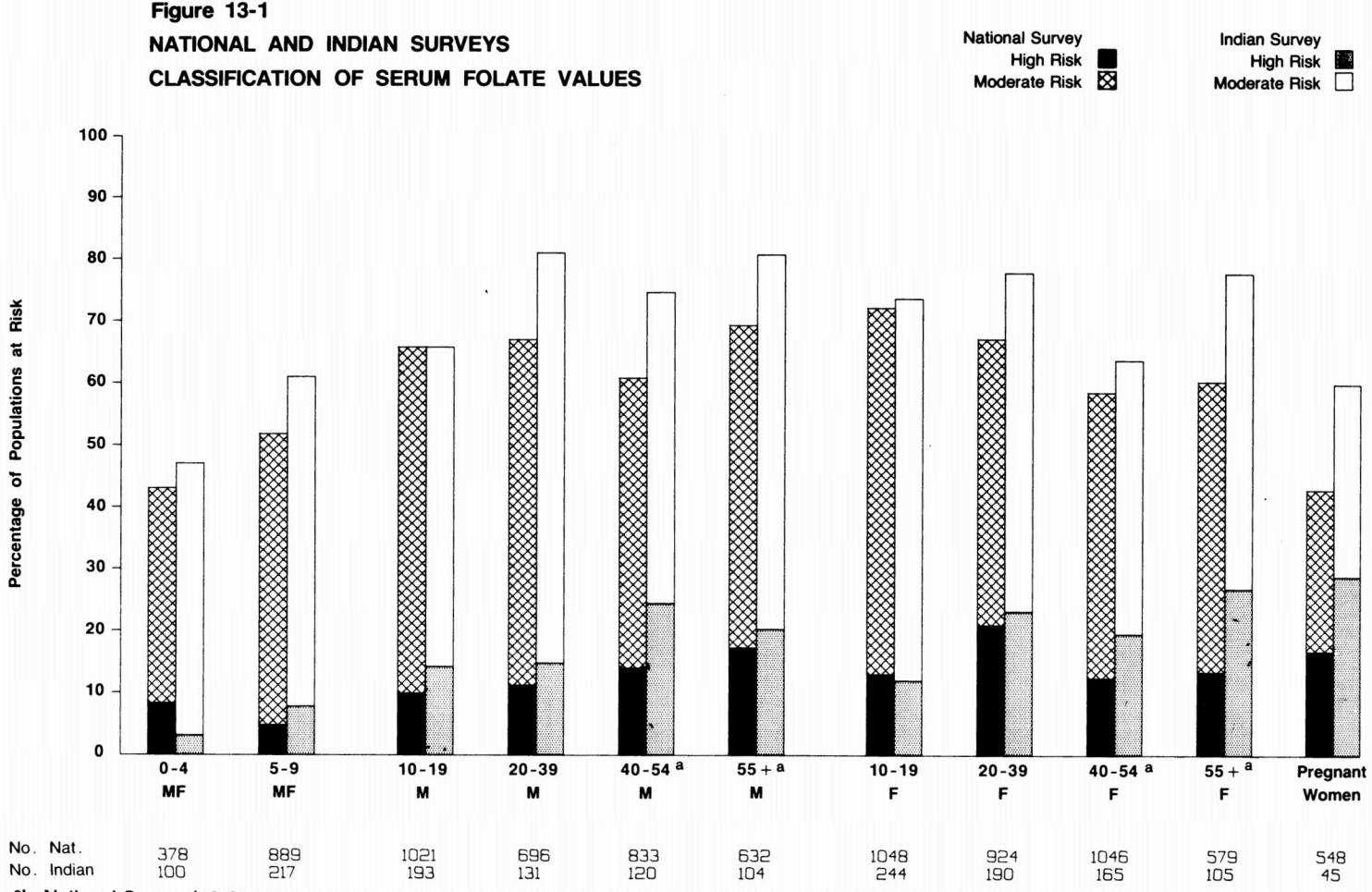
The distributions of the serum folate values for the Indian population are given in Table 13.2. The percentages classified at risk are shown in Table 13.4 and are displayed with the national data in Figure 13-1.

The percentage of Indians classified at both high and moderate risk was generally greater than in the national sample. Indians in remote centres generally had larger proportions at high risk than Indians close to urban centres.

Figure 13-1

NATIONAL AND INDIAN SURVEYS

CLASSIFICATION OF SERUM FOLATE VALUES



	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 a M	55 + a M	10-19 F	20-39 F	40-54 a F	55 + a F	Pregnant Women
No. Nat.	378	889	1021	696	833	632	1048	924	1046	579	548
No. Indian	100	217	193	131	120	104	244	190	165	105	45

[a]In National Survey (40-64 M&F, 65 + M&F).

13.4 SUMMARY

According to the interpretive standard, a majority of the participants in the survey had serum folate values which were classified at high or moderate risk. Serum folate levels reflect transient changes in dietary intakes and, consequently, low values do not necessarily indicate a protracted deficiency. In the absence of additional tests for folacin deficiency, such as examinations of peripheral blood and bone marrow cells for changes in cell morphology, it is impossible to estimate the actual prevalence of deficiency disease from the frequency of the low serum folate values. A tentative conclusion, however, would be that folate stores were low in most of the individuals classified at high risk. Thus, 50 to 80% of adult Eskimos and 10 to 20% of adults in other segments of the population probably had poor reserves. Low stores were evidently commoner among adults generally and among Eskimos and Indians, especially those remote from urban centres, than in other groups.

The greater prevalence of high risk serum folate values in Eskimos is probably attributable to the Eskimos' relatively low consumption of vegetables, dairy products and cereals. Meat, which makes up a large part of the Eskimos' diet, contains only modest amounts of folacin.

Clearly, further work is needed to define human requirements for folacin and to investigate fully the clinical significance of low serum folate levels and the effects of deficient intakes of folacin on health. Further analysis of combined clinical and biochemical survey results and dietary intake data may shed some light on possible relationships between these two sets of data. Meanwhile, all Canadians should be encouraged to consume larger quantities of those sometimes neglected foods, such as liver, cheese, bread, vegetables, oranges and nuts, that are good sources of the vitamin (14). Additional measures, involving socio-economic changes and improvements in the supply and distribution of foods, are obviously necessary in Indian and Eskimo communities.

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CHAPTER 14 – IODINE AND GOITRE

14.1 INTRODUCTION

Iodine is a component of the hormones thyroxine and triiodothyronine, which are synthesized by the thyroid gland. These hormones affect growth, metabolism and development. The activity of the thyroid gland is regulated by the anterior pituitary gland which secretes a thyroid-stimulating hormone in response to changes in the levels of the thyroid hormones in blood. When the diet is deficient in iodine, there is a compensatory stimulation of the thyroid gland. The resulting enlargement of the gland is known as goitre (1).

Iodine is obtained in the diet from sources such as dairy products, eggs, meat, cereals, and vegetables. The iodine content of these foods is variable but it is typically in the range 0.02 to 0.1 μg/g. Shell and marine fish are exceptionally rich sources and contain up to 3 μg/g (2). An additional source of iodine in Canada is household salt, which must be iodized to a level of 76 μg/g according to federal regulations. Certain foods, including bread, may supply iodine because of the use of iodate as dough conditioners. Iodine can also be derived from colouring and cleansing agents used in food processing (2). Because of the variation of iodine content in food and water and the difficulty of assessing salt intake, it was not possible in the Nutrition Canada survey to measure the iodine intakes of Canadians.

The daily urinary excretion of iodine can be used as an index of the dietary intake because most of the absorbed iodine is either utilized by the thyroid gland or excreted in urine. The urinary excretion is therefore low when most of the iodine in the diet is utilized by the thyroid gland and it is high when the requirements of the gland are greatly exceeded.

The urinary iodine excretion of each participant in Nutrition Canada was assessed from the iodine to creatinine ratio in a single sample of urine. A urinary excretion of iodine of less than 50 μg/g creatinine may be considered an indication of inadequate iodine intake in any group (4). The amount of creatinine excreted each day is proportional to the muscle mass and therefore the factors in the calculation of the daily excretion of iodine depend upon age and sex (3).

Although iodine deficiency has an important role in endemic goitre, other dietary factors may be involved. There are a number of substances (goitrogens) that induce goitre by blocking the uptake of iodine by the thyroid gland or by inhibiting the biosynthesis of thyroid hormones. Some of these goitrogens are present in animal feeds and human foods such as kale, cabbage, cauliflower, turnips, rape, mustard and soy. Sufficient extra iodine will counteract goitrogens that interfere with the iodine uptake of the thyroid gland but not

those that directly inhibit the formation of the thyroid hormones (1). In addition, iodine itself, if consumed in large amounts over prolonged periods, can result in thyroid enlargement – so-called "iodide goitre" (5). There is also a tendency for the normal and goitrous thyroid to enlarge during pregnancy (1).

In this survey, three sizes of goitre were recorded according to WHO classifications: Grade I – palpable goitres that are more than four to five times enlarged but not visible unless the head is thrown back and the neck extended; Grade II – goitres that are visible when the head is in a normal position; and Grade III – goitres that are large and prominent (1).

A number of surveys of the prevalence of goitre in Canada were conducted before World War II. Goitre was apparently common in rural areas of Quebec at the turn of the century. At that time, the goitres varied from small enlargements of the gland to huge pendulous growths (6). Reports in the 1920's stated that the disease was prevalent and sometimes a serious problem in mountainous regions and valleys of British Columbia (7). It was also frequently observed in parts of Saskatchewan, Alberta, Manitoba and Ontario. The condition was uncommon among Indians living in goitrous areas probably because of the high consumption of salmon (7). The low prevalence of goitre in Newfoundland was also attributed to the ingestion of seafood (1,8).

In other studies the relationship between goitre and the dietary intake of iodine has been less obvious. For example, in Alberta, the prevalence of goitre did not correlate with the iodine content of the water supply (9). Furthermore, in Winnipeg (10) and Saskatoon (11), racial origin seemed to be the single most important factor in the etiology of goitre and the consumption of large amounts of cabbage by some groups was suggested to be partially responsible for these ethnic differences (12).

Early in this century, goitre was prevented by iodine supplements administered on a trial and error basis (7). Later, iodized salt was marketed as an alternative to regular table salt and it was already widely used in Canada when the addition of iodine to all household salt was made mandatory in 1949.

14.2 NATIONAL RESULTS

Few individuals were classified at risk on the basis of urinary iodine levels, i.e., excreted less than 50 μg iodine/g creatinine (Table 14.3). The highest excretions of iodine occurred in infants and children (Table 14.1). Slightly lower values were found in men 20-39 years and in men over 64 years than in other groups. Among teenagers and adults, high excretions (1,000 to 10,000 μg/g creatinine) were found in up to 2% of each physiological group.

As shown in Table 14.5 and Figure 14-1, Grade I goitre was relatively common in both males and females; the highest prevalence (17.8%) was among pregnant women. Grade II and Grade III goitres occurred in a small percentage of females but they were rarely seen in males.

14.3 INDIAN RESULTS

Urinary excretions of iodine are tabulated in Table 14.2 and the percentages of the values classified at high or moderate risk are given in Table 14.4.

The distributions of the iodine excretions were similar to those observed in the national sample.

Details of the prevalence of goitre in Indians are given in Table 14.5 and illustrated with the national data in Figure 14-1.

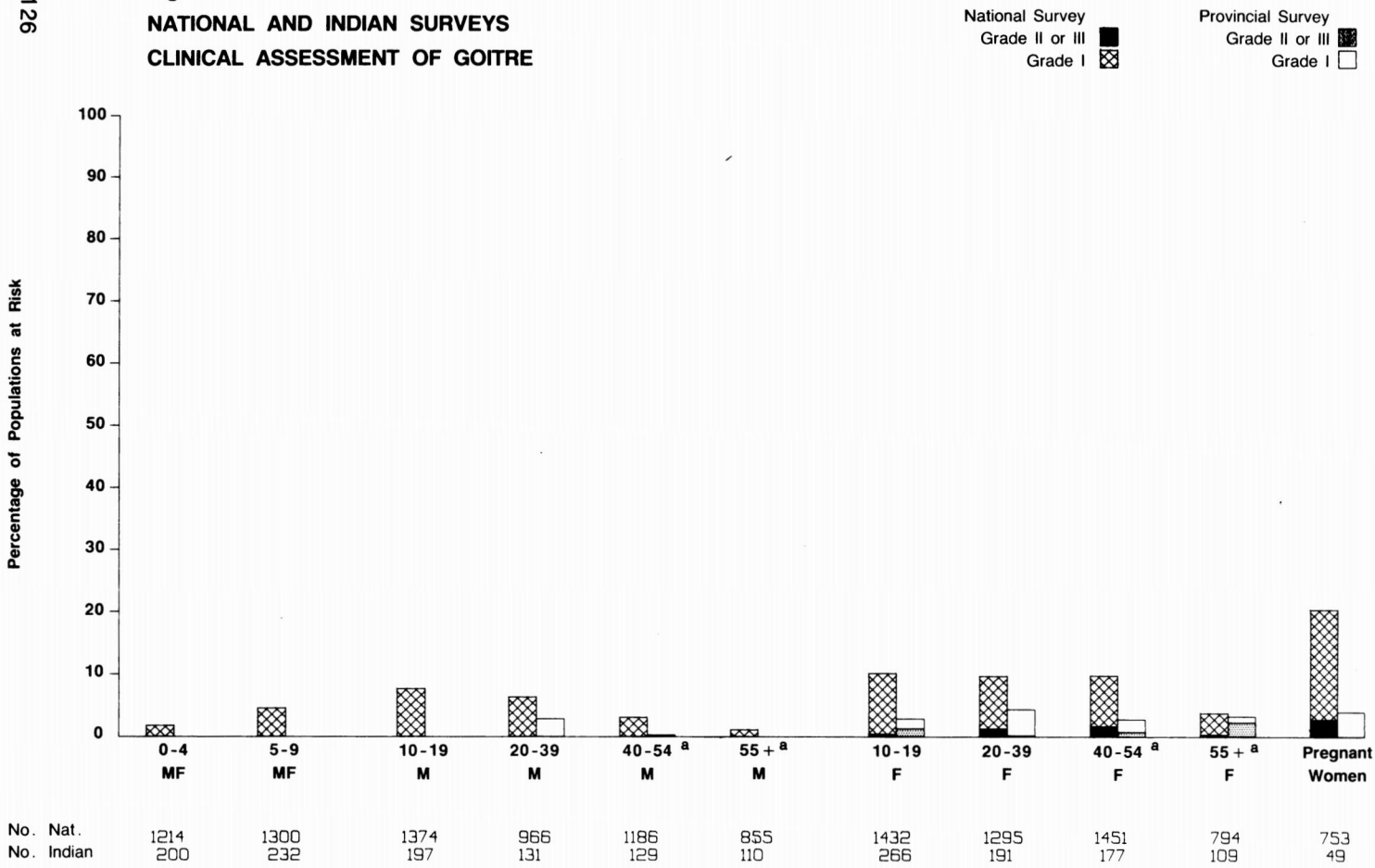
Grade I goitre was observed in a small percentage of adult men and in all groups of females. Grade II and Grade III goitres were recorded at low prevalence in children 5-9 years of age and in all groups of females except pregnant women.

In a more detailed examination of the data, individuals were classified into four categories on the basis of iodine excretion. The prevalence of goitre in these sub-groups is tabulated for the Indians (Table 14.6) and, for comparison, the prairie region (Table 14.7). A relationship between goitre and iodine excretion was not detected, i.e., there was no consistent difference in prevalence of goitre among those with high, moderate or low urinary iodine excretions.

Figure 14-1

NATIONAL AND INDIAN SURVEYS

CLINICAL ASSESSMENT OF GOITRE



[a]In National Survey (40-64 M&F, 65 + M&F).

14.4 SUMMARY

Goitre remains a significant problem in some parts of Canada, in spite of the universal mandatory iodization of table salt.

Marked regional and provincial differences in prevalence were found; goitre was observed in all groups beyond pre-school age in the prairie provinces, British Columbia and Newfoundland. The prevalence was lower in New Brunswick, Prince Edward Island, Quebec and Ontario and among Indians. The results for Nova Scotia were intermediate between these high and low prevalence areas. Only isolated cases of goitre were observed among Eskimos. The great majority of goitres observed were small in size, i.e., Grade I. Larger goitres (Grade II and III) were generally limited to a small percentage of females in western Canada. In pregnant women, larger goitres were observed in all regions except Quebec. This finding may not be of clinical significance since thyroid enlargement can occur in pregnancy.

Low urinary excretions of iodine/g creatinine were not observed very frequently indicating that there is a generous supply of iodine in the diet. The distribution patterns of iodine excretion also showed that a large percentage of individuals were consuming iodine in excess of physiological needs.

The urinary iodine excretions tended to be lower in the winter-spring than in the summer-fall period (unpublished data). In Quebec and British Columbia, this seasonal difference was observed consistently in all groups. The cause of this seasonal effect has not been ascertained, but it is conceivable that the difference reflected higher intakes of iodized salt during the summer-fall period.

Preliminary examination of the prevalence of goitre in individuals excreting different quantities of iodine did not suggest a relationship between iodine intake and goitre. On the other hand, iodine excretions were lowest in Quebec and among Eskimos where goitre was relatively uncommon. The possibility that the observed goitre was a result of long-term ingestion of moderately large amounts of iodine cannot be ruled out until further research is conducted into the nature of the abnormalities of the thyroid gland. It is also possible, however, that the goitre was due to the consumption of goitrogens, such as those found in cabbage. Potential sources of goitrogens will be examined in the future study of food consumption patterns.

In summary, endemic goitre of unknown clinical significance existed in some regions of the country. The etiology has not been identified, but iodine deficiency did not appear to be involved.

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CHAPTER 15 – CLINICAL RESULTS

Epidemiological studies of the nutritional status of populations in technologically advanced countries are not expected to detect overt nutritional diseases. If such cases exist, they are unlikely to be present at a nutrition survey clinic. This proved to be the case in Nutrition Canada; far-advanced nutritional disease, with the exception of obesity, was rarely observed. Nevertheless, a number of clinical abnormalities were recorded with sufficient frequency to warrant discussion.

The clinical data collected during Nutrition Canada included a number of syndromes and signs traditionally considered of value in the diagnosis of malnutrition (1, 2, 3). Table 15-1 lists the key clinical signs recorded in the medical examination. In analyzing the clinical results of Nutrition Canada, it was necessary to distinguish between signs with possible relevance to nutritional status (or otherwise of major clinical importance) and other observed signs. Decisions on relevance were based on staff and advisory committee expertise, prevalence data for each abnormality, sample size, review of the clinical criteria used by the examining physicians, variability between examiners, and consideration of the dietary and biochemical results.

The clinical findings for the national population revealed no major or consistent differences on the basis of season or population type. Sample sizes of age and sex groups for each province and for Indian and Eskimo populations were generally too small to make valid comparisons and caution should be used in interpreting modest differences in these data. The number of Eskimos surveyed was so limited that clinical lesions present at low prevalences could have been missed in the selected sample.

15.1 PROTEIN-CALORIE MALNUTRITION

This syndrome was evaluated in children under 6 years of age by examination for four clinical signs (Table 15-1). The clinical sign observed with appreciable frequency was a minor weight deficit, i.e., a body weight between 60 and 80% of the median weight for age (4) (see Table 15.2). National prevalence data for infants less than 1 year of age and children 1-4 years of age are presented in addition to combined data for 0-4 year olds. Small sample sizes prevented a similar subdivision by age for provincial, Indian or Eskimo data. Approximately 4% of the children aged 1-4 years had minor weight deficits, possibly reflecting suboptimal growth. However, as the intakes of total calories and protein were apparently adequate, the observed weight deficits were unlikely to have a simple nutritional origin. Further studies are required to identify the causative factors. As noted in Table 15.11, bilateral pretibial

pitting edema was not observed and only isolated cases of major weight deficits and painless pluckability of hair were found.

15.2 THIAMIN, RIBOFLAVIN, NIACIN AND FOLACIN DEFICIENCIES

Clinical evidence of deficiencies of thiamin, riboflavin, niacin and folacin was explored primarily by examination for nine clinical signs (Table 15-1). Three signs (nasolabial seborrhea; pellagrous or skin-fold dermatitis; abnormal pigmentation of the skin) were considered to have no obvious relevance to nutritional status in Canada and these are discussed briefly at the end of this chapter. The following six signs are discussed here because they may reflect nutritional status and are, regardless of cause, of public health interest.

Abnormally Smooth or Red Tongue

These lesions may be associated with deficiencies of folacin, riboflavin or niacin, with or without concomitant iron deficiency anemia. The examiners observed abnormally smooth tongues much more frequently than abnormally red tongues (Table 15.3) but the combined prevalences did not exceed 14% in any age-sex group. Generally, the lesions were observed in adults, primarily in those 65 years of age or older, and in older men more frequently than in older women. A review of the biochemical, total caloric and nutrient intake data suggested that the lesions may be due to simple or combined deficiencies of folacin, riboflavin and iron. The low food intake of the older persons and the accompanying difficulty in meeting micronutrient requirements were of particular concern in this regard. However, this interpretation is subject to revision by further studies. In view of the excellent niacin intakes throughout the population, it seemed unlikely that the lesions could be signs of pellagra.

Angular Lesions of the Lips or Eyelids

These lesions are generally thought to indicate riboflavin deficiency, but they may be due to other causes such as superficial infection, absence of teeth, or simply maceration resulting from excessive moisture in "normal" fleshy angles. In spite of these interpretive difficulties, the lesions were observed with sufficient frequency to warrant presentation of the data (Table 15.4). Differences in prevalences among areas were inconsistent and therefore considered unimportant. The occurrence of the lesions in Quebec was negligible compared with other provinces and probably reflected examiner differences.

TABLE 15-1

KEY CLINICAL SIGNS

SYNDROMES AND SIGNS	*AGE CATEGORIES*
Protein-calorie malnutrition	
Bilateral pretibial pitting edema	0-5 years
Major weight deficit (less than 0.6 of median for age)	0-5 years
Minor weight deficit (between 0.6 and 0.8 of median for age)	0-5 years
Painless pluckability of hair	0-5 years
Thiamin deficiency	
Absent knee and/or ankle jerks, bilateral	6+ years
Absent vibratory sense, ankle	6-54 years
Bilateral pretibial pitting edema	6+ years
Riboflavin deficiency	
Abnormally smooth or red tongue	all ages
Angular lesions of the eyelids or lips	all ages
Cheilosis	all ages
Nasolabial seborrhea	all ages
Niacin deficiency	
Pellagrous or skinfold dermatitis	6+ years
Abnormally smooth or red tongue	6+ years
Abnormal pigmentation of skin	6+ years
Vitamin C deficiency	
Scorbutic rosary	0-5 years
Diffuse bleeding of gums	all ages
Purpura or petechiae	all ages
Follicular hyperkeratosis, arms and/or back	all ages

TABLE 15-1 (cont'd)

SYNDROMES AND SIGNS	*AGE CATEGORIES*
Vitamin A deficiency	
Thickened opaque bulbar conjunctivae	6+ years
Follicular hyperkeratosis, arms and/or back	all ages
Rickets	
Rachitic rosary	all ages
Craniotabes	1 year
Bowed legs	0-5 years
Delayed walking (more than 18 months)	0-5 years
Folate or Vitamin B_{12} deficiency	
Abnormally smooth or red tongue	6+ years
Absent vibratory sense, ankle	6+ years

With few exceptions, the lesions were more commonly observed in the elderly than in the young and more prevalent in pregnant women than in non-pregnant women (20-39 years old). Together, the dietary, biochemical and clinical data on riboflavin were not sufficiently strong to conclude that a deficit existed in most of the population. Nevertheless, the higher prevalences of clinical lesions in older people merit further attention.

Cheilosis

Cheilosis is considered to be primarily an indication of riboflavin deficiency. It has multiple causes, including environmental exposure, and can be confused with severe chapping or sunburn. Nevertheless, because of the classical association of cheilosis with riboflavin deficiency, the data are presented (Table 15.5). The lesion was observed infrequently; the only striking observation was the moderately high prevalence among males 65 years of age and older in Saskatchewan (11.5%) and Alberta (16.3%). In both provinces, most cases were observed in metropolitan areas. No explanation can be currently offered for these findings.

Absent Knee and/or Ankle Jerks, Loss of Vibratory Sense, and Pretibial Pitting Edema

These three signs may be observed as clinical manifestations of thiamin deficiency (beriberi). Vibratory sense may be lost in vitamin B_{12} deficiency (pernicious anemia). However, in countries where the prevalence of degenerative vascular diseases – particularly atherosclerosis – is high, where sedentarism (and associated vascular stasis) is a predominant way of life, and where diabetes often aggravated by obesity is common, caution must be used in attributing these signs to vitamin deficiencies.

The prevalence of these signs was markedly higher in the older age groups and rose sharply among those over 64 years of age. Most of the observed neurological deficits (Tables 15.6 and 15.7) were best ascribed to the gradual neuropathy of atherosclerotic disease with or without concomitant diabetes. Some of the changes may have been due to congenital origin, alcoholism or thiamin deficits. Significantly, the intakes and urinary excretions of thiamin in older persons were sometimes unsatisfactory. Some clarification of the etiology of the clinical lesions may be possible when the analysis of the data concerning food and alcohol consumption is completed. There was no reason to suspect a dietary vitamin B_{12} deficiency problem in Canada.

The moderate differences in the prevalence of absent knee and/or ankle jerks among provincial, Indian and Eskimo populations did not appear to have clinical significance. They may have been the result of the relatively small

sample sizes and the differences in mean ages within the age categories. No major differences between the sexes existed and few cases were observed in children and pregnant women.

The small interprovincial variations in the prevalence of loss of vibratory sense also did not appear to indicate clinical differences. The sign occurred more frequently among older men than older women, possibly because peripheral vascular disease is commoner in men. Zero or very low prevalences among females in New Brunswick, Quebec, Prince Edward Island, and among Eskimo males may be partially explained by small sample sizes and examiner differences. Almost no cases were observed among children, adolescents or pregnant women.

Correlation of the results for individuals with the two neurological signs may reveal a relationship to thiamin deficiency in a limited proportion of the cases observed.

Pretibial pitting edema was found in approximately half the older women and a quarter of the older men. The high prevalences of dependent edema (Table 15.8), particularly in older women, were best attributed to atherosclerotic occlusive vascular disease, obesity, sedentarism, and vascular diseases associated with impaired venous return such as varicose veins. Some may have been due to frank congestive heart failure of atherosclerotic or hypertensive origin. Higher levels of physical activity and small sample sizes may explain the absence of edema among Eskimos. Examiner differences probably account for the lower prevalences in Quebec. The differences among other provinces and Indians did not appear to be clinically significant. The prevalence among pregnant women reflected the normal dependent edema of pregnancy.

15.3 VITAMIN C DEFICIENCY

Evidence of clinical scurvy was explored primarily by examination for four clinical signs as listed in Table 15-1. No cases of obvious scurvy or scorbutic rosary were noted (Table 15.11). Follicular hyperkeratosis, although commonly observed (Table 15.12), was considered to have no nutritional significance. Two clinical signs which could be manifestations of scurvy – diffuse bleeding of gums and purpura or petechiae – were observed.

Diffuse bleeding of gums is a common clinical observation in scurvy. In numerous surveys around the world (5), moderately high prevalences of the sign have been observed in population groups with mean or median serum vitamin C levels below 0.2 mg/100 ml. However, direct comparisons among different surveys are not always possible because of differences in biochemical methodology.

Although the sign, particularly if prevalent in 6 to 10% or more of the population, is considered to be presumptive evidence of scurvy, other factors, such as examiner differences, can markedly influence the recorded prevalence. Advanced periodontal disease is characterized by friable, easily bleeding gums. There is difficulty in establishing whether bleeding gums represent scorbutic gums, periodontal disease or both. The relationship between the disease and nutritional status has yet to be completely resolved. It is particularly prevalent in developing countries and in industrialized countries where personal oral hygiene is not regularly practised and dental care facilities are inadequate. The Nutrition Canada dental report may shed light on this problem.

In spite of these interpretive difficulties, the extremely high prevalence of bleeding gums among the adult Eskimos examined (Table 15.9) coupled with their very low vitamin C serum values and intakes, strongly suggested the presence of clinical scurvy. Eskimos were the only population with median serum vitamin C levels below 0.2 mg/100 ml. The vitamin C status of Indians (particularly those remote from urban areas) was between that of Eskimos and the national sample. In the national sample, the highest prevalences of bleeding gums were observed in young adults and pregnant women. Differences in prevalence existed among the provinces (Table 15.9), but the importance of this finding is uncertain.

Purpura or petechiae were observed in most of the provincial populations. The highest prevalences were seen among the middle-aged and elderly, but did not exceed 10% (Table 15.10). These signs were not seen in the Quebec or Eskimo surveys. No relationships with other evidence of vitamin C deficiency were apparent; the clinical lesions were probably manifestations of non-nutritional disorders accompanying ageing, e.g., increased telangiectatic lesions, bruising associated with capillary fragility and cutaneous atrophy, and ecchymoses of the lower limbs associated with vascular stasis and dependent edema.

15.4 CLINICAL SIGNS WITH ZERO OR LOW PREVALENCES CONSIDERED NUTRITIONALLY INSIGNIFICANT IN CANADA

Two key signs of malnutrition in children, bilateral pretibial pitting edema and scorbutic rosary, were not observed in this age group (Table 15.11).

Six other signs had very low prevalence rates (Table 15.11). Individual cases of major weight deficits were observed in the national and Indian samples. Several isolated cases of painless pluckability of hair without other classical signs of protein-calorie malnutrition were seen in 0-4 year-old children in the national sample. Individual cases of rachitic rosary were

observed in 5 year olds in the national sample. However, because this sign is partially subjective and the deformity not specific to vitamin D deficiency alone, the cases could not be definitely ascribed to vitamin D deficiency rickets. The same remarks apply to the cases of craniotabes in children under 1 year of age in the national sample and bowed legs in the national and Indian children under 5 years. Nasolabial seborrhea is non-specific and its identification so subjective that significance could not be attributed to the very low prevalence rates observed. The lesion was commonest in young adult women in the national and Indian samples; it was not seen in many of the younger and older age-sex groups.

15.5 CLINICAL SIGNS, WITH MODERATE PREVALENCES, CONSIDERED NUTRITIONALLY INSIGNIFICANT IN CANADA

Table 15.12 outlines five clinical signs considered to be of other than nutritional origin but which were observed with moderate-to-high frequencies. The data for delayed onset of walking indicated perhaps a cultural difference in child rearing among Indians and Eskimos as compared with the national population, rather than a higher prevalence of rickets in these groups. Thickened opaque bulbar conjunctivae continue to be designated as a sign of vitamin A deficiency in many nutrition surveys, including Nutrition Canada. The most commonly observed conjunctival thickenings, pingueculae (yellowish proliferative spots) and pterygia (wing-like proliferations), are more likely due to increasing age than nutritional deficiencies. The age relationship is evident from Table 15.12 Ethnic or racial origins and environmental exposure may also be contributing factors. The lesions occurred in men more than women but were rare among Eskimos. Conjunctival thickenings were more frequently observed in the Atlantic provinces. There was no evidence of xerosis conjunctivae, the conjunctival dryness seen as the earliest sign of xeropthalmia.

Follicular hyperkeratosis is another subjective sign which may be caused by environmental exposure, inadequate body cleanliness or fungus skin infections. It is clearly seen in experimentally induced scurvy in man and probably is a part of the total vitamin A deficiency syndrome. However, the sign is non-specific and its prevalence varied. The lesion was most commonly seen in school-aged children and adolescents, was generally commoner in females and was frequently seen in all three population samples.

Pellagrous or skin-fold dermatitis, although infrequently observed in the survey, was commonest in elderly women and was generally of the non-specific intertriginous skin-fold type. The low prevalence and the generally excellent niacin intakes suggested that these skin lesions were not signs of pellagra. They were rarely observed among Indians and not at all among Eskimos. The prevalence of abnormal pigmentations of the skin, a non-specific group of lesions, including melanotic spots and senile hyperkeratoses, was

higher in older groups of both sexes but the sign was not specifically related to nutritional status. Inexplicably, the prevalences in middle-aged and older men and women were generally higher in the prairie provinces and British Columbia.

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CHAPTER 16 – INFANTS AND CHILDREN

The distributions of nutrient intakes for infants under 1 year of age and children aged 1 through 4 years are given in Tables 16.1 through 16.8. The biochemical data concerning iron status are broken down in a similar manner and are presented in Tables 16.8 through 16.10. The dietary data for infants under 1 year of age do not include contributions from breast milk and therefore a small percentage of nutrient intakes are underestimated.

The median caloric intakes of children from 1 through 7 years were higher than generally recommended, although whether this is reflected in greater than desirable weights has not been determined. The median intakes of infants less than 1 year old and children 8-9 years were close to generally accepted standards.

Protein status was satisfactory in children. The median intakes were extremely high; in fact, for infants under 1 year of age the median intake was three times greater than the adequate standard.

Even though the median intakes of vitamin C were adequate, the serum values were suboptimal in 15 to 20% of the children in the national population and in the Indian bands close to urban centres. The vitamin C status of Indian Children from remote areas and Eskimo children was even less satisfactory.

The vitamin A status of children in the national population appeared satisfactory. The dietary and biochemical evidence in Indians and Eskimos showed poor vitamin A status but the deficiency had not reached the stage at which overt deficiency lesions occur.

The dietary intakes of many infants and children were below the standards for vitamin D but some vitamin D intakes in the national population were dangerously high due to the excessive use of supplements. Calcium intakes were adequate for children in the national population but the intakes were marginal for Indian children under 5 years and Eskimo children under 10 years of age. However, no evidence of deficiency was apparent from serum calcium and serum phosphorus values.

In the national population the median intake of iron was adequate for infants under 1 year of age. The median intake was influenced by the large numbers taking supplementary iron and by those with clearly inadequate intakes. However, there was little evidence of anemia in this group. Serum transferrin saturation values were only available for those 1 year of age and over and the prevalence of high risk values was substantial (11 to 13%). A small proportion of this group showed signs of mild anemia. The median

intakes of iron in children 1 through 4 years and 5 through 9 years, although lower than for children under 1 year of age, were in the adequate range. The state of iron reserves as judged by serum transferrin saturation values was much worse in Indian and Eskimo children than those in the national population although their median dietary intakes were similar.

Low serum folate values were found less frequently in children than in adults. Only a small percentage of children in the Indian and national populations had serum folate values at high risk, but over 25% of the Eskimo children had values in this category.

The status of riboflavin, niacin, thiamin and vitamin E appeared to be satisfactory. Some moderate risk urinary riboflavin values were observed in Indian children.

Goitre was not observed in this age group and iodine excretion appeared to be normal.

No clinical signs were found in children which could be directly attributed to specific nutrient deficiencies. Children under 6 years of age were examined for signs of rickets and protein-calorie malnutrition. A small percentage of children had moderate weight deficits which do not appear to be of nutritional origin in view of the adequate protein and energy intakes. Occasional isolated cases of craniotabes and rachitic rosary were observed but they do not appear to be indicative of rickets.

CHAPTER 17 – ADOLESCENTS

Boys between 8 and 18 years of age had median caloric intakes very close to the intakes recommended by WHO. In contrast, the median intakes of teenage girls, especially in 18 year olds, were below WHO requirements. The caloric intakes of Indians and Eskimos were consistently lower than those of the adolescents of the national population.

Protein intakes were more than adequate for teenage boys and girls, and were particularly high in Eskimo boys. Very few individuals were classified at risk on the basis of serum protein levels.

Median dietary intakes of thiamin, riboflavin and niacin were satisfactory for all teenagers. However, an estimated 10 to 20% of teenage boys and girls in the Indian and national populations had urinary thiamin excretions in the range of moderate risk. Eskimo teenagers did not show any biochemical evidence of thiamin deficiency. Teenage girls in the national sample had a small percentage (8%) of urinary riboflavin values at moderate risk, one of the highest prevalences found among all groups for this biochemical parameter.

Adolescents in national and Indian samples had adequate intakes of vitamin C and virtually no serum values were classified at high risk but 20 to 30% of values were in the moderate risk category. Adolescent Eskimos showed critical dietary shortages of vitamin C, with a high percentage of intakes below the inadequate level. Furthermore, an estimated 19 to 25% of this group had serum values classified at high risk.

The vitamin A status of teenagers in the national population was satisfactory. However, the situation of the Indians and especially the Eskimos warrants concern. Median intakes were marginal in boys and inadequate in girls and blood tests showed 10 to 25% with low values which were probably indicative of poor liver reserves.

Teenage girls in the national population had marginal intakes of vitamin D and calcium, while teenage boys had adequate calcium but marginal vitamin D intakes. Indian and Eskimo adolescents had consistently lower intakes which bordered on or were below the inadequate standard.

Adolescent girls in all population groups did not appear to be meeting their demands for iron. Median intakes were marginal and about a third of the national population and close to half of Indian and Eskimo populations had low iron stores according to serum transferrin saturation values. The iron status of adolescent boys in the national population appeared adequate.

However, iron status was less satisfactory in Indians and worse in Eskimos with over half having low serum transferrin values.

Serum folate values indicated a problem area for adolescents. In the national and Indian populations, 10% had values at high risk, while 40 to 50% of the adolescent Eskimos had values at high risk, indicating low folate stores.

Adolescent boys and girls in the national population, but not in the Indian and Eskimo populations, had Grade I goitre. This finding was mainly limited to the prairie provinces, British Columbia and Newfoundland. Iodine deficiency did not appear to be involved and the etiology of the goitre is still unidentified.

No clinical signs which could be directly related to nutritional status were observed among adolescents.

CHAPTER 18 – ADULTS

The median caloric intake of men in the national population was highest in the 20-39 year olds, and slightly lower in the 40-64 year olds. Caloric intakes of women were lower than generally accepted standards in the 40-64 year olds. Caloric intakes of Indian men and women and Eskimo men were slightly lower than those of the national population. The caloric intakes of Eskimo women were extremely low.

Elevated levels of serum cholesterol were found in adult men and women in the national population, whereas lower prevalences were found in Indians and very few adult Eskimo males were classified at risk. The proportion of women at risk was greater than that of men.

Although caloric intakes were lower in middle-aged adults than young adults, there was a greater prevalence of high risk Ponderal Index values (obesity) in the middle-aged, particularly among females. Also, more women than men in both age groups were classified at high risk in the national, Indian and Eskimo populations.

The protein intakes of adults were adequate and biochemical tests revealed very few low serum protein values, indicating that protein status was satisfactory.

Median dietary intakes of thiamin, riboflavin and niacin were satisfactory for young and middle-aged adults and were particularly high in Eskimos. Adults in the Indian and national populations showed low urinary excretions of thiamin. The prevalence was particularly high in males, placing 20 to 30% of them at moderate risk. A small percentage of adults in the Indian and national populations also had urinary riboflavin values at moderate risk.

The status of vitamin C appeared adequate for most adults in the national population. Indians, especially in the remote areas, had lower intakes and a higher prevalence of low serum vitamin C levels. Most adult Eskimos had intakes of ascorbic acid which were below the inadequate level and 40 to 80% had serum vitamin C levels classified at high risk.

The median intakes of vitamin A among men in the national and Indian populations were above the standard of adequacy. Intakes were lower among women and fell in the marginal range for the 40-64 year olds in the national population, and for Indian women aged 20-54 years. In the Eskimos, intakes were clearly inadequate for both men and women. The biochemical tests indicated that liver reserves of vitamin A were low among Indians and Eskimos whereas in the national population vitamin A reserves appeared satisfactory.

Calcium intakes were adequate for adults of both sexes in the national population but were lower in the Indians and Eskimos. The median intakes of Indian and Eskimo women and middle-aged Eskimo men were in the marginal range.

The median values of vitamin D intakes were in the range of 50 to 100 I.U./day for adults in Indian and national populations. Eskimo adults had extremely low intakes with 25 to 50% reporting no intake of vitamin D at all.

Men in the national, Indian and Eskimo populations had adequate median intakes of iron. Women in the national and Indian populations had marginal intakes very close to the inadequate level. Eskimo women had iron intakes close to or above the adequate level. Transferrin saturation values showed that women in the national population had lower iron stores than men and the problem of low iron reserves was more severe in Indian and Eskimo women. A small percentage of adults in the Indian and national populations had low hemoglobin values. There was a greater prevalence of low hemoglobin values in the Eskimos, particularly the middle-aged men in whom approximately one half had values classified at moderate risk.

Low serum folate levels were frequently observed among adults in the national, Indian and Eskimo populations, and the magnitude of the deficits was similar to that observed in other groups.

Thyroid enlargement was observed in a significant proportion of the adults in the national population. The incidence was highest (9.8%) in the 40-64 year-old women. It was observed infrequently in Indians and not at all in Eskimos. The etiology of this enlargement is at present unidentified, since iodine status appears satisfactory. This condition was observed mainly in the prairies, British Columbia and Newfoundland.

Clinical signs which may be related to nutritional status such as abnormally smooth tongue, angular lesions of the lips and eyelids, cheilosis, absent knee and/or ankle jerks, loss of vibratory sense and pretibial pitting edema were observed in these adult groups but to a much lesser degree than in the elderly. A high prevalence of bleeding gums, which was obserbed among adult Eskimos, may be directly related to insufficient vitamin C intake.

CHAPTER 19 – SENIOR ADULTS

The elderly, particularly the men, appeared to be the most vulnerable of any group to nutrient deficits according to the survey results.

The lowest caloric intakes were recorded in the elderly and were so low that micronutrient intakes were compromised. In spite of low caloric intakes, the degree of overweight was highest in the elderly, particularly in women in whom over a third were classified as obese. Elevated serum cholesterol values were also prevalent; over 50% of the women and 10% of the men had values classified at risk.

Dietary protein intakes were lower in the elderly, particularly in females, than in other groups and the median intakes were adequate but close to the marginal range. The greatest prevalence of low serum protein and albumin values was also observed in this age group.

Those over 64 years of age, particularly women, had the least satisfactory intakes of thiamin and riboflavin but, on the basis of biochemical tests, risk of thiamin deficiency appeared more frequently in men than women in the Indian and national populations. The dietary recalls indicated that niacin intakes were adequate. Elderly Eskimos had an abundance of the three B vitamins in their diet and the biochemical tests showed no evidence of deficiency.

Elderly men had the lowest intakes of ascorbic acid and many were classified at high or moderate risk on the basis of serum vitamin C levels. The problem was severe among Indians, particularly those living in remote areas, and was even more critical in Eskimos.

Vitamin A intakes were close to the marginal range but, according to the biochemical tests, vitamin A status was adequate in the national population. However, dietary and biochemical results indicated that the vitamin A status was less satisfactory in elderly Indians and Eskimos.

This age group had barely adequate calcium intakes, the lowest in the national sample. Median intakes of vitamin D of approximately 100 I.U. were low enough to be of concern if these individuals were confined indoors for long periods. The intakes of calcium and vitamin D were much lower in Indians and Eskimos. Some evidence of hypercalcemia was found in elderly women in the national population.

Dietary iron intakes in the elderly were the lowest of those in the adult groups and were barely high enough to meet the requirements. Mild anemia was most prevalent in elderly men. Iron stores, as measured by serum

transferrin saturation levels, were low in elderly males but not greatly different from those found in other male groups. The problem of low iron stores was less serious in elderly women than in the other female groups of the national population.

Low serum folic acid levels were observed in a large proportion of this population and the percentage of elderly at risk was similar to that observed in the other groups.

Iodine status appeared satisfactory since goitre was not observed to any great degree among the elderly and urinary iodine excretion was normal.

A number of clinical signs which may be related to nutritional status, e.g., abnormally smooth tongue, angular lesions of the lips and eyelids, cheilosis, absent knee and/or ankle jerks, loss of vibratory sense and pretibial pitting edema, were more commonly observed in the elderly than in other groups. Bleeding gums, which may be directly related to poor vitamin C status, were commonly observed in Eskimos.

CHAPTER 20 – PREGNANT WOMEN

Most pregnant women in the survey were referred by local health authorities and therefore the data probably show a more superior picture of health than would a probability sample of the population.

Energy intakes of pregnant women were higher than those of non-pregnant women but they were below generally accepted energy requirements for this physiological group. Indian pregnant women had lower intakes while the Eskimo intakes were so low that fetal growth could be adversely affected.

The median intakes of protein were above the standard of adequacy for all groups of pregnant women. About 10% of the national sample had serum protein values in the moderate risk category, but it is difficult to assess this finding because of the lowering of serum protein levels which is a normal occurence during pregnancy.

According to biochemical and dietary evidence, the vitamin C status was satisfactory for most pregnant women in the national population. However, among Indians, particularly those in remote communities, and Eskimos, there was evidence of poor vitamin C status.

The vitamin A status of the national population appeared to be satisfactory. Vitamin A intakes of Indians were adequate but lower than those of the national population and there was a higher prevalence of low serum values among Indians. Eskimo women had extremely low intakes, suggesting that their vitamin A status is cause for concern.

Calcium and vitamin D intakes were below the adequate standard in pregnant women but were higher than those of non-pregnant women. There was evidence of the use of vitamin D supplements and the intakes of some women were far in excess of physiological requirements. The median intake of Indians was marginal and among Eskimos was extremely inadequate with no evidence of supplementation.

The median iron intakes were marginal in the national and Indian populations but were adequate among Eskimos. The median intakes in all three population groups were elevated because of the use of supplements. However, the biochemical tests indicated that many pregnant women (9% of the national population and about one third of the Indian and Eskimo populations) had poor iron reserves.

Serum folate measurements indicated that over 10% of pregnant women in the national population, 25% of the Indians and almost 50% of the

Eskimos had values in the high risk category. Studies have shown that pregnant women with serum folate levels as low as those observed in the survey have a far greater tendency to develop megaloblastic bone marrow changes than pregnant women with higher serum levels.

Grade I goitre was observed in nearly 20% of pregnant women in the national population but was noted only infrequently among Indians and Eskimos. However, the clinical significance is uncertain since it is difficult to separate the normal thyroid enlargement of pregnancy from goitre induced by external factors.

There was no evidence of deficiencies of riboflavin, niacin, thiamin or vitamin E. There was also no evidence of clinical signs which could be directly attributable to any nutritional deficiencies.

Table 5.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF CALORIES

CAL/KG BODY WEIGHT/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 10	0.0%	0.0%	0.1%	1.5%	1.9%	0.8%	0.1%	2.3%	5.0%	3.1%	0.8%
10 - 20	0.3	0.0	1.2	5.1	7.7	25.1	4.3	16.5	21.1	32.0	10.6
20 - 30	0.4	0.1	6.8	12.9	26.7	27.6	15.9	19.1	33.2	42.7	26.1
30 - 40	0.7	1.0	7.8	19.1	30.6	31.7	21.4	28.3	25.4	15.0	30.3
40 - 50	2.1	3.6	15.0	20.8	16.7	9.7	16.4	17.0	11.2	5.8	17.0
50 - 60	4.3	10.3	16.1	19.7	7.0	3.0	15.0	9.4	2.4	0.4	7.6
60 - 70	5.3	13.2	16.6	8.1	4.8	0.6	13.3	4.1	0.8	0.3	3.7
70 - 80	4.4	14.2	10.9	4.6	1.8	0.3	4.8	1.8	0.2	0.0	0.9
80 - 90	13.4	13.4	7.5	2.4	0.8	0.8	2.5	0.3	0.0	0.0	0.9
90 - 100	11.1	10.4	5.4	2.5	1.0	0.0	2.3	0.3	0.0	0.1	0.5
100 - 110	9.8	7.7	3.9	1.2	0.1	0.0	1.3	0.1	0.1	0.0	0.4
110 - 120	9.7	6.7	3.1	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.2
120 - 130	9.0	5.4	1.1	0.0	0.1	0.0	0.4	0.0	0.0	0.0	0.1
130 - 140	6.1	5.7	1.3	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
140 - 150	6.0	1.8	1.0	1.3	0.0	0.0	0.2	0.0	0.0	0.0	0.1
150 - 160	3.4	1.8	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
160 - 170	3.2	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
170 - 180	2.8	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
180 - 190	0.9	0.6	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
190 - 200	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200 +	5.7	1.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
SAMPLE SIZE	1225	1315	1374	962	1190	849	1435	1303	1456	790	749
PERCENTILES											
5	55.68	50.08	25.34	16.17	15.20	13.85	20.22	13.52	9.77	11.59	16.13
25	85.14	67.97	47.16	32.01	25.80	19.71	31.51	23.37	19.55	16.96	25.75
50	107.86	86.10	61.11	45.69	34.56	28.88	45.93	34.66	27.37	23.08	33.79
75	136.04	111.15	80.56	57.54	44.24	35.07	61.04	44.41	34.60	28.73	43.59
95	209.57	156.89	121.26	91.41	68.28	49.48	97.19	64.67	48.27	43.20	66.38

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Table 5.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF CALORIES

CAL/KG BODY WEIGHT/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 10	0.1%	0.0%	0.6%	1.7%	0.7%	10.6%	2.0%	3.0%	9.8%	8.9%	2.0%
10 - 20	0.7	0.2	2.3	10.7	23.5	28.5	8.5	26.3	31.2	43.1	16.3
20 - 30	2.6	0.8	13.0	14.2	23.7	31.5	14.8	37.9	36.3	26.6	36.7
30 - 40	2.4	4.0	16.2	28.2	22.4	20.2	21.3	9.6	10.0	11.9	32.6
40 - 50	2.9	4.9	13.3	16.8	16.0	4.7	15.2	14.6	10.0	5.1	12.2
50 - 60	2.8	12.4	14.8	18.0	6.9	4.2	16.6	1.8	1.5	1.3	0.0
60 - 70	3.5	16.3	10.9	2.3	4.1	0.0	6.6	1.0	0.5	0.4	0.0
70 - 80	9.9	13.3	8.6	4.6	0.5	0.0	2.9	2.6	0.0	2.3	0.0
80 - 90	5.5	10.0	4.8	1.3	0.4	0.0	3.6	0.5	0.0	0.0	0.0
90 - 100	12.9	11.7	3.5	0.9	0.8	0.0	1.3	0.0	0.0	0.0	0.0
100 - 110	15.8	5.6	0.0	0.0	0.4	0.0	2.4	0.0	0.0	0.0	0.0
110 - 120	7.0	6.2	6.1	0.0	0.0	0.0	3.9	0.7	0.0	0.0	0.0
120 - 130	9.7	5.4	1.0	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0
130 - 140	2.6	2.4	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140 - 150	3.4	1.9	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
150 - 160	0.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160 - 170	3.1	1.2	1.1	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
170 - 180	2.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
180 - 190	1.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190 - 200	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200 +	7.3	0.3	0.4	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
SAMPLE SIZE	192	238	199	135	131	112	268	193	177	108	49
PERCENTILES											
5	33.07	39.57	24.30	15.15	12.63	8.03	13.62	10.40	7.92	7.51	12.26
25	79.93	61.11	36.37	27.83	20.41	15.67	29.94	18.73	15.89	14.90	22.23
50	103.03	78.57	52.88	38.01	31.21	23.77	41.95	26.28	21.24	19.47	29.30
75	127.83	101.53	76.25	50.04	41.83	31.58	57.61	38.16	29.00	28.51	35.97
95	215.70	146.00	123.76	75.59	64.58	44.71	105.40	74.65	44.32	47.43	44.81

Nutrition Canada

Table 5.3

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF CALORIES

CAL/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 250	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%
250 - 500	1.9	0.0	0.0	1.1	1.0	0.0	0.0	0.4	1.9	0.3	0.2
500 - 750	8.0	0.0	0.0	0.2	0.4	0.9	0.8	2.3	2.9	4.0	0.5
750 - 1000	13.2	1.7	0.7	0.7	1.4	2.3	2.5	5.8	6.9	11.1	1.6
1000 - 1250	14.6	5.5	1.7	2.9	2.2	6.9	7.8	9.8	9.5	18.6	4.5
1250 - 1500	17.1	8.5	1.5	2.2	4.2	15.1	7.5	7.5	16.6	19.8	10.2
1500 - 1750	17.6	13.7	5.0	1.9	4.2	12.3	11.1	13.9	16.8	16.9	12.2
1750 - 2000	8.8	12.9	5.2	5.8	10.9	17.6	14.2	13.9	19.0	14.1	13.0
2000 - 2250	6.8	16.3	11.9	5.4	16.0	10.1	11.3	12.2	8.3	5.5	13.2
2250 - 2500	3.3	9.5	7.1	6.6	10.4	10.3	10.7	9.1	6.1	2.9	10.9
2500 - 2750	2.0	10.6	8.5	8.3	9.5	7.5	7.9	10.3	4.7	5.2	9.7
2750 - 3000	1.5	7.4	10.4	7.1	6.6	6.3	7.5	4.9	2.9	0.4	6.6
3000 - 3250	1.0	4.4	8.5	10.3	8.6	2.1	5.1	3.4	1.2	0.1	4.1
3250 - 3500	0.7	3.5	6.6	4.1	5.4	2.8	4.8	1.9	0.6	0.2	4.2
3500 - 3750	0.5	2.0	6.8	7.6	5.3	2.1	2.3	1.2	0.6	0.0	1.8
3750 - 4000	0.4	0.8	4.8	8.0	2.9	0.8	1.2	0.9	0.2	0.0	2.0
4000 - 4250	0.2	0.7	4.8	4.4	2.1	0.3	0.9	0.1	0.3	0.0	0.5
4250 - 4500	0.2	0.5	1.4	3.5	1.2	0.0	0.8	0.5	0.1	0.0	1.0
4500 - 4750	0.0	0.4	2.9	2.5	1.7	0.2	0.7	0.2	0.0	0.0	0.6
4750 - 5000	0.0	0.3	1.4	3.0	1.7	0.1	0.2	0.1	0.0	0.0	0.1
5000 +	0.9	0.4	9.8	13.5	3.4	1.1	1.5	0.7	0.2	0.1	2.0
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	636.00	1202.00	1555.00	1240.00	1213.00	1046.00	1066.00	873.00	724.00	826.00	1168.00
25	1035.00	1669.00	2221.00	2421.00	2003.00	1475.00	1611.00	1445.00	1309.00	1152.00	1655.00
50	1406.00	2090.00	2952.00	3188.00	2465.00	1902.00	2127.00	1933.00	1653.00	1479.00	2150.00
75	1809.00	2663.00	3771.00	4105.00	3221.00	2478.00	2781.00	2493.00	2030.00	1814.00	2710.00
95	2874.00	3575.00	5674.00	6142.00	4796.00	3524.00	3921.00	3325.00	2821.00	2582.00	3910.00

Nutrition Canada

Table 5.4

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF CALORIES

CAL/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 250	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	2.5%	0.0%
250 - 500	2.1	0.6	0.0	1.0	0.0	4.6	1.8	1.5	2.1	0.0	2.0
500 - 750	6.7	0.5	0.6	2.1	0.7	8.0	1.8	3.8	7.1	9.5	2.0
750 - 1000	7.1	5.0	2.7	1.0	1.9	4.2	7.3	6.3	8.2	12.6	8.1
1000 - 1250	19.9	6.1	2.1	1.2	11.6	5.8	8.5	15.7	14.0	14.6	6.1
1250 - 1500	17.7	18.1	6.8	8.9	7.8	15.9	12.1	15.4	14.7	18.1	12.2
1500 - 1750	13.6	12.2	12.5	3.7	5.0	7.9	12.6	15.3	18.5	13.0	10.2
1750 - 2000	10.5	15.6	9.7	3.0	7.7	8.4	8.8	11.3	6.4	10.5	20.4
2000 - 2250	2.6	16.8	12.5	8.9	8.4	11.2	12.3	5.2	11.9	5.2	6.1
2250 - 2500	5.2	6.6	6.0	7.2	12.5	9.1	7.7	6.7	4.6	3.0	6.1
2500 - 2750	5.2	5.9	6.0	13.6	9.1	6.5	7.0	3.5	4.1	3.8	20.4
2750 - 3000	1.2	4.5	9.8	8.6	7.2	3.9	7.3	3.8	3.1	1.2	4.0
3000 - 3250	3.0	4.3	6.4	4.5	8.3	12.6	3.3	0.9	1.3	0.9	2.0
3250 - 3500	4.0	0.7	4.8	9.3	2.8	0.0	0.9	3.3	2.0	0.0	0.0
3500 - 3750	0.0	0.5	8.9	4.6	5.1	1.2	1.6	2.5	0.2	0.0	0.0
3750 - 4000	0.0	0.5	2.5	7.7	4.4	0.0	2.1	0.6	0.2	1.5	0.0
4000 - 4250	0.0	0.0	3.0	1.8	1.3	0.0	1.2	1.0	0.0	0.0	0.0
4250 - 4500	0.0	0.1	0.5	2.1	1.3	0.0	0.2	0.0	0.0	0.0	0.0
4500 - 4750	0.0	0.7	0.4	1.5	2.7	0.0	0.0	0.0	0.2	0.0	0.0
4750 - 5000	0.0	0.0	0.1	1.8	0.0	0.0	0.5	0.0	0.0	0.0	0.0
5000 +	0.2	0.3	3.7	6.5	1.2	0.0	2.1	2.3	0.0	2.6	0.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	625.00	947.00	1109.00	1167.00	1134.00	653.00	776.00	742.00	621.00	615.00	773.00
25	1129.00	1428.00	1769.00	2182.00	1690.00	1369.00	1427.00	1201.00	1143.00	1027.00	1381.00
50	1421.00	1848.00	2398.00	2735.00	2390.00	1794.00	1896.00	1619.00	1584.00	1418.00	1867.00
75	1902.00	2246.00	3125.00	3590.00	3145.00	2475.00	2531.00	2302.00	2052.00	1892.00	2526.00
95	3090.00	3091.00	4239.00	5179.00	4349.00	3230.00	3922.00	3725.00	2899.00	3145.00	2827.00

Nutrition Canada

Table 5.5

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM CHOLESTEROL

MG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 120	7.9%	1.4%	7.5%	1.2%	0.7%	0.0%	2.7%	0.5%	0.0%	0.5%	0.0%
120 - 130	4.1	4.6	3.8	3.1	0.1	0.3	3.4	0.8	0.3	0.1	0.0
130 - 140	12.9	7.8	10.7	3.7	1.6	0.5	10.9	3.0	0.9	0.3	0.1
140 - 150	15.2	11.1	13.9	4.0	1.6	1.5	14.6	7.3	3.6	0.7	0.9
150 - 160	14.4	16.1	14.9	4.7	3.2	2.7	14.6	8.6	2.6	2.0	0.9
160 - 170	14.9	15.1	16.5	9.6	5.4	4.7	15.3	11.6	3.6	1.1	2.0
170 - 180	8.1	12.9	12.6	8.5	7.7	13.1	12.2	11.9	7.6	2.4	2.5
180 - 190	7.7	13.3	6.9	12.5	9.4	15.2	11.0	12.9	10.2	3.5	4.5
190 - 200	6.2	6.0	5.4	13.3	12.3	7.3	5.1	10.7	9.1	4.4	5.0
200 - 210	2.0	3.1	3.6	6.2	9.9	10.3	3.6	10.1	9.8	17.0	6.4
210 - 220	2.6	4.8	1.8	8.2	12.7	10.6	2.5	7.6	7.3	10.3	7.7
220 - 230	2.5	2.1	0.7	4.7	9.8	9.1	1.8	4.0	9.1	8.1	8.1
230 - 240	0.4	0.7	0.2	6.7	7.1	8.6	0.7	4.0	9.7	5.0	9.4
240 - 250	0.0	0.0	0.2	6.1	6.5	4.8	0.1	1.5	8.7	14.0	8.4
250 - 260	0.5	0.1	0.3	1.0	3.5	1.7	0.5	1.1	4.2	4.5	9.0
260 - 270	0.0	0.0	0.1	1.7	2.6	1.8	0.0	1.0	4.2	9.5	8.7
270 - 280	0.0	0.0	0.1	2.2	1.2	2.7	0.0	1.6	3.8	5.0	6.6
280 - 290	0.0	0.0	0.0	0.5	0.4	0.4	0.1	0.2	0.7	1.7	4.3
290 - 300	0.0	0.0	0.0	0.3	0.6	1.6	0.0	0.3	1.2	3.5	4.2
300 - 310	0.0	0.0	0.0	0.8	0.8	1.4	0.0	0.0	0.9	2.5	2.5
310 +	0.0	0.1	0.0	0.1	1.8	0.8	0.0	0.3	1.5	2.8	7.9
SAMPLE SIZE	507	1203	1373	995	1195	882	1461	1318	1470	791	733
PERCENTILES											
5	114.00	127.00	115.00	131.00	151.00	159.00	127.00	141.00	149.00	170.00	174.00
25	139.00	149.00	141.00	168.00	185.00	181.00	144.00	164.00	185.00	204.00	214.00
50	156.00	165.00	159.00	191.00	207.00	203.00	161.00	184.00	211.00	228.00	242.00
75	175.00	183.00	176.00	218.00	229.00	228.00	180.00	206.00	241.00	260.00	270.00
95	214.00	216.00	206.00	263.00	270.00	276.00	216.00	246.00	276.00	302.00	321.00

Nutrition Canada

Table 5.6

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM CHOLESTEROL

MG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 120	16.9%	9.3%	6.1%	0.2%	0.4%	0.0%	12.0%	0.0%	0.5%	0.0%	0.0%
120 - 130	8.2	10.6	7.5	1.9	0.0	1.1	6.2	4.2	0.0	0.3	0.0
130 - 140	9.2	10.3	14.7	4.9	0.9	2.4	6.0	3.0	0.5	2.8	0.0
140 - 150	22.1	14.1	15.6	4.4	0.6	4.1	15.8	9.4	3.3	2.2	0.0
150 - 160	10.8	14.4	19.8	8.5	8.0	5.8	16.5	12.4	3.6	8.6	0.0
160 - 170	16.9	14.9	14.0	5.5	11.8	6.6	10.7	14.1	8.9	6.9	4.0
170 - 180	6.2	14.0	8.0	7.5	5.4	4.9	15.4	12.4	7.0	9.5	0.0
180 - 190	4.3	2.8	8.5	17.6	8.3	14.2	7.1	8.0	14.6	10.9	8.1
190 - 200	0.0	3.3	2.0	9.8	8.0	5.9	4.0	10.2	11.0	8.8	8.1
200 - 210	2.2	3.3	0.0	10.4	9.9	8.6	2.6	4.7	10.5	5.6	16.3
210 - 220	2.6	1.0	2.2	7.8	15.0	15.4	0.7	9.0	5.2	7.7	10.2
220 - 230	0.0	1.3	1.1	5.1	11.2	3.5	1.8	5.1	12.2	11.6	8.1
230 - 240	0.0	0.0	0.0	7.0	8.0	6.1	0.5	2.2	4.6	4.2	16.3
240 - 250	0.0	0.0	0.0	0.8	4.3	7.8	0.0	2.5	6.1	4.4	6.1
250 - 260	0.0	0.0	0.0	3.8	1.6	5.1	0.0	1.7	2.3	6.2	0.0
260 - 270	0.0	0.0	0.0	0.5	3.3	3.2	0.0	0.3	2.6	0.8	4.0
270 - 280	0.0	0.0	0.0	1.1	2.0	2.1	0.1	0.0	0.1	4.5	4.0
280 - 290	0.0	0.0	0.0	2.2	0.5	1.1	0.0	0.1	0.0	2.4	4.0
290 - 300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.7	4.0
300 - 310	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	3.4	0.4	2.0
310 +	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	1.1	0.6	4.0
SAMPLE SIZE	103	218	194	130	126	113	251	190	173	109	49
PERCENTILES											
5	106.00	105.00	118.00	136.00	155.00	144.00	113.00	133.00	152.00	146.00	183.00
25	128.00	134.00	137.00	168.00	176.00	179.00	140.00	156.00	182.00	174.00	201.00
50	147.00	153.00	153.00	189.00	205.00	202.00	155.00	175.00	201.00	199.00	222.00
75	162.00	170.00	166.00	217.00	225.00	233.00	172.00	201.00	227.00	227.00	247.00
95	189.00	200.00	190.00	254.00	262.00	264.00	202.00	239.00	293.00	278.00	307.00

Nutrition Canada

Table 5.7

NATIONAL SURVEY
CLASSIFICATION OF SERUM CHOLESTEROL VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]				11.3	10.2	4.1		13.8	32.0	25.3	
	M[b]				0.0	0.0	0.0		0.0	0.0	0.0	
	N[c]				369	405	262		465	493	252	
URBAN	H				12.8	9.1	13.2		13.2	40.3	30.9	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				322	424	315		446	486	299	
RURAL	H				15.9	13.7	15.8		16.6	31.8	34.5	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				304	366	305		407	491	240	
SUMMER-FALL	H				13.9	11.4	12.8		13.8	34.3	30.2	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				447	560	457		608	698	392	
WINTER-SPRING	H				12.0	10.5	8.3		14.8	33.4	28.3	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				548	635	425		710	772	399	
TOTAL	H				12.8	11.0	10.5		14.3	33.9	29.2	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				995	1195	882		1318	1470	791	

a. Percentage of population at high risk.
b. No moderate risk classification.
c. Number in sample.

Table 5.8

INDIAN SURVEY
CLASSIFICATION OF SERUM CHOLESTEROL VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]				6.1	4.5	11.4		10.1	27.8	19.9	
	M [b]				0.0	0.0	0.0		0.0	0.0	0.0	
	N [c]				72	68	60		97	94	55	
REMOTE	H				9.5	12.4	15.8		13.0	9.2	24.4	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				58	58	53		93	79	54	
ALGONKIAN	H				17.5	6.5	12.6		6.0	29.4	19.6	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				32	35	18		56	40	19	
IROQUOIAN	H				10.7	8.7	12.0		10.8	32.0	24.9	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				16	17	19		23	30	14	
PLAINS	H				5.3	5.4	14.1		14.3	17.5	13.7	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				25	39	41		35	55	29	
PLATEAU	H				0.0	8.2	27.9		7.6	6.5	12.2	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				28	15	13		33	24	17	
PACIFIC	H				2.5	15.1	0.0		14.0	15.0	48.3	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				22	20	17		34	17	20	
TOTAL [e]	H				7.8	7.6	13.2		11.6	21.3	21.6	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				130	126	113		190	173	109	
NATIONAL SURVEY TOTAL	H				12.8	11.0	10.5		14.3	33.9	29.2	
	M				0.0	0.0	0.0		0.0	0.0	0.0	
	N				995	1195	882		1318	1470	791	

a. Percentage of population at high risk.
b. No moderate risk classification.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 5.9

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM TRIGLYCERIDES

MG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 35	0.8%	1.9%	1.3%	0.0%	0.0%	0.0%	2.5%	0.6%	0.0%	0.0%	0.0%
35 - 55	12.7	7.2	9.6	2.5	0.9	0.5	15.6	6.0	5.0	1.5	0.0
55 - 75	10.8	16.8	19.2	3.9	2.4	2.7	27.8	21.1	18.1	14.8	0.6
75 - 95	9.1	35.2	18.7	9.6	3.0	8.5	19.7	12.3	13.9	9.6	0.6
95 - 115	26.1	9.3	13.3	11.2	11.3	14.8	11.5	17.8	11.4	5.4	4.0
115 - 135	9.0	6.4	15.8	8.8	8.0	14.4	9.9	8.4	12.3	19.9	8.7
135 - 155	2.1	8.7	4.1	7.8	15.6	7.8	4.4	11.6	9.7	14.4	10.0
155 - 175	1.0	2.1	4.7	4.4	20.4	7.6	2.6	6.3	7.0	8.9	14.7
175 - 195	2.3	2.5	0.9	6.9	4.9	5.5	0.3	9.1	4.8	1.8	6.7
195 - 215	9.9	3.2	6.1	14.8	2.8	3.3	1.7	1.5	3.2	3.6	12.0
215 - 235	2.4	1.5	2.2	8.0	8.5	15.9	0.7	1.0	5.7	5.1	7.3
235 - 255	2.9	1.3	0.7	3.3	3.0	0.9	0.4	0.4	0.3	2.9	4.0
255 - 275	1.4	0.3	0.6	1.7	1.3	5.6	0.7	0.2	1.2	0.9	6.0
275 - 295	0.1	1.1	0.2	12.2	3.7	2.4	1.1	1.4	1.9	0.9	4.6
295 - 315	2.9	1.0	0.0	0.1	3.9	2.0	0.0	1.2	0.5	0.6	0.6
315 - 335	0.0	0.6	0.7	1.6	1.7	2.1	0.0	0.1	0.4	0.8	7.3
335 - 355	1.2	0.0	0.5	0.1	0.8	0.0	0.0	0.0	0.2	2.8	1.3
355 - 375	0.5	0.0	0.1	0.2	0.4	0.2	0.0	0.1	0.0	1.8	0.6
375 - 395	2.2	0.0	0.0	0.7	3.3	1.1	0.0	0.0	0.0	0.5	2.6
395 - 415	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	2.0
415 +	1.4	0.0	0.2	1.1	3.0	3.5	0.4	0.1	3.3	2.7	5.3
SAMPLE SIZE	163	341	394	196	225	254	418	427	344	228	149
PERCENTILES											
5	42.00	42.00	44.00	66.00	87.00	83.00	43.00	49.00	54.00	67.00	108.00
25	75.00	73.00	71.00	106.00	128.00	113.00	58.00	70.00	81.00	94.00	156.00
50	104.00	86.00	95.00	178.00	165.00	157.00	77.00	105.00	118.00	130.00	202.00
75	204.00	123.00	131.00	220.00	232.00	221.00	108.00	154.00	166.00	175.00	272.00
95	350.00	228.00	220.00	288.00	392.00	349.00	195.00	212.00	284.00	366.00	426.00

Nutrition Canada

Table 5.10

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM TRIGLYCERIDES

MG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 35	2.0%	7.0%	3.2%	4.5%	0.0%	0.0%	2.5%	0.0%	4.4%	0.0%	0.0%
35 - 55	6.9	16.4	13.7	6.7	5.4	12.2	17.0	8.8	0.0	1.3	0.0
55 - 75	46.8	27.8	23.8	33.2	3.7	18.2	17.1	11.1	9.5	18.4	0.0
75 - 95	13.5	10.1	15.7	18.1	4.6	5.9	26.9	16.3	12.2	19.2	23.0
95 - 115	12.7	19.2	20.3	13.6	2.5	14.9	8.4	19.5	14.3	8.3	7.6
115 - 135	4.9	9.1	7.5	0.9	7.2	7.4	13.9	11.1	9.2	7.4	0.0
135 - 155	5.6	5.3	3.1	1.7	8.4	6.2	10.5	12.4	7.4	6.0	7.6
155 - 175	0.0	3.8	1.2	5.6	5.4	8.7	1.4	3.7	6.5	6.2	30.7
175 - 195	0.0	0.0	9.0	3.1	26.7	6.5	0.4	1.3	14.5	8.3	0.0
195 - 215	0.0	0.9	0.0	3.0	3.7	8.7	0.2	1.1	3.0	3.3	15.3
215 - 235	0.0	0.0	0.0	0.0	0.0	2.3	0.0	4.8	3.6	4.5	7.6
235 - 255	0.0	0.0	0.8	5.8	0.0	0.0	0.2	0.0	3.4	8.7	7.6
255 - 275	0.0	0.0	0.0	0.0	0.0	8.4	1.1	3.0	3.5	0.0	0.0
275 - 295	0.0	0.0	0.0	3.1	7.2	0.0	0.0	0.0	0.0	0.0	0.0
295 - 315	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.7	2.1	2.0	0.0
315 - 335	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
335 - 355	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.0	0.0
355 - 375	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
375 - 395	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
395 - 415	0.0	0.0	0.0	0.0	2.7	0.0	0.0	3.2	0.0	0.0	0.0
415 +	0.0	0.0	0.0	0.0	19.7	0.0	0.0	1.6	4.6	4.7	0.0
SAMPLE SIZE	29	77	63	28	22	22	86	63	55	27	13
PERCENTILES											
5	37.00	22.00	43.00	37.00	37.00	41.00	41.00	43.00	57.00	57.00	75.00
25	62.00	57.00	66.00	60.00	137.00	72.00	60.00	82.00	88.00	92.00	104.00
50	70.00	72.00	92.00	89.00	190.00	113.00	80.00	102.00	149.00	122.00	162.00
75	104.00	100.00	114.00	110.00	292.00	183.00	124.00	145.00	189.00	189.00	196.00
95	320.00	154.00	178.00	238.00	507.00	260.00	153.00	347.00	350.00	387.00	236.00

Nutrition Canada

Table 5.11

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF PONDERAL INDEX

	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 10.00				0.0%	0.0%	0.0%		1.1%	0.7%	0.2%	
10.00 - 10.25				0.0	0.0	0.0		0.6	0.7	1.7	
10.25 - 10.50				0.0	0.0	0.0		0.4	0.8	4.3	
10.50 - 10.75				0.0	0.1	0.2		1.4	1.5	1.8	
10.75 - 11.00				0.1	0.2	0.4		1.1	4.3	9.2	
11.00 - 11.25				1.3	3.0	4.8		2.0	4.3	5.9	
11.25 - 11.50				2.1	3.4	2.7		2.7	7.7	13.3	
11.50 - 11.75				4.1	8.7	8.0		3.6	9.3	13.4	
11.75 - 12.00				8.1	10.8	18.1		6.8	9.7	11.2	
12.00 - 12.25				14.4	16.8	14.5		7.8	12.9	11.5	
12.25 - 12.50				11.8	18.0	16.9		14.8	12.7	6.9	
12.50 - 12.75				16.9	15.1	10.2		16.8	13.3	6.1	
12.75 - 13.00				14.4	9.9	12.4		12.5	9.7	7.3	
13.00 - 13.25				8.9	5.3	4.6		12.7	4.8	3.9	
13.25 - 13.50				7.0	3.5	2.7		9.2	3.1	0.8	
13.50 - 13.75				6.0	3.0	2.3		4.4	3.0	0.9	
13.75 - 14.00				3.2	1.1	1.0		1.0	0.2	0.2	
14.00 - 14.25				0.1	0.4	0.2		0.2	0.5	0.1	
14.25 - 14.50				0.0	0.0	0.0		0.0	0.0	0.3	
14.50 - 14.75				0.8	0.0	0.1		0.0	0.0	0.0	
14.75 +				0.0	0.0	0.0		0.0	0.0	0.0	
SAMPLE SIZE				980	1206	862		1317	1469	800	
PERCENTILES											
5				11.60	11.34	11.19		11.06	10.84	10.47	
25				12.19	11.96	11.90		12.13	11.60	11.28	
50				12.59	12.36	12.27		12.56	12.20	11.73	
75				13.04	12.70	12.71		13.03	12.70	12.36	
95				13.68	13.46	13.33		13.55	13.33	13.05	

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Table 5.12

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF PONDERAL INDEX

	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 10.00				0.0%	0.7%	0.4%		1.0%	1.9%	2.5%	
10.00 - 10.25				2.8	0.0	0.0		0.2	3.6	0.0	
10.25 - 10.50				0.0	0.5	0.0		0.4	3.9	2.2	
10.50 - 10.75				0.0	0.5	0.9		6.2	7.9	1.9	
10.75 - 11.00				0.2	3.2	4.2		3.1	7.2	10.4	
11.00 - 11.25				0.7	5.9	6.5		4.3	6.6	15.1	
11.25 - 11.50				3.4	3.9	2.4		7.8	17.9	16.3	
11.50 - 11.75				6.5	14.4	10.1		12.3	10.9	10.6	
11.75 - 12.00				14.8	3.9	10.0		7.1	8.9	8.1	
12.00 - 12.25				6.8	12.5	16.1		11.2	7.9	9.9	
12.25 - 12.50				11.0	15.0	18.4		15.8	9.4	9.1	
12.50 - 12.75				14.7	15.9	7.5		10.1	3.9	0.4	
12.75 - 13.00				12.9	12.6	7.0		6.2	3.8	5.8	
13.00 - 13.25				7.8	2.3	9.7		7.5	2.3	3.1	
13.25 - 13.50				8.5	1.1	1.6		3.1	1.4	0.9	
13.50 - 13.75				2.8	7.0	2.9		0.6	0.7	2.0	
13.75 - 14.00				4.5	0.0	0.7		0.5	0.5	1.0	
14.00 - 14.25				0.8	0.0	0.9		1.0	0.0	0.0	
14.25 - 14.50				1.2	0.0	0.0		0.6	0.0	0.0	
14.50 - 14.75				0.0	0.0	0.0		0.0	0.4	0.0	
14.75 +				0.0	0.0	0.0		0.0	0.0	0.0	
SAMPLE SIZE				135	130	114		194	178	109	
PERCENTILES											
5				11.31	11.17	10.99		10.70	10.15	10.53	
25				11.97	11.63	11.75		11.56	11.00	11.14	
50				12.56	12.29	12.22		12.19	11.51	11.53	
75				13.04	12.71	12.63		12.64	12.21	12.13	
95				13.84	13.52	13.38		13.33	13.03	13.13	

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Table 5.13

NATIONAL SURVEY
ASSESSMENT OF PONDERAL INDEX

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]				3.5	6.7	6.8		8.3	17.5	38.8	
	M[b]				36.6	59.1	59.5		35.1	41.2	44.3	
	N[c]				375	414	267		487	506	270	
URBAN	H				4.0	9.5	12.8		11.1	21.4	40.5	
	M				40.7	51.0	61.9		25.3	50.5	31.5	
	N				320	433	300		433	484	290	
RURAL	H				6.0	5.9	6.8		12.3	27.7	31.0	
	M				39.0	49.7	52.8		35.4	44.3	49.8	
	N				285	359	295		397	479	240	
SUMMER-FALL	H				5.8	9.9	9.4		7.8	21.5	34.0	
	M				35.9	49.2	64.4		33.5	44.1	40.1	
	N				442	563	448		610	702	401	
WINTER-SPRING	H				3.0	4.3	7.1		12.0	20.4	39.8	
	M				40.1	59.7	51.1		32.1	44.2	45.7	
	N				538	643	414		707	767	399	
TOTAL	H				4.3	7.2	8.2		9.9	20.9	36.9	
	M				38.2	54.3	57.7		32.8	44.1	43.0	
	N				980	1206	862		1317	1469	800	

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Nutrition Canada

Table 5.14

INDIAN SURVEY
ASSESSMENT OF PONDERAL INDEX

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]				12.9	14.4	15.0		28.1	53.3	42.7	
	M [b]				39.6	43.8	50.4		49.6	36.4	46.2	
	N [c]				77	70	60		99	96	55	
REMOTE	H				1.7	17.0	15.3		18.8	42.3	61.8	
	M				38.9	48.0	60.1		43.6	38.9	21.0	
	N				58	60	54		95	82	54	
ALGONKIAN	H				3.6	20.2	7.4		19.5	60.4	35.8	
	M				42.4	44.6	41.6		57.7	31.9	52.2	
	N				32	35	18		56	39	18	
IROQUOIAN	H				10.1	4.1	32.4		19.1	50.3	37.0	
	M				45.1	35.7	43.6		65.2	38.6	46.4	
	N				17	18	19		25	32	13	
PLAINS	H				6.9	11.8	1.4		22.4	32.5	53.6	
	M				34.9	49.7	70.3		41.5	50.3	32.0	
	N				24	42	41		36	56	32	
PLATEAU	H				0.0	15.9	21.6		15.1	56.0	40.0	
	M				22.0	30.3	38.9		41.8	14.0	43.7	
	N				29	14	13		33	25	15	
PACIFIC	H				20.0	31.2	55.5		33.7	81.6	86.5	
	M				56.9	47.7	39.3		39.7	13.7	9.7	
	N				26	21	18		35	19	21	
TOTAL [e]	H				7.3	15.4	15.1		23.4	49.4	49.9	
	M				39.2	45.4	54.3		46.6	37.3	36.7	
	N				135	130	114		194	178	109	
NATIONAL SURVEY TOTAL	H				4.3	7.2	8.3		9.9	20.9	36.9	
	M				38.2	54.3	57.7		32.8	44.1	43.0	
	N				980	1206	862		1317	1469	800	

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 6.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY PROTEIN

G/KG BODY WEIGHT/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 0.50	0.3%	0.0%	0.9%	1.6%	6.4%	7.1%	2.6%	7.6%	10.7%	13.7%	3.7%
0.50 - 0.75	0.3	0.2	3.0	7.9	9.9	25.4	7.1	13.0	20.0	32.8	9.3
0.75 - 1.00	0.7	0.9	3.5	11.1	21.3	23.6	10.8	15.4	22.6	26.1	20.5
1.00 - 1.25	0.0	1.0	9.0	9.8	17.6	16.1	14.2	19.1	18.8	13.4	15.0
1.25 - 1.50	1.0	4.3	11.0	14.8	14.0	12.3	13.9	16.2	14.0	7.7	19.8
1.50 - 1.75	2.0	5.1	7.9	18.4	13.0	9.8	13.1	8.9	6.5	3.7	12.8
1.75 - 2.00	2.9	5.9	9.0	8.8	6.2	2.6	12.5	6.2	2.9	1.8	7.6
2.00 - 2.25	3.9	9.4	12.9	7.0	5.2	1.3	6.9	5.6	0.7	0.2	4.2
2.25 - 2.50	2.5	7.5	7.1	5.9	3.1	0.1	5.3	4.0	1.1	0.1	2.4
2.50 - 2.75	4.1	12.1	8.7	4.9	0.8	0.2	4.4	1.4	1.8	0.0	1.3
2.75 - 3.00	8.3	10.1	6.5	2.4	0.5	0.7	2.6	0.7	0.2	0.0	0.8
3.00 - 3.50	10.5	12.0	9.9	3.7	0.4	0.3	2.8	0.7	0.0	0.0	0.9
3.50 - 4.00	11.1	11.4	3.9	0.5	0.2	0.0	1.1	0.4	0.0	0.0	0.2
4.00 - 4.50	10.4	7.8	2.6	1.2	0.5	0.0	1.1	0.1	0.0	0.0	0.0
4.50 - 5.00	13.8	3.6	0.8	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2
5.00 - 5.50	8.2	4.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
5.50 - 6.00	4.8	1.4	0.5	1.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0
6.00 - 6.50	4.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
6.50 - 7.00	2.9	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.00 - 7.50	1.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
7.50 +	5.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
SAMPLE SIZE	1225	1315	1374	962	1190	849	1435	1303	1456	790	749
PERCENTILES											
5	1.78	1.38	0.81	0.57	0.47	0.48	0.62	0.42	0.38	0.40	0.55
25	2.98	2.17	1.46	1.14	0.87	0.64	1.09	0.86	0.68	0.63	0.89
50	4.06	2.82	2.07	1.54	1.16	0.93	1.50	1.18	0.95	0.78	1.27
75	5.15	3.75	2.78	2.07	1.57	1.29	2.01	1.63	1.27	1.02	1.61
95	7.73	5.41	4.16	3.33	2.33	1.82	3.27	2.42	1.99	1.64	2.40

Table 6.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY PROTEIN

G/KG BODY WEIGHT/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 0.50	0.1%	1.1%	3.2%	3.7%	5.3%	14.1%	8.4%	9.7%	22.0%	27.4%	6.1%
0.50 - 0.75	1.1	0.1	5.4	14.5	18.8	27.0	11.3	26.0	21.9	21.7	20.4
0.75 - 1.00	3.0	2.7	3.7	15.2	19.7	20.8	11.1	17.2	19.2	25.9	18.3
1.00 - 1.25	1.4	2.5	14.7	14.5	7.9	10.8	13.1	15.9	16.7	9.9	22.4
1.25 - 1.50	0.5	7.7	14.5	7.6	19.0	13.6	10.5	10.0	8.1	4.1	10.2
1.50 - 1.75	2.6	4.4	9.3	13.8	8.3	3.7	9.7	4.2	5.9	3.1	10.2
1.75 - 2.00	3.8	7.3	10.4	11.6	5.3	4.3	7.2	8.8	2.6	1.1	2.0
2.00 - 2.25	2.8	9.6	8.3	8.3	10.2	3.6	6.4	3.1	0.0	4.5	6.1
2.25 - 2.50	2.9	11.1	5.8	2.6	0.6	0.0	10.7	0.8	0.6	1.6	2.0
2.50 - 2.75	7.2	8.1	6.3	1.4	0.4	0.0	2.3	0.8	1.0	0.1	0.0
2.75 - 3.00	3.7	6.8	2.5	1.9	0.9	1.5	0.7	0.0	0.8	0.0	0.0
3.00 - 3.50	9.9	13.8	6.2	0.8	0.9	0.3	4.2	0.7	0.1	0.0	2.0
3.50 - 4.00	12.4	6.5	4.6	2.8	0.0	0.0	1.5	1.0	0.1	0.0	0.0
4.00 - 4.50	10.8	5.7	1.7	0.0	1.1	0.0	1.9	0.0	0.0	0.0	0.0
4.50 - 5.00	12.6	3.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.00 - 5.50	8.3	3.9	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
5.50 - 6.00	4.5	3.9	0.6	0.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0
6.00 - 6.50	0.9	1.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
6.50 - 7.00	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.00 - 7.50	2.3	0.0	0.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
7.50 +	5.8	0.1	0.6	0.0	0.0	0.0	0.0	0.7	0.4	0.0	0.0
SAMPLE SIZE	192	238	199	135	131	112	268	193	177	108	49
PERCENTILES											
5	1.09	1.15	0.54	0.55	0.48	0.35	0.35	0.30	0.28	0.26	0.45
25	2.73	1.90	1.19	0.88	0.75	0.58	0.84	0.66	0.56	0.48	0.72
50	3.96	2.67	1.70	1.33	1.16	0.87	1.36	0.96	0.80	0.75	1.04
75	4.99	3.39	2.48	1.88	1.59	1.27	2.16	1.36	1.09	0.98	1.32
95	8.10	5.51	3.98	2.96	2.35	2.02	3.28	2.24	1.86	2.05	2.22

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Table 6.3

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY PROTEIN

G/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 20	3.6%	0.0%	0.2%	1.4%	1.1%	0.3%	1.7%	0.4%	3.1%	0.8%	0.5%
20 - 40	25.1	10.1	2.6	2.4	4.9	10.4	9.6	15.1	14.7	28.6	5.8
40 - 60	38.2	23.2	10.3	7.7	12.7	30.5	19.8	22.8	34.4	40.7	19.9
60 - 80	18.0	34.4	17.7	12.1	24.4	25.1	29.7	27.6	27.4	14.4	24.7
80 - 100	9.1	16.6	21.8	14.9	21.6	16.2	20.6	15.5	10.7	12.6	22.3
100 - 120	2.2	9.0	14.8	18.3	12.5	11.8	9.8	9.2	4.6	1.4	14.8
120 - 140	1.5	3.0	10.5	14.5	9.9	2.5	4.9	3.6	3.6	1.1	6.2
140 - 160	0.5	1.2	9.3	10.8	7.1	1.5	1.9	3.9	0.7	0.0	2.2
160 - 180	0.5	0.4	3.8	4.4	2.3	0.3	1.0	0.4	0.1	0.0	1.6
180 - 200	0.1	1.3	3.2	3.1	1.5	0.1	0.2	0.8	0.2	0.0	0.5
200 - 220	0.0	0.0	1.5	4.2	0.4	0.0	0.1	0.0	0.0	0.0	0.3
220 - 240	0.0	0.2	1.7	1.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0
240 - 260	0.0	0.0	0.5	1.7	0.4	0.6	0.1	0.0	0.0	0.0	0.0
260 - 280	0.0	0.0	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1
280 - 300	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2
300 - 320	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
320 - 340	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
340 - 360	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1
360 - 380	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
380 - 400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400 +	0.6	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	22.30	30.60	45.00	49.20	37.60	35.10	28.30	29.70	26.10	26.90	37.10
25	38.10	54.20	71.80	81.30	64.80	49.90	53.90	48.90	44.40	38.60	58.60
50	51.60	69.40	96.20	110.50	85.00	67.20	73.00	66.60	59.60	49.30	79.00
75	65.40	88.60	136.60	147.50	114.90	89.20	93.80	89.00	74.20	66.20	101.30
95	103.50	131.40	204.70	225.10	168.30	121.70	132.60	143.50	118.50	97.20	141.20

Table 6.4

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY PROTEIN

G/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 20	6.1%	2.0%	1.2%	1.7%	2.1%	3.0%	6.3%	3.8%	5.6%	7.6%	2.0%
20 - 40	16.6	15.2	7.5	9.1	6.9	14.3	16.6	17.2	19.7	24.3	14.2
40 - 60	38.1	30.8	17.6	13.2	18.7	23.5	26.6	30.5	25.5	30.8	26.5
60 - 80	21.0	26.6	23.4	9.2	15.7	24.4	17.5	15.4	29.5	18.8	18.3
80 - 100	9.1	16.5	20.2	21.3	21.2	15.5	14.0	20.4	9.3	9.9	16.3
100 - 120	6.5	4.8	12.4	15.2	9.6	8.8	11.5	5.4	3.5	0.7	10.2
120 - 140	2.2	2.4	8.2	13.2	11.8	5.8	2.5	2.3	4.2	4.5	10.2
140 - 160	0.0	0.4	4.2	3.0	6.9	1.4	3.0	1.7	0.4	0.1	0.0
160 - 180	0.0	0.7	1.2	4.8	0.9	0.5	0.5	1.0	0.3	2.6	0.0
180 - 200	0.0	0.1	1.0	2.7	2.5	1.5	0.1	0.7	1.5	0.0	0.0
200 - 220	0.0	0.0	1.2	2.1	0.5	0.7	0.4	0.0	0.0	0.1	2.0
220 - 240	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
240 - 260	0.0	0.0	0.0	0.5	0.4	0.0	0.1	0.0	0.0	0.0	0.0
260 - 280	0.0	0.0	0.1	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
280 - 300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
300 - 320	0.0	0.0	0.0	0.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0
320 - 340	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
340 - 360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
360 - 380	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
380 - 400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400 +	0.0	0.0	0.2	0.0	1.1	0.0	0.0	1.2	0.0	0.0	0.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	16.60	28.90	30.60	37.60	35.10	28.70	14.20	21.80	18.30	13.20	29.50
25	41.70	46.10	56.80	64.80	55.80	48.70	40.50	43.40	39.90	31.80	46.70
50	55.90	61.20	80.00	94.60	83.60	66.80	60.30	59.20	58.90	50.80	64.50
75	75.00	80.80	104.80	128.30	125.10	89.70	90.00	85.00	77.40	69.20	93.00
95	111.00	110.50	158.10	216.80	187.10	126.80	136.40	137.90	120.50	124.10	128.80

Nutrition Canada

Table 6.5

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM PROTEIN

G/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 4.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
4.00 - 4.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.20 - 4.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.40 - 4.60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.60 - 4.80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.80 - 5.00	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
5.00 - 5.20	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.20 - 5.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
5.40 - 5.60	0.2	0.0	0.0	0.3	0.4	0.0	0.0	0.0	0.3	0.2	0.6
5.60 - 5.80	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	1.7
5.80 - 6.00	0.8	0.3	0.0	0.5	0.0	0.0	0.2	0.6	0.0	0.5	6.6
6.00 - 6.20	3.1	2.3	0.6	0.1	0.5	1.0	0.1	0.6	0.5	0.0	16.6
6.20 - 6.40	8.5	4.0	0.8	0.5	1.3	4.3	1.4	1.1	3.6	7.2	23.9
6.40 - 6.60	12.2	8.9	3.3	0.8	4.3	4.1	2.4	3.7	4.4	7.1	22.3
6.60 - 6.80	24.3	15.9	11.4	6.4	12.5	12.0	8.8	9.4	12.3	11.5	14.9
6.80 - 7.00	21.3	22.2	17.8	15.0	13.9	14.0	16.4	18.0	18.2	16.2	6.5
7.00 - 7.20	11.4	18.7	21.3	21.8	20.0	15.8	20.6	19.4	19.9	16.1	3.9
7.20 - 7.40	6.7	12.4	19.1	17.4	18.6	17.3	16.9	22.1	14.4	17.6	1.4
7.40 - 7.60	8.7	6.8	11.2	16.4	12.8	15.2	16.6	10.9	15.5	12.0	0.4
7.60 - 7.80	1.9	3.5	7.9	8.1	10.9	4.1	6.7	7.8	2.3	5.7	0.2
7.80 +	0.2	4.4	6.2	11.8	4.1	11.5	9.3	5.8	7.6	5.3	0.0
SAMPLE SIZE	533	1223	1394	1004	1208	894	1475	1333	1492	808	734
PERCENTILES											
5	6.24	6.32	6.60	6.69	6.53	6.38	6.61	6.54	6.41	6.29	5.88
25	6.59	6.71	6.89	7.00	6.87	6.87	6.95	6.90	6.84	6.78	6.18
50	6.80	6.97	7.15	7.22	7.17	7.16	7.19	7.15	7.08	7.06	6.39
75	7.07	7.24	7.40	7.53	7.44	7.47	7.49	7.39	7.40	7.39	6.62
95	7.49	7.74	7.85	7.93	7.77	7.96	7.96	7.83	7.86	7.82	7.04

Nutrition Canada

Table 6.6

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM PROTEIN

G/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 4.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4.00 - 4.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.20 - 4.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.40 - 4.60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.60 - 4.80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.80 - 5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.00 - 5.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.20 - 5.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.40 - 5.60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
5.60 - 5.80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.80 - 6.00	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.00 - 6.20	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.8	6.2
6.20 - 6.40	0.0	1.9	0.1	0.2	0.7	0.7	0.0	0.0	0.3	0.5	14.5
6.40 - 6.60	2.4	2.5	4.2	1.1	1.3	2.8	2.5	0.4	2.2	0.5	25.0
6.60 - 6.80	14.8	8.3	5.5	0.9	7.1	5.3	7.0	1.0	2.4	3.4	18.7
6.80 - 7.00	19.8	19.9	11.8	8.5	10.4	7.1	14.1	12.9	9.0	10.8	18.7
7.00 - 7.20	19.4	15.9	19.5	14.0	6.8	11.0	18.2	13.4	10.8	11.7	6.2
7.20 - 7.40	19.8	19.9	22.6	14.5	11.5	19.1	21.4	18.2	17.0	12.3	8.3
7.40 - 7.60	6.6	16.1	16.2	23.8	21.8	23.0	15.8	20.4	16.5	17.9	2.0
7.60 - 7.80	5.6	8.4	11.0	24.5	14.8	9.1	11.4	12.7	17.3	18.8	0.0
7.80 +	11.3	6.5	8.1	12.1	25.2	21.5	9.2	20.7	23.8	22.4	0.0
SAMPLE SIZE	108	228	197	134	131	115	253	190	175	111	48
PERCENTILES											
5	6.61	6.60	6.59	6.87	6.75	6.66	6.70	6.85	6.76	6.64	6.16
25	6.93	6.93	7.01	7.20	7.17	7.13	7.04	7.16	7.18	7.12	6.44
50	7.16	7.21	7.26	7.47	7.51	7.40	7.27	7.41	7.46	7.51	6.61
75	7.38	7.45	7.52	7.67	7.82	7.69	7.52	7.73	7.79	7.78	6.88
95	8.05	7.84	7.89	8.16	8.20	8.16	7.92	8.20	8.25	8.36	7.30

Nutrition Canada

Table 6.7

NATIONAL SURVEY
CLASSIFICATION OF SERUM PROTEIN VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.0	0.0	0.1	0.6	0.9	0.0	0.4	0.0	0.3	0.0	0.8
	M[b]	1.9	6.9	2.2	0.1	1.4	6.8	1.0	1.3	4.6	12.6	8.2
	N[c]	172	433	496	375	412	263	488	475	498	259	255
URBAN	H	0.0	0.0	0.0	0.0	0.1	0.0	0.0	2.6	0.6	0.8	0.0
	M	0.3	5.4	1.2	2.8	4.2	5.9	4.0	4.5	1.7	1.3	10.2
	N	200	435	494	326	427	322	538	448	496	305	284
RURAL	H	0.0	0.4	0.0	3.0	0.1	0.3	0.6	0.2	1.5	2.1	0.0
	M	0.9	4.0	0.7	0.4	1.0	3.8	0.6	0.9	6.2	6.5	11.3
	N	161	355	404	303	369	309	449	410	498	244	195
SUMMER-FALL	H	0.0	0.0	0.0	0.7	0.0	0.0	0.4	0.1	0.8	0.1	0.0
	M	1.0	3.6	1.8	0.1	1.2	4.2	0.3	1.7	4.0	7.9	10.3
	N	273	593	650	450	565	468	716	614	711	404	341
WINTER-SPRING	H	0.0	0.3	0.1	1.4	0.9	0.2	0.4	1.3	0.5	1.4	0.5
	M	1.3	7.4	1.1	1.3	2.7	6.8	2.9	2.3	4.7	8.5	9.4
	N	260	630	744	554	643	426	759	719	781	404	393
TOTAL	H	0.0	0.1	0.0	1.1	0.4	0.1	0.4	0.7	0.7	0.8	0.3
	M	1.2	5.7	1.5	0.8	2.0	5.5	1.6	2.0	4.3	8.2	9.8
	N	533	1223	1394	1004	1208	894	1475	1333	1492	808	734

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 6.8

INDIAN SURVEY
CLASSIFICATION OF SERUM PROTEIN VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M [b]	0.0	0.0	0.7	0.5	0.0	1.3	0.0	0.0	0.5	2.3	0.0
	N [c]	44	106	116	74	71	61	134	97	95	56	15
REMOTE	H	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
	M	0.0	0.9	0.0	0.0	1.9	0.0	0.0	0.0	1.1	0.0	0.0
	N	64	122	81	60	60	54	119	93	80	55	33
ALGONKIAN	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.7	4.4	0.0
	N	34	62	44	32	37	18	57	57	40	20	14
IROQUOIAN	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	1.0	0.0	0.0	3.4	0.0	0.0	2.0	0.0	0.0
	N	11	30	36	16	18	19	38	23	31	14	3
PLAINS	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	30	61	35	25	40	42	63	35	55	30	18
PLATEAU	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	3.0	2.9	8.2	0.0	0.0	0.0	0.0	7.9	0.0
	N	15	30	35	29	15	13	44	31	24	17	8
PACIFIC	H	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	13	36	37	25	21	18	39	35	18	20	3
TOTAL [e]	H	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
	M	0.0	0.5	0.3	0.2	0.7	0.8	0.0	0.0	0.7	1.4	0.0
	N	108	228	197	134	131	115	253	190	175	111	48
NATIONAL SURVEY TOTAL	H	0.0	0.1	0.0	1.1	0.4	0.1	0.4	0.7	0.7	0.8	0.3
	M	1.2	5.7	1.5	0.8	2.0	5.5	1.6	2.0	4.3	8.2	9.8
	N	533	1223	1394	1004	1208	894	1475	1333	1492	808	734

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 6.9

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM ALBUMIN

G/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 2.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2.00 - 2.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.20 - 2.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.40 - 2.60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.60 - 2.80	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
2.80 - 3.00	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1
3.00 - 3.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	2.4
3.20 - 3.40	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.1	0.0	9.1
3.40 - 3.60	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.0	0.0	0.1	17.9
3.60 - 3.80	0.3	0.0	0.0	0.0	0.1	1.8	0.1	0.1	0.3	2.1	27.1
3.80 - 4.00	0.3	0.0	0.0	0.0	0.8	4.0	0.0	1.7	1.7	2.7	22.8
4.00 - 4.20	0.9	0.2	0.6	0.7	3.3	9.5	0.1	3.5	4.6	8.6	10.2
4.20 - 4.40	2.1	4.5	1.5	0.9	5.7	18.3	1.2	5.5	10.9	19.5	6.4
4.40 - 4.60	9.9	10.9	3.5	2.9	19.8	27.3	5.6	12.0	15.0	26.4	2.0
4.60 - 4.80	13.5	14.6	10.4	9.6	21.1	21.3	10.2	17.6	23.5	21.5	0.4
4.80 - 5.00	24.2	19.1	16.7	17.5	22.3	12.1	17.3	26.4	21.5	12.6	0.6
5.00 - 5.20	28.1	22.4	26.4	26.9	13.5	3.5	30.1	16.6	14.2	4.7	0.4
5.20 - 5.40	11.9	17.5	21.3	19.9	7.5	0.7	19.9	8.6	5.8	0.5	0.0
5.40 - 5.60	4.6	6.9	10.3	11.5	4.4	0.1	12.1	5.9	1.2	0.6	0.0
5.60 - 5.80	0.7	1.2	6.8	6.0	0.1	0.4	2.2	1.0	0.2	0.0	0.0
5.80 +	3.0	2.1	2.1	3.0	0.3	0.0	0.6	0.1	0.0	0.0	0.1
SAMPLE SIZE	537	1225	1395	1005	1209	895	1475	1333	1493	809	734
PERCENTILES											
5	4.40	4.40	4.50	4.50	4.20	3.90	4.50	4.10	4.00	3.90	3.20
25	4.70	4.70	4.90	4.90	4.50	4.30	4.80	4.60	4.50	4.30	3.50
50	4.90	5.00	5.10	5.10	4.70	4.50	5.00	4.80	4.70	4.50	3.70
75	5.10	5.20	5.30	5.30	5.00	4.70	5.20	5.00	4.90	4.70	3.90
95	5.50	5.40	5.70	5.70	5.30	4.90	5.50	5.40	5.20	5.00	4.30

Table 6.10

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM ALBUMIN

G/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 2.00	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2.00 - 2.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.20 - 2.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.40 - 2.60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
2.60 - 2.80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.0
2.80 - 3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.00 - 3.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	4.1
3.20 - 3.40	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	12.5
3.40 - 3.60	0.0	0.2	0.0	0.0	0.5	1.1	0.3	0.7	0.8	2.7	35.4
3.60 - 3.80	0.0	1.4	0.0	0.0	0.5	4.6	0.4	0.0	3.0	5.9	22.9
3.80 - 4.00	0.0	0.0	0.0	0.2	0.5	5.8	0.9	1.9	3.7	2.1	10.4
4.00 - 4.20	0.4	2.0	1.6	1.4	3.7	11.6	1.3	8.1	7.3	12.9	4.1
4.20 - 4.40	0.4	3.2	0.0	2.6	11.0	23.5	4.2	10.7	13.7	11.7	2.0
4.40 - 4.60	8.7	9.3	7.9	8.9	22.9	28.8	8.9	21.6	17.0	23.5	2.0
4.60 - 4.80	32.2	15.9	14.5	19.5	22.6	12.6	19.7	21.5	21.6	21.3	0.0
4.80 - 5.00	34.9	30.3	26.9	22.6	24.9	6.6	27.2	15.6	26.7	9.9	0.0
5.00 - 5.20	7.3	21.4	21.6	24.8	5.4	2.8	19.8	12.1	3.9	5.0	2.0
5.20 - 5.40	11.0	11.0	15.9	12.9	6.9	1.2	10.4	3.4	0.8	1.6	0.0
5.40 - 5.60	1.6	4.0	8.1	6.3	0.7	0.0	5.7	3.9	0.0	0.2	0.0
5.60 - 5.80	3.1	0.2	3.1	0.2	0.0	0.0	0.4	0.0	0.8	0.0	0.0
5.80 +	0.0	0.6	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0
SAMPLE SIZE	108	228	197	134	131	115	253	190	175	111	48
PERCENTILES											
5	4.50	4.20	4.50	4.40	4.10	3.70	4.20	4.00	3.80	3.50	3.10
25	4.60	4.70	4.80	4.70	4.40	4.20	4.70	4.40	4.30	4.10	3.40
50	4.80	4.80	4.90	4.90	4.60	4.40	4.80	4.60	4.60	4.40	3.50
75	4.90	5.00	5.20	5.10	4.80	4.50	5.10	4.80	4.80	4.70	3.70
95	5.30	5.30	5.50	5.40	5.20	4.90	5.40	5.30	5.00	5.10	4.20

Nutrition Canada

Table 7.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY THIAMIN

MG/1000 CAL.	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 0.20	0.2%	0.2%	0.2%	1.3%	1.6%	0.2%	2.1%	2.3%	0.2%	0.2%	0.1%
0.20 - 0.30	3.8	4.2	5.1	12.7	8.3	4.9	6.1	7.5	7.7	5.9	3.3
0.30 - 0.40	11.2	18.5	20.8	23.8	24.6	21.1	21.6	19.7	19.6	11.4	12.5
0.40 - 0.50	18.7	23.2	24.6	22.0	23.1	18.2	25.5	22.2	19.5	18.2	20.7
0.50 - 0.60	13.4	16.9	17.8	15.3	15.5	16.4	16.3	14.0	17.8	17.5	12.7
0.60 - 0.70	10.3	7.9	8.7	9.5	7.4	15.8	8.6	9.9	8.4	10.8	9.8
0.70 - 0.80	7.6	7.8	6.1	5.5	8.9	5.2	6.4	7.5	8.1	15.0	6.6
0.80 - 0.90	4.0	3.5	5.9	3.4	1.6	4.7	3.9	4.1	5.2	4.1	5.8
0.90 - 1.00	3.4	2.0	1.8	2.0	1.4	1.4	2.8	2.3	1.3	2.5	2.6
1.00 - 1.10	1.6	2.4	0.9	0.7	0.7	2.8	2.0	1.4	0.6	1.4	2.2
1.10 - 1.20	3.3	2.6	2.6	0.0	0.2	1.8	0.6	0.6	0.4	0.7	3.3
1.20 - 1.30	2.0	0.6	0.7	0.2	0.4	0.7	0.1	0.4	1.3	0.3	1.8
1.30 - 1.40	2.2	0.9	1.0	0.6	0.1	0.4	0.1	0.4	0.7	0.8	1.4
1.40 - 1.50	1.2	0.4	0.5	0.6	0.5	0.0	0.4	0.6	0.0	0.2	2.8
1.50 - 1.60	0.5	0.9	0.2	0.2	0.2	0.0	0.3	1.1	1.3	1.4	1.5
1.60 - 1.70	2.1	0.4	0.0	0.2	0.0	0.7	0.4	0.6	0.0	0.2	1.0
1.70 - 1.80	1.2	1.2	0.1	0.8	0.0	0.1	0.3	0.0	0.5	0.4	0.7
1.80 - 1.90	0.4	0.1	0.2	0.2	0.3	0.4	0.1	0.3	0.0	0.0	1.0
1.90 - 2.00	0.7	2.3	1.5	0.0	0.3	0.0	0.1	0.5	0.7	1.5	1.4
2.00 - 2.10	0.3	0.5	0.0	0.0	0.4	0.1	0.3	0.3	0.1	0.7	0.6
2.10 +	10.7	2.4	0.5	0.2	3.5	4.2	1.0	3.2	5.7	5.8	7.2
SAMPLE SIZE	1274	1351	1410	997	1222	879	1472	1340	1504	819	768
PERCENTILES											
5	0.30	0.30	0.29	0.25	0.25	0.29	0.27	0.26	0.26	0.29	0.31
25	0.44	0.40	0.39	0.34	0.36	0.39	0.38	0.38	0.38	0.43	0.44
50	0.62	0.52	0.49	0.45	0.46	0.52	0.47	0.48	0.50	0.57	0.60
75	1.12	0.74	0.66	0.59	0.61	0.68	0.63	0.69	0.71	0.77	1.03
95	2.78	1.91	1.21	0.97	1.51	1.71	1.06	1.61	2.22	2.53	2.40

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Table 7.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY THIAMIN

MG/1000 CAL.	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 0.20	0.0%	0.0%	1.2%	1.7%	4.0%	1.2%	0.4%	1.9%	1.6%	3.8%	0.0%
0.20 - 0.30	2.9	1.7	3.3	6.2	4.0	7.3	7.5	6.8	5.2	4.7	0.0
0.30 - 0.40	11.9	13.7	11.0	11.3	17.4	13.7	19.7	18.3	16.2	18.3	18.3
0.40 - 0.50	24.3	19.9	20.2	30.1	33.5	20.5	16.0	20.5	21.4	20.5	16.3
0.50 - 0.60	12.4	22.7	25.2	16.6	14.6	17.5	21.0	14.9	18.7	20.2	16.3
0.60 - 0.70	11.1	21.5	13.9	16.3	7.1	11.3	16.8	14.0	10.2	12.1	16.3
0.70 - 0.80	13.0	5.6	9.5	7.6	6.3	9.6	8.2	7.5	9.0	12.1	10.2
0.80 - 0.90	5.9	6.3	3.4	4.7	6.2	4.9	3.4	5.4	5.8	4.6	4.0
0.90 - 1.00	4.3	3.6	6.1	3.3	2.2	4.7	3.3	5.4	4.3	1.4	4.0
1.00 - 1.10	4.0	0.9	3.4	0.0	0.9	3.7	1.8	1.4	0.8	0.3	4.0
1.10 - 1.20	0.3	0.0	2.0	0.0	0.2	0.9	0.3	0.7	0.5	0.0	0.0
1.20 - 1.30	0.8	1.5	0.0	0.5	0.9	1.5	0.0	0.5	1.2	0.0	0.0
1.30 - 1.40	1.7	0.2	0.0	0.6	0.0	0.0	0.1	0.6	0.4	0.0	2.0
1.40 - 1.50	0.1	0.1	0.1	0.0	0.0	2.0	0.5	0.0	0.4	0.1	4.0
1.50 - 1.60	0.6	0.0	0.0	0.6	0.0	0.4	0.0	0.2	1.6	0.0	0.0
1.60 - 1.70	0.1	1.5	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	2.0
1.70 - 1.80	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.80 - 1.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.90 - 2.00	0.9	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
2.00 - 2.10	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.10 +	4.6	0.0	0.0	0.0	1.5	0.0	0.2	0.4	2.1	1.1	2.0
SAMPLE SIZE	196	240	203	138	131	113	270	195	178	113	49
PERCENTILES											
5	0.35	0.32	0.31	0.24	0.24	0.25	0.26	0.26	0.28	0.23	0.34
25	0.44	0.44	0.45	0.43	0.39	0.41	0.38	0.39	0.41	0.38	0.47
50	0.59	0.55	0.54	0.51	0.48	0.53	0.52	0.50	0.53	0.50	0.59
75	0.78	0.66	0.68	0.65	0.63	0.72	0.64	0.69	0.71	0.65	0.76
95	1.96	0.91	1.04	0.91	0.95	1.13	0.92	0.97	1.23	0.80	1.44

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Table 7.3

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY THIAMIN

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 0.20	0.5%	0.0%	0.1%	0.1%	0.9%	0.1%	0.3%	1.5%	1.6%	0.3%	0.0%
0.20 - 0.40	7.0	1.3	0.5	4.3	1.2	2.9	5.0	5.6	6.8	6.8	1.6
0.40 - 0.60	15.2	8.8	3.2	2.4	7.7	13.0	7.4	11.7	15.8	17.9	5.3
0.60 - 0.80	16.1	11.8	5.8	4.4	10.7	14.6	15.5	19.9	19.9	24.3	9.7
0.80 - 1.00	15.8	19.6	9.4	9.0	13.6	16.6	16.2	13.2	15.5	14.8	13.8
1.00 - 1.20	9.3	12.7	10.8	14.1	15.0	12.8	18.5	12.4	13.0	8.5	10.5
1.20 - 1.40	6.7	8.7	14.1	12.9	12.5	12.7	9.1	9.7	8.3	6.9	9.8
1.40 - 1.60	4.9	9.5	9.1	7.8	7.3	6.9	8.0	6.4	3.7	5.0	7.4
1.60 - 1.80	4.3	4.5	9.0	13.2	7.9	4.6	4.9	5.0	2.2	0.6	6.1
1.80 - 2.00	1.5	3.5	7.1	8.3	6.9	2.4	3.6	2.7	0.8	0.2	4.5
2.00 - 2.20	2.3	4.2	3.9	4.2	2.4	2.1	2.5	1.3	2.2	3.5	3.3
2.20 - 2.40	2.4	2.2	5.1	2.3	1.8	2.2	1.5	1.3	1.6	1.4	2.9
2.40 - 2.60	1.9	0.9	3.9	2.7	1.7	0.6	1.8	0.4	0.5	0.2	2.9
2.60 - 2.80	1.8	1.1	3.6	1.7	0.6	0.7	1.0	0.6	0.1	0.1	1.5
2.80 - 3.00	1.2	0.7	2.9	2.1	0.5	0.0	0.5	0.5	0.1	0.0	1.5
3.00 - 3.20	0.7	0.8	1.6	1.7	1.4	1.3	0.0	0.4	0.2	0.1	1.1
3.20 - 3.40	0.8	0.9	0.9	1.0	0.6	0.2	0.4	0.2	0.7	0.6	2.0
3.40 - 3.60	0.4	1.4	0.5	1.3	0.5	0.1	0.2	0.0	0.6	2.0	1.6
3.60 - 3.80	0.2	1.4	1.1	0.3	0.5	0.6	0.3	0.8	0.9	0.7	2.7
3.80 - 4.00	1.0	0.4	0.5	0.4	0.5	0.7	0.4	1.0	0.1	0.6	1.6
4.00 +	4.9	4.8	5.9	4.7	4.7	4.1	1.9	4.4	4.4	4.6	8.9
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	0.35	0.49	0.63	0.49	0.51	0.45	0.38	0.35	0.33	0.37	0.55
25	0.63	0.84	1.10	1.07	0.87	0.73	0.77	0.67	0.60	0.59	0.92
50	0.91	1.14	1.51	1.46	1.21	1.05	1.07	0.96	0.88	0.80	1.38
75	1.57	1.71	2.32	1.94	1.74	1.47	1.45	1.41	1.25	1.28	2.36
95	3.94	3.89	4.19	3.82	3.92	3.70	2.62	3.93	3.70	3.85	4.77

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Table 7.4

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY THIAMIN

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 0.20	1.7%	0.2%	0.8%	0.6%	1.8%	1.3%	1.5%	2.5%	1.3%	6.2%	0.0%
0.20 - 0.40	11.4	3.0	0.9	1.2	4.0	6.2	9.0	8.6	9.3	7.2	6.1
0.40 - 0.60	10.2	8.6	3.5	5.5	9.1	18.7	11.8	17.9	23.9	27.4	8.1
0.60 - 0.80	13.6	12.3	10.8	9.8	17.2	15.8	13.7	13.6	12.9	23.4	10.2
0.80 - 1.00	25.7	21.3	13.1	10.2	7.3	17.2	14.5	13.9	13.5	9.5	14.2
1.00 - 1.20	6.1	19.9	13.7	11.0	12.4	9.6	8.2	14.2	14.6	7.2	18.3
1.20 - 1.40	5.1	9.6	9.2	8.6	15.2	8.7	13.1	4.5	9.6	5.5	12.2
1.40 - 1.60	3.3	8.7	11.0	9.9	5.8	4.2	8.6	12.3	5.7	2.2	4.0
1.60 - 1.80	4.3	3.1	7.6	13.1	4.3	0.6	5.9	2.5	2.1	3.6	10.2
1.80 - 2.00	3.6	5.1	8.1	6.3	8.1	4.9	5.4	2.3	0.4	0.0	4.0
2.00 - 2.20	1.9	2.2	3.0	7.9	5.7	2.0	1.4	0.5	1.1	3.2	2.0
2.20 - 2.40	2.5	3.5	4.4	2.7	0.0	2.1	0.4	0.0	0.2	0.0	0.0
2.40 - 2.60	0.0	1.0	1.7	3.1	2.1	0.4	1.2	0.4	1.2	0.1	4.0
2.60 - 2.80	3.6	0.0	0.2	4.4	0.0	2.1	2.5	0.0	0.0	0.0	4.0
2.80 - 3.00	0.0	0.1	5.0	1.6	0.4	0.0	0.8	0.0	0.0	0.0	0.0
3.00 - 3.20	2.6	0.0	1.1	1.1	4.6	2.4	0.1	3.5	0.0	0.0	0.0
3.20 - 3.40	0.1	0.0	0.2	0.0	0.0	2.0	0.4	0.0	0.0	0.0	0.0
3.40 - 3.60	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.60 - 3.80	0.2	0.0	1.1	0.8	0.0	1.0	0.2	0.0	0.4	0.0	0.0
3.80 - 4.00	2.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.00 +	0.3	0.0	2.2	1.2	1.3	0.0	0.4	2.5	3.0	3.8	2.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	0.26	0.41	0.59	0.47	0.34	0.39	0.29	0.28	0.29	0.10	0.39
25	0.64	0.80	0.92	0.96	0.65	0.53	0.62	0.54	0.54	0.46	0.82
50	0.90	1.02	1.29	1.46	1.13	0.86	0.97	0.90	0.82	0.67	1.13
75	1.48	1.38	1.84	1.89	1.68	1.29	1.45	1.31	1.19	1.02	1.60
95	3.10	2.26	3.29	2.76	3.01	3.16	2.40	3.13	2.18	2.19	2.62

Nutrition Canada

Table 7.5

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF URINARY THIAMIN

MCG/G CREATININE	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 30	0.1%	0.0%	0.0%	0.0%	0.5%	0.0%	0.1%	0.0%	0.2%	0.3%	0.1%
30 - 40	0.0	0.0	0.0	0.5	0.4	0.5	0.3	0.0	0.2	0.2	0.0
40 - 50	0.0	0.0	0.0	0.3	0.6	2.0	0.2	0.3	0.4	0.3	0.1
50 - 60	0.0	0.0	0.0	1.0	2.0	3.3	1.4	1.1	0.7	1.7	0.1
60 - 70	0.0	0.0	0.3	1.4	3.5	1.8	1.8	0.8	1.3	1.1	0.6
70 - 85	0.0	0.0	1.0	4.1	5.4	6.1	1.5	4.1	3.7	2.4	0.6
85 - 100	0.0	0.0	0.9	6.1	6.4	7.9	2.4	4.8	2.7	5.4	0.3
100 - 120	0.0	0.3	3.2	6.4	12.3	8.1	3.6	7.8	8.2	4.4	1.4
120 - 140	0.3	0.1	2.7	8.9	9.0	5.3	6.8	6.7	7.2	2.0	1.7
140 - 160	0.1	0.7	3.9	10.5	9.7	6.8	5.6	8.2	7.5	4.3	2.3
160 - 180	0.1	0.7	3.7	8.0	4.0	10.9	5.9	4.1	5.7	7.6	4.9
180 - 200	1.1	0.5	4.9	5.0	5.0	3.1	4.1	9.6	8.0	6.6	3.7
200 - 300	4.7	6.9	18.1	23.8	17.9	12.7	24.1	21.9	23.3	25.2	23.0
300 - 400	5.6	8.3	18.6	8.7	9.0	7.9	15.6	13.1	7.5	8.6	14.7
400 - 600	10.4	23.6	18.0	8.5	8.1	7.0	12.8	7.0	7.8	8.6	15.0
600 - 800	13.1	17.4	11.7	2.9	1.3	2.0	6.4	4.2	6.0	5.4	9.4
800 - 1000	15.1	7.5	4.5	0.7	1.2	0.8	2.8	2.4	1.3	4.0	4.9
1000 - 1500	16.5	12.2	5.5	1.0	1.3	9.2	2.0	1.5	2.9	3.6	7.8
1500 - 2000	11.8	6.1	1.0	0.7	0.6	1.7	0.8	0.7	0.5	4.2	2.9
2000 - 2500	4.7	4.5	0.6	0.1	0.0	0.1	0.6	0.3	0.3	1.0	2.1
2500 +	15.6	10.4	0.4	0.1	0.9	1.8	0.2	0.5	3.8	2.2	3.4
SAMPLE SIZE	743	1285	1417	1000	1225	880	1393	1307	1468	789	751
PERCENTILES											
5	282.00	240.00	115.00	79.00	65.00	58.00	78.00	80.00	78.00	75.00	136.00
25	622.00	460.00	228.00	128.00	111.00	105.00	164.00	139.00	139.00	167.00	238.00
50	993.00	662.00	360.00	190.00	159.00	173.00	258.00	205.00	210.00	236.00	355.00
75	1792.00	1260.00	579.00	286.00	269.00	365.00	411.00	341.00	368.00	464.00	693.00
95	4376.00	3485.00	1254.00	640.00	691.00	1291.00	891.00	853.00	1347.00	1781.00	2134.00

Table 7.6

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF URINARY THIAMIN

MCG/G CREATININE	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 30	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30 - 40	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40 - 50	0.0	0.0	0.0	1.5	1.1	1.9	0.0	0.0	0.0	0.0	0.0
50 - 60	0.0	0.0	0.0	1.0	0.9	4.1	0.0	0.0	0.2	1.8	0.0
60 - 70	0.0	0.0	0.2	0.8	0.4	1.8	0.0	0.2	1.2	0.2	0.0
70 - 85	0.0	0.0	2.3	2.1	0.4	1.6	0.1	0.2	2.7	3.4	0.0
85 - 100	0.0	0.0	0.0	1.7	3.4	7.6	0.6	0.5	2.3	4.1	2.1
100 - 120	0.0	0.0	0.0	5.9	6.3	11.7	0.7	2.7	2.6	3.5	0.0
120 - 140	0.0	0.0	0.0	3.5	9.0	4.4	0.6	7.5	7.9	6.3	2.1
140 - 160	0.0	0.0	3.8	8.1	9.3	6.8	1.4	3.8	5.2	1.8	4.2
160 - 180	0.0	0.0	2.3	8.4	11.9	7.1	2.9	15.4	5.4	4.1	4.2
180 - 200	0.0	0.4	2.6	8.4	1.5	2.8	3.4	4.6	5.2	11.3	4.2
200 - 300	2.8	1.9	13.4	28.4	32.2	27.2	19.0	28.0	28.4	33.5	19.1
300 - 400	4.5	4.6	12.4	15.2	11.5	11.9	13.6	11.6	17.5	9.4	14.8
400 - 600	9.3	14.4	29.5	10.9	6.8	5.5	16.9	13.1	10.3	14.4	25.5
600 - 800	19.2	18.7	18.3	1.3	1.4	0.8	20.1	3.8	4.6	0.6	6.3
800 - 1000	10.6	14.0	7.9	0.0	0.5	0.0	8.7	4.3	1.1	0.3	4.2
1000 - 1500	39.6	15.0	3.9	0.0	1.8	3.3	6.1	2.5	2.2	4.1	12.7
1500 - 2000	6.2	9.2	0.8	0.0	0.4	0.0	1.7	0.5	0.9	0.4	0.0
2000 - 2500	1.5	6.4	1.0	0.0	0.0	0.0	0.1	0.5	0.2	0.0	0.0
2500 +	5.8	15.0	0.8	0.0	0.0	0.8	3.4	0.0	1.1	0.0	0.0
SAMPLE SIZE	122	224	191	132	126	115	250	186	174	103	47
PERCENTILES											
5	359.00	365.00	155.00	68.00	87.00	53.00	171.00	124.00	97.00	82.00	144.00
25	656.00	641.00	304.00	150.00	150.00	111.00	276.00	168.00	167.00	173.00	217.00
50	1036.00	947.00	468.00	228.00	212.00	198.00	454.00	244.00	251.00	229.00	375.00
75	1339.00	1714.00	685.00	301.00	288.00	268.00	735.00	396.00	388.00	345.00	560.00
95	2775.00	4437.00	1090.00	465.00	584.00	545.00	1564.00	870.00	839.00	774.00	1250.00

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Table 7.7

NATIONAL SURVEY
CLASSIFICATION OF URINARY THIAMIN VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.0	0.0	0.0	1.0	1.2	0.7	0.0	0.0	0.1	0.3	0.4
	M[b]	0.0	0.6	9.9	20.8	31.5	18.9	14.8	8.0	8.4	8.4	1.1
	N[c]	289	455	509	370	408	263	464	462	492	257	272
URBAN	H	0.0	0.1	0.3	0.0	0.1	0.4	0.0	0.0	0.4	0.9	0.0
	M	1.4	4.2	12.4	15.9	34.0	33.9	16.4	18.7	12.4	13.7	1.8
	N	236	451	492	333	444	311	515	444	498	294	281
RURAL	H	0.7	0.0	0.2	0.3	1.3	0.7	0.8	0.0	0.2	0.0	0.0
	M	0.0	1.5	8.9	26.0	27.3	39.8	19.0	12.2	9.6	15.3	3.5
	N	218	379	416	297	373	306	414	401	478	238	198
SUMMER-FALL	H	0.5	0.0	0.1	1.3	0.4	0.2	0.3	0.0	0.1	0.3	0.0
	M	0.7	2.1	10.2	23.7	30.1	32.8	17.1	8.7	7.4	9.3	2.3
	N	361	646	653	454	572	458	684	603	706	401	350
WINTER-SPRING	H	0.0	0.0	0.2	0.0	1.4	1.1	0.3	0.0	0.3	0.4	0.2
	M	0.0	1.4	10.0	18.7	31.7	27.0	15.8	14.2	11.9	13.8	1.7
	N	382	639	764	546	653	422	709	704	762	388	401
TOTAL	H	0.2	0.0	0.1	0.6	0.9	0.6	0.3	0.0	0.2	0.4	0.1
	M	0.3	1.8	10.1	21.0	30.9	29.8	16.5	11.5	9.7	11.6	2.0
	N	743	1285	1417	1000	1225	880	1393	1307	1468	789	751

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 7.8

INDIAN SURVEY
CLASSIFICATION OF URINARY THIAMIN VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
	M [b]	0.0	0.0	4.6	9.3	12.8	27.8	2.1	1.1	7.5	11.5	0.0
	N [c]	59	113	114	74	65	60	132	95	94	54	13
REMOTE	H	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	3.4	17.2	12.7	30.8	4.8	2.2	7.5	6.6	2.9
	N	63	111	77	58	61	55	118	91	80	49	34
ALGONKIAN	H	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	14.4	6.4	6.4	23.9	2.6	4.9	9.3	9.8	0.0
	N	34	60	41	34	35	18	58	54	39	17	11
IROQUOIAN	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	15.5	39.4	29.9	3.1	0.0	5.3	16.7	0.0
	N	12	33	34	15	16	19	35	23	31	13	3
PLAINS	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	16.8	7.1	26.5	3.6	0.0	2.4	4.2	5.0
	N	29	60	33	25	41	43	61	35	55	29	20
PLATEAU	H	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	8.5	8.0	22.8	1.8	0.0	16.4	10.0	0.0
	N	29	27	34	28	15	12	45	32	24	16	8
PACIFIC	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	4.8	20.2	21.5	60.4	6.9	2.1	18.6	20.9	0.0
	N	15	35	39	23	19	18	38	33	18	19	3
TOTAL [e]	H	0.0	0.0	0.0	2.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	4.0	13.3	12.8	29.0	3.4	1.7	7.5	9.7	2.1
	N	122	224	191	132	126	115	250	186	174	103	47
NATIONAL SURVEY TOTAL	H	0.2	0.0	0.1	0.6	0.9	0.6	0.3	0.0	0.2	0.4	0.1
	M	0.3	1.8	10.1	21.0	30.9	29.8	16.5	11.5	9.7	11.6	2.0
	N	743	1285	1417	1000	1225	880	1393	1307	1468	789	751

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 7.9

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY RIBOFLAVIN

MG/1000 CAL.	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 0.30	0.6%	1.1%	1.0%	2.1%	0.9%	2.5%	3.8%	3.2%	3.4%	2.7%	1.9%
0.30 - 0.45	1.5	4.2	10.7	9.2	11.6	10.5	9.5	10.2	14.3	11.7	5.0
0.45 - 0.60	5.9	7.9	13.5	23.8	20.8	15.6	16.3	22.8	17.5	17.8	9.8
0.60 - 0.75	8.2	12.2	15.0	25.2	25.2	15.3	18.1	15.2	15.5	11.6	13.8
0.75 - 0.90	8.4	12.9	15.5	16.9	11.7	18.5	15.2	13.8	16.6	11.9	10.2
0.90 - 1.05	11.7	13.3	9.4	7.6	11.0	12.5	8.6	11.9	6.8	14.3	10.4
1.05 - 1.20	5.7	12.7	9.5	5.3	6.0	4.1	9.6	4.4	4.9	6.0	8.8
1.20 - 1.35	6.5	7.5	8.5	2.4	2.8	4.2	5.0	4.0	5.2	2.2	5.9
1.35 - 1.50	7.2	5.4	3.4	2.0	1.4	3.7	4.0	1.7	1.9	2.8	5.3
1.50 - 1.65	6.3	3.1	4.2	0.5	0.9	1.8	1.6	2.6	0.6	0.4	2.9
1.65 - 1.80	5.7	3.4	1.5	0.5	0.4	1.0	1.5	0.6	0.6	5.1	4.5
1.80 - 1.95	4.2	3.2	1.1	0.1	0.4	3.1	0.8	1.1	1.8	1.1	3.3
1.95 - 2.10	3.2	2.0	0.6	0.4	0.5	1.0	0.7	0.1	1.2	1.6	1.5
2.10 - 2.25	2.0	1.5	0.2	0.0	0.2	0.5	0.7	1.5	0.7	0.9	3.1
2.25 - 2.40	2.3	1.5	1.1	0.0	0.7	1.3	0.5	0.0	0.5	0.4	1.0
2.40 - 2.55	2.3	0.6	1.4	0.0	0.4	0.3	0.3	0.8	0.6	0.9	2.9
2.55 - 2.70	1.7	1.1	1.3	0.5	1.3	0.3	0.3	1.1	0.6	0.1	2.2
2.70 - 2.85	0.8	1.9	0.1	1.2	0.2	0.3	0.4	0.2	0.9	0.4	1.3
2.85 - 3.00	3.0	0.5	0.3	0.1	0.7	0.1	0.5	0.0	0.4	0.1	0.3
3.00 - 3.15	1.1	0.0	0.0	0.0	0.0	0.0	0.2	0.3	1.2	0.3	0.7
3.15 +	10.8	2.9	0.8	1.3	2.0	2.3	1.2	3.4	3.8	6.9	4.0
SAMPLE SIZE	1272	1351	1410	997	1223	879	1470	1340	1501	817	768
PERCENTILES											
5	0.55	0.44	0.36	0.32	0.38	0.36	0.31	0.33	0.32	0.34	0.38
25	0.90	0.74	0.59	0.54	0.55	0.56	0.55	0.52	0.51	0.51	0.67
50	1.37	1.03	0.83	0.66	0.69	0.80	0.75	0.73	0.74	0.81	1.01
75	2.05	1.39	1.20	0.88	0.94	1.04	1.10	1.01	1.07	1.17	1.67
95	3.84	2.72	2.34	1.50	2.37	2.21	2.00	2.58	3.03	3.51	2.93

Table 7.10

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY RIBOFLAVIN

MG/1000 CAL.	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 0.30	4.0%	0.9%	1.3%	2.1%	3.7%	4.1%	6.2%	2.6%	4.5%	1.9%	0.0%
0.30 - 0.45	2.6	12.4	10.6	6.4	13.4	10.9	11.8	7.3	11.3	13.2	4.0
0.45 - 0.60	4.7	16.8	13.7	22.3	16.7	14.2	24.8	23.3	18.2	15.9	20.4
0.60 - 0.75	14.9	21.3	24.5	28.1	22.3	21.8	16.3	29.5	17.6	15.8	20.4
0.75 - 0.90	14.6	10.9	14.9	22.2	16.3	13.3	11.9	12.6	9.0	19.7	10.2
0.90 - 1.05	11.6	8.3	12.4	5.0	14.7	10.8	8.1	9.2	14.5	12.1	22.4
1.05 - 1.20	10.1	11.1	8.9	3.7	3.2	8.5	9.8	5.6	7.4	3.7	2.0
1.20 - 1.35	8.6	8.2	3.5	2.9	2.4	1.0	4.2	4.8	2.4	7.6	0.0
1.35 - 1.50	7.8	0.8	5.9	2.7	1.9	2.9	1.4	0.0	4.8	1.6	0.0
1.50 - 1.65	4.0	1.4	3.0	1.9	2.3	3.8	1.6	1.2	2.4	1.3	6.1
1.65 - 1.80	3.1	3.1	0.7	0.1	0.2	3.1	1.3	0.0	1.2	0.3	2.0
1.80 - 1.95	0.1	1.9	0.0	0.2	0.0	1.3	0.4	0.0	0.4	0.4	0.0
1.95 - 2.10	1.2	0.0	0.0	0.6	0.8	0.0	0.3	0.0	0.0	1.2	0.0
2.10 - 2.25	0.5	1.7	0.1	0.0	0.0	0.0	0.2	0.6	0.0	0.0	4.0
2.25 - 2.40	1.9	0.6	0.0	0.0	0.5	0.0	0.7	1.1	0.1	1.6	2.0
2.40 - 2.55	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.6	0.8	0.0	0.0
2.55 - 2.70	0.7	0.0	0.0	0.0	0.0	0.7	0.0	0.4	0.6	0.0	0.0
2.70 - 2.85	2.2	0.0	0.0	0.6	0.0	0.0	0.2	0.0	0.2	0.0	0.0
2.85 - 3.00	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	2.0
3.00 - 3.15	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
3.15 +	5.6	0.0	0.0	0.0	1.1	2.9	0.0	0.6	2.8	2.4	4.0
SAMPLE SIZE	196	240	203	138	131	111	268	194	179	113	49
PERCENTILES											
5	0.34	0.35	0.36	0.36	0.32	0.33	0.24	0.36	0.30	0.36	0.46
25	0.72	0.56	0.59	0.57	0.53	0.57	0.49	0.55	0.51	0.55	0.60
50	1.02	0.74	0.74	0.72	0.68	0.71	0.65	0.68	0.73	0.76	0.86
75	1.41	1.06	1.02	0.82	0.91	1.02	0.97	0.88	1.04	0.99	1.01
95	3.17	1.76	1.48	1.40	1.51	1.79	1.51	1.34	2.51	1.97	2.91

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Table 7.11

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY RIBOFLAVIN

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 0.5	1.3%	1.3%	1.1%	3.2%	1.5%	1.4%	3.1%	6.2%	7.9%	7.1%	0.9%
0.5 - 1.0	12.4	8.3	4.1	5.7	11.9	18.8	14.0	19.3	27.2	30.6	9.7
1.0 - 1.5	20.6	13.2	15.1	11.1	18.1	25.9	21.3	23.7	23.2	21.8	12.1
1.5 - 2.0	17.0	16.1	13.9	19.8	23.2	21.5	18.1	19.1	17.5	17.5	16.2
2.0 - 2.5	15.3	19.7	11.6	15.8	17.9	10.4	18.9	11.4	7.2	5.4	13.1
2.5 - 3.0	9.7	12.9	11.0	12.3	8.0	6.2	7.6	7.4	3.8	2.3	13.0
3.0 - 3.5	6.7	7.5	9.7	10.4	4.9	5.7	5.3	1.4	3.6	2.1	6.7
3.5 - 4.0	4.6	3.8	8.5	7.2	3.5	2.0	3.4	3.3	1.5	2.8	8.7
4.0 - 4.5	3.7	3.8	7.5	6.5	1.7	1.6	1.7	2.9	2.8	0.8	4.6
4.5 - 5.0	2.3	2.6	2.9	1.4	2.3	1.9	1.6	0.4	0.6	3.9	3.1
5.0 - 5.5	0.8	2.5	5.2	1.2	1.0	0.6	1.3	0.4	0.5	0.0	3.3
5.5 - 6.0	0.7	1.5	2.8	0.5	1.2	0.2	0.7	0.0	1.2	0.7	2.6
6.0 - 6.5	0.9	2.6	1.0	0.8	0.2	0.4	0.6	0.0	0.8	0.4	1.3
6.5 - 7.0	0.1	0.8	0.6	0.0	0.9	0.9	0.6	0.3	0.1	2.1	0.9
7.0 - 7.5	0.3	0.0	0.4	0.2	0.0	0.1	0.4	0.6	0.2	1.0	0.9
7.5 - 8.0	0.1	0.3	1.1	0.7	0.3	0.0	0.2	0.2	0.1	0.1	0.6
8.0 - 8.5	0.0	0.3	0.0	0.1	0.0	0.3	0.1	1.1	0.2	0.0	0.3
8.5 - 9.0	0.2	0.1	0.8	0.3	0.4	0.0	0.0	0.1	0.0	0.0	0.3
9.0 - 9.5	0.0	0.0	0.1	0.0	0.1	0.3	0.0	0.3	0.0	0.0	0.1
9.5 - 10.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1
10.0 +	2.3	1.7	1.6	1.9	1.9	0.7	0.1	0.5	0.7	0.5	0.6
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	0.70	0.80	0.90	0.70	0.70	0.60	0.50	0.40	0.30	0.40	0.70
25	1.30	1.50	1.60	1.70	1.30	1.10	1.10	0.90	0.80	0.70	1.50
50	1.90	2.20	2.60	2.20	1.80	1.50	1.70	1.50	1.30	1.20	2.40
75	2.90	3.10	3.90	3.30	2.60	2.20	2.40	2.30	1.90	1.80	3.60
95	5.40	6.30	6.50	5.40	5.80	4.70	4.70	4.30	4.40	5.80	6.10

Table 7.12

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY RIBOFLAVIN

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 0.5	7.7%	3.4%	2.2%	1.9%	6.5%	8.5%	11.7%	3.4%	11.0%	9.4%	4.0%
0.5 - 1.0	13.1	17.7	8.9	8.7	14.0	15.2	23.7	34.7	26.0	34.2	14.2
1.0 - 1.5	18.2	30.0	21.1	23.8	21.4	33.5	20.8	25.4	23.9	24.0	28.5
1.5 - 2.0	22.0	21.9	27.1	12.4	23.0	24.2	12.9	15.2	17.3	15.5	18.3
2.0 - 2.5	16.4	11.1	15.6	16.5	13.0	7.1	12.9	9.9	13.4	5.7	10.2
2.5 - 3.0	3.2	5.9	4.3	15.7	9.6	2.8	5.9	5.3	0.7	3.3	10.2
3.0 - 3.5	7.4	3.7	4.4	10.9	5.5	4.8	7.6	2.3	0.9	4.6	4.0
3.5 - 4.0	4.1	3.8	7.8	4.6	1.9	1.4	2.9	1.1	2.1	0.0	2.0
4.0 - 4.5	2.5	0.8	1.2	2.0	0.8	1.2	0.5	0.0	1.2	0.5	2.0
4.5 - 5.0	4.3	0.7	1.8	1.0	0.4	0.0	0.5	0.0	0.1	1.2	2.0
5.0 - 5.5	0.0	0.0	3.2	0.8	0.8	1.0	0.0	1.0	0.2	0.0	2.0
5.5 - 6.0	0.0	0.1	1.5	0.0	0.9	0.0	0.0	0.0	0.6	0.0	0.0
6.0 - 6.5	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0	0.4	1.1	0.0
6.5 - 7.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.0 - 7.5	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.5 - 8.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.7	0.6	0.0	0.0
8.0 - 8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
8.5 - 9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9.0 - 9.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
9.5 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.0 +	0.2	0.0	0.0	0.0	1.1	0.0	0.0	0.5	1.1	0.0	0.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	0.40	0.60	0.70	0.80	0.40	0.40	0.30	0.50	0.20	0.30	0.50
25	1.10	1.00	1.30	1.30	1.10	1.00	0.80	0.70	0.80	0.70	1.10
50	1.60	1.40	1.70	2.10	1.60	1.40	1.30	1.10	1.20	1.00	1.50
75	2.20	2.00	2.40	2.80	2.30	1.80	2.10	1.90	1.80	1.60	2.30
95	4.40	3.50	5.00	4.00	3.60	3.10	3.20	3.10	3.90	3.20	4.60

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Table 7.13

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF URINARY RIBOFLAVIN

MCG/G CREATININE	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%
30 - 40	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.1
40 - 50	0.0	0.1	0.0	0.8	0.0	0.7	0.3	0.1	0.2	0.1	0.2
50 - 75	0.0	0.1	0.6	1.2	1.5	2.6	1.6	1.2	2.0	3.5	1.7
75 - 100	0.1	0.0	0.4	1.6	3.9	3.6	1.4	3.9	2.2	1.5	1.9
100 - 125	0.0	0.2	0.5	1.3	1.9	3.6	3.7	1.4	3.4	3.9	1.4
125 - 150	0.3	0.1	0.6	2.3	2.8	3.5	1.6	4.7	3.0	2.7	2.3
150 - 200	0.9	0.6	3.4	8.3	7.1	8.0	5.1	6.7	9.1	5.4	4.2
200 - 250	0.4	0.4	2.9	9.8	8.7	5.5	5.0	8.1	6.3	6.1	5.7
250 - 300	0.5	0.9	5.6	6.5	10.0	5.3	4.3	6.8	6.2	3.4	3.0
300 - 500	4.7	6.5	20.3	28.7	22.3	15.4	20.8	25.5	19.7	22.7	15.5
500 - 750	8.2	12.4	16.5	20.8	18.1	21.3	20.2	16.0	14.5	17.7	12.5
750 - 1000	11.7	13.5	13.6	8.4	10.0	6.0	14.5	10.7	9.6	2.9	11.1
1000 - 1250	6.1	10.6	9.1	3.6	3.9	3.9	7.4	4.1	5.1	6.8	7.0
1250 - 1500	10.3	10.2	6.6	0.5	1.8	3.2	4.1	2.4	3.5	2.9	5.9
1500 - 2000	15.9	13.6	7.7	1.9	1.8	2.5	4.7	3.2	4.2	5.1	7.5
2000 - 2500	6.5	8.4	4.5	0.2	1.2	2.9	1.9	0.7	2.5	1.9	5.7
2500 - 3000	5.4	4.3	2.8	0.5	1.1	0.4	0.7	0.9	0.9	1.4	2.6
3000 - 4000	7.0	5.7	1.9	2.1	1.2	3.1	0.9	0.9	1.7	2.8	4.7
4000 - 5000	5.1	3.3	0.8	0.4	0.0	0.8	0.5	0.1	0.5	3.9	1.7
5000 +	16.2	8.1	1.2	0.0	1.7	6.7	0.4	1.5	4.4	4.0	4.1
SAMPLE SIZE	778	1298	1434	1005	1223	886	1420	1321	1475	800	751
PERCENTILES											
5	419.00	379.00	178.00	120.00	94.00	90.00	111.00	96.00	103.00	89.00	119.00
25	976.00	797.00	396.00	245.00	244.00	214.00	320.00	240.00	237.00	265.00	343.00
50	1647.00	1375.00	715.00	421.00	414.00	517.00	546.00	408.00	439.00	491.00	761.00
75	3398.00	2244.00	1252.00	639.00	694.00	939.00	944.00	744.00	925.00	1086.00	1606.00
95	9741.00	6108.00	2773.00	1584.00	2238.00	5372.00	1860.00	1920.00	3775.00	4410.00	4270.00

Nutrition Canada

Table 7.14

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF URINARY RIBOFLAVIN

MCG/G CREATININE	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 30	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30 - 40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40 - 50	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.0
50 - 75	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.2	0.6	0.0	4.3
75 - 100	0.0	0.0	0.0	2.7	1.4	0.8	0.6	0.1	2.2	0.6	2.1
100 - 125	0.0	0.0	0.9	3.7	4.2	7.2	1.0	2.5	0.1	1.5	2.1
125 - 150	0.0	0.0	0.7	2.4	1.4	3.7	1.0	5.7	4.0	0.4	2.1
150 - 200	4.0	0.3	3.5	8.5	17.8	8.2	4.1	7.2	9.1	3.8	6.5
200 - 250	0.0	1.0	7.3	7.6	6.6	4.8	5.4	7.9	6.9	8.2	6.5
250 - 300	0.0	1.6	4.5	6.2	4.9	7.0	5.3	9.8	4.5	4.8	4.3
300 - 500	11.1	17.7	18.6	24.5	25.8	32.0	23.4	20.5	23.5	27.2	19.5
500 - 750	18.8	14.2	27.3	23.7	19.2	22.8	19.2	22.1	18.2	16.6	17.3
750 - 1000	12.8	11.6	6.9	10.9	7.2	5.0	17.7	7.5	11.5	12.8	6.5
1000 - 1250	10.2	7.4	11.2	4.9	4.2	2.8	6.8	5.1	6.0	4.3	4.3
1250 - 1500	2.8	6.4	5.6	1.4	1.7	0.0	3.3	2.8	4.1	6.6	2.1
1500 - 2000	12.5	8.1	6.6	1.2	2.0	2.2	3.1	3.5	2.8	4.9	8.6
2000 - 2500	3.1	4.8	4.5	0.0	0.0	0.9	1.4	1.4	1.1	1.8	0.0
2500 - 3000	4.9	3.2	0.7	0.0	1.1	1.2	1.0	1.1	2.8	1.7	2.1
3000 - 4000	9.4	7.2	0.0	0.0	0.0	0.0	1.6	1.0	0.0	0.0	4.3
4000 - 5000	3.9	1.4	0.6	0.0	0.0	0.0	1.6	0.0	0.3	0.0	4.3
5000 +	6.0	14.3	0.2	0.7	0.4	0.8	2.6	0.6	1.5	4.1	2.1
SAMPLE SIZE	122	224	192	127	127	107	247	182	169	102	46
PERCENTILES											
5	369.00	360.00	196.00	102.00	116.00	119.00	177.00	132.00	134.00	195.00	95.00
25	556.00	569.00	372.00	239.00	188.00	253.00	410.00	251.00	259.00	321.00	262.00
50	1048.00	1106.00	661.00	472.00	399.00	370.00	570.00	427.00	477.00	521.00	536.00
75	2323.00	2678.00	1126.00	670.00	630.00	652.00	966.00	733.00	836.00	936.00	1076.00
95	6594.00	458.00	2204.00	1216.00	1252.00	1941.00	3054.00	1779.00	2333.00	2864.00	4300.00

Table 7.15

NATIONAL SURVEY
CLASSIFICATION OF URINARY RIBOFLAVIN VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.0	0.0	0.4	0.1	0.0	0.0	0.7	0.0	0.0	0.4	0.0
	M[b]	2.6	1.0	2.7	2.1	1.5	2.3	6.1	1.8	2.7	6.5	1.1
	N[c]	293	461	515	368	409	264	474	467	490	262	271
URBAN	H	1.3	0.1	0.1	0.0	0.0	0.1	0.6	0.2	0.0	0.9	0.0
	M	3.9	1.7	3.4	2.3	1.9	4.6	11.0	2.0	3.6	2.3	4.3
	N	253	454	500	337	442	314	526	447	503	300	282
RURAL	H	0.6	1.0	0.0	0.0	0.3	0.0	0.6	0.0	0.0	0.0	0.0
	M	4.0	1.6	5.5	2.2	2.7	4.0	8.9	3.8	3.0	1.7	3.5
	N	232	383	419	300	372	308	420	407	482	238	198
SUMMER-FALL	H	0.7	0.3	0.0	0.0	0.2	0.1	1.1	0.0	0.0	0.4	0.0
	M	2.3	2.0	2.8	3.0	2.5	4.3	6.4	1.2	2.2	6.2	2.6
	N	386	657	668	460	571	462	695	613	703	409	350
WINTER-SPRING	H	0.2	0.4	0.4	0.1	0.0	0.0	0.2	0.1	0.0	0.4	0.0
	M	4.5	0.7	4.8	1.4	1.5	2.6	9.7	3.3	3.7	2.2	3.2
	N	392	641	766	545	652	424	725	708	772	391	401
TOTAL	H	0.5	0.4	0.2	0.0	0.1	0.0	0.6	0.1	0.0	0.4	0.0
	M	3.4	1.4	3.8	2.2	2.0	3.5	8.0	2.3	3.0	4.2	2.9
	N	778	1298	1434	1005	1223	886	1420	1321	1475	800	751

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 7.16

INDIAN SURVEY
CLASSIFICATION OF URINARY RIBOFLAVIN VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M [b]	13.2	1.3	2.5	2.1	1.7	0.0	4.8	1.1	2.7	0.0	0.0
	N [c]	60	111	112	73	65	56	133	90	92	52	13
REMOTE	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
	M	9.7	1.0	3.2	0.0	1.2	0.0	5.4	0.0	0.0	0.0	3.0
	N	62	113	80	54	62	51	114	92	77	50	33
ALGONKIAN	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	4.3	0.0	1.7	0.0	0.0	0.0	2.6	0.0	1.3	0.0	0.0
	N	36	61	42	34	35	18	56	54	39	19	12
IROQUOIAN	H	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	2.4	9.0	6.8	8.3	0.0	7.1	2.3	2.2	0.0	0.0
	N	12	34	34	15	16	18	38	22	29	12	3
PLAINS	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	14.8	1.1	0.0	0.0	1.0	0.0	4.9	0.0	0.0	0.0	5.6
	N	29	57	32	23	41	38	61	31	53	29	18
PLATEAU	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5
	M	2.9	0.0	6.2	2.8	0.0	0.0	4.0	0.0	0.0	0.0	0.0
	N	27	27	35	28	15	11	42	33	24	15	8
PACIFIC	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	15.0	3.4	7.4	0.0	0.0	0.0	11.5	2.1	9.2	0.0	0.0
	N	15	36	39	21	20	17	39	33	18	19	3
TOTAL [e]	H	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
	M	11.3	1.2	2.9	1.0	1.5	0.0	5.1	0.5	1.8	0.0	2.2
	N	122	224	192	127	127	107	247	182	169	102	46
NATIONAL SURVEY TOTAL	H	0.5	0.4	0.2	0.0	0.1	0.0	0.6	0.1	0.0	0.4	0.0
	M	3.4	1.4	3.8	2.2	2.0	3.5	8.0	2.3	3.0	4.2	2.9
	N	778	1298	1434	1005	1223	886	1420	1321	1475	800	751

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 7.17

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY NIACIN

MG NIACIN EQUIV/1000 CAL	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 1.5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1.5 - 3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0 - 4.5	0.2	0.2	0.3	0.1	0.2	0.0	0.5	0.0	0.0	0.2	0.0
4.5 - 6.0	0.8	1.0	0.5	0.2	1.1	2.8	3.3	0.7	0.1	0.5	0.6
6.0 - 7.5	3.4	4.3	3.2	2.0	1.3	3.2	4.2	1.8	2.0	1.7	2.0
7.5 - 9.0	4.9	7.5	9.3	6.0	6.5	5.1	11.4	8.0	5.0	7.4	4.9
9.0 - 10.5	10.2	14.8	10.5	6.7	10.0	9.8	14.2	7.8	8.4	10.4	9.7
10.5 - 12.0	11.5	17.8	16.6	13.4	15.2	17.9	14.1	15.3	12.1	14.0	12.8
12.0 - 13.5	11.4	12.4	18.7	16.5	16.0	12.5	12.5	14.3	15.3	13.2	13.0
13.5 - 15.0	12.4	11.2	9.0	12.8	13.8	9.6	11.2	10.9	14.5	14.6	11.5
15.0 - 16.5	10.1	8.5	10.8	10.7	10.2	8.7	9.0	7.8	9.4	7.0	7.4
16.5 - 18.0	7.3	5.2	5.7	6.9	5.4	6.8	4.4	7.4	5.2	9.0	7.5
18.0 - 19.5	4.2	4.9	5.6	9.6	6.4	5.6	3.5	5.4	5.2	2.2	6.9
19.5 - 21.0	5.5	4.4	2.4	4.6	1.9	7.5	3.9	4.6	4.7	2.1	5.0
21.0 - 22.5	3.4	1.9	2.6	2.7	2.7	2.1	2.6	3.4	4.1	5.9	4.0
22.5 - 24.0	1.8	1.2	1.0	1.5	2.1	3.0	1.6	3.3	3.2	0.9	2.8
24.0 - 25.5	1.9	0.5	1.1	2.8	1.5	0.5	0.4	1.2	1.9	1.0	3.3
25.5 - 27.0	1.1	0.8	0.5	0.7	1.4	0.9	0.6	1.3	1.6	1.8	1.6
27.0 - 28.5	1.9	0.4	0.4	0.3	0.3	0.9	0.5	1.2	0.7	1.1	1.5
28.5 - 30.0	1.4	0.3	0.4	0.5	0.5	0.1	0.4	0.1	1.1	1.7	1.1
30.0 +	5.7	1.7	0.6	1.0	2.6	2.2	0.7	4.6	4.5	4.4	3.3
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	7.81	7.38	7.82	8.52	8.28	7.21	6.37	7.99	8.23	8.47	8.42
25	11.21	10.31	10.60	11.73	10.98	10.83	9.37	11.21	11.64	11.12	11.35
50	14.28	12.37	12.70	13.92	13.44	13.36	12.19	13.81	14.16	13.85	14.25
75	19.16	16.00	16.00	17.86	16.64	17.78	15.35	18.03	18.75	17.62	19.12
95	30.25	22.79	21.63	24.51	25.73	23.87	22.25	27.76	29.29	29.32	27.98

Nutrition Canada

Table 7.18

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY NIACIN

MG NIACIN EQUIV/1000 CAL	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 1.5	0.0%	0.2%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1.5 - 3.0	0.0	0.0	0.8	0.0	0.0	0.4	0.0	0.6	0.2	0.0	0.0
3.0 - 4.5	0.2	0.0	1.5	1.1	0.0	0.0	0.1	0.1	1.2	0.0	0.0
4.5 - 6.0	0.4	1.3	0.1	0.0	1.1	0.8	4.8	0.1	0.0	0.9	0.0
6.0 - 7.5	2.6	5.0	5.6	1.1	1.6	1.2	8.2	2.1	3.5	0.4	0.0
7.5 - 9.0	6.9	14.9	8.1	6.6	4.9	2.8	9.2	3.2	4.3	6.2	4.0
9.0 - 10.5	14.8	20.6	11.7	9.9	7.1	11.4	8.6	14.5	8.2	10.2	8.1
10.5 - 12.0	13.7	12.3	14.0	16.3	11.4	14.5	19.8	7.1	15.3	14.7	14.2
12.0 - 13.5	8.1	12.5	12.8	16.4	14.2	6.6	9.6	18.2	10.4	17.7	24.4
13.5 - 15.0	20.3	8.3	8.8	16.5	10.8	12.5	13.7	13.8	5.6	9.3	10.2
15.0 - 16.5	13.7	10.2	6.2	6.8	8.9	13.7	7.1	9.7	13.2	5.3	8.1
16.5 - 18.0	3.7	5.3	7.3	5.5	11.3	1.8	6.7	7.9	12.4	9.7	6.1
18.0 - 19.5	2.8	3.0	10.2	2.8	4.8	9.7	3.0	3.3	6.0	8.2	4.0
19.5 - 21.0	1.7	2.2	5.3	2.2	6.0	2.7	1.3	4.4	4.6	2.5	0.0
21.0 - 22.5	2.8	1.6	1.8	1.8	2.4	5.9	1.1	2.8	1.8	2.4	4.0
22.5 - 24.0	1.1	0.7	2.7	0.6	7.1	5.7	0.3	0.5	4.0	2.5	2.0
24.0 - 25.5	0.2	0.3	0.9	3.8	4.3	3.3	0.6	2.5	1.1	1.4	0.0
25.5 - 27.0	0.2	0.0	0.4	1.1	0.5	0.0	1.2	1.1	0.4	0.3	0.0
27.0 - 28.5	0.0	0.4	0.1	1.4	0.0	0.4	1.6	0.5	1.4	0.8	2.0
28.5 - 30.0	3.3	0.0	0.0	2.8	0.4	1.6	0.2	2.5	0.6	1.1	2.0
30.0 +	2.5	0.1	0.6	2.0	2.4	4.1	2.0	4.1	5.0	5.3	10.2
SAMPLE SIZE	196	241	203	138	131	113	270	195	179	113	49
PERCENTILES											
5	7.70	6.87	6.97	8.57	8.25	8.98	6.03	8.58	7.48	7.77	9.03
25	10.38	9.39	9.96	11.25	11.79	11.64	9.78	11.44	11.05	11.32	11.97
50	13.95	11.72	12.94	13.16	14.45	14.92	11.86	13.69	15.29	12.95	13.48
75	15.85	14.86	17.53	16.44	18.73	19.10	15.09	17.29	18.07	18.05	16.73
95	28.56	19.64	22.11	28.18	24.73	28.68	26.81	29.47	30.15	33.90	35.14

Nutrition Canada

Table 7.19

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY NIACIN

MG NIACIN EQUIV./DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 5	0.6%	0.0%	0.1%	1.1%	0.0%	0.0%	0.2%	0.1%	1.3%	0.2%	0.3%
5 - 10	8.6	1.8	0.5	0.3	1.0	2.1	4.2	2.0	4.0	5.7	0.7
10 - 15	20.0	8.0	2.3	0.1	4.8	8.9	6.4	12.1	9.8	20.2	5.4
15 - 20	22.8	16.1	4.8	4.0	7.0	18.3	16.5	11.9	17.8	23.0	8.8
20 - 25	11.7	15.4	11.0	6.7	10.9	19.5	19.0	20.0	18.7	16.0	14.0
25 - 30	13.4	19.1	12.0	9.1	13.7	8.9	15.2	13.2	18.9	11.3	15.7
30 - 35	8.7	11.8	11.4	8.7	12.5	12.4	12.9	11.0	8.4	8.0	11.1
35 - 40	4.6	8.7	11.8	10.5	12.8	11.1	7.9	8.6	6.9	8.7	12.3
40 - 45	2.5	5.8	9.5	7.6	7.6	5.6	7.2	4.9	3.6	2.7	10.9
45 - 50	1.7	3.2	8.8	11.4	8.3	3.5	3.1	3.1	3.2	1.4	5.2
50 - 55	1.4	2.7	6.1	6.9	4.9	5.3	2.1	3.1	4.0	1.4	4.4
55 - 60	0.4	2.7	2.7	6.1	3.2	1.5	2.1	2.0	0.6	0.3	2.9
60 - 65	0.2	0.8	3.4	6.4	2.3	0.5	0.7	4.1	0.3	0.1	1.9
65 - 70	0.0	1.6	4.4	2.7	2.8	0.3	0.4	1.1	0.7	0.0	1.6
70 - 75	0.4	0.7	2.5	1.9	2.2	0.0	0.3	0.5	0.3	0.0	0.6
75 - 80	0.2	0.3	1.6	3.1	0.9	0.1	0.2	0.5	0.0	0.0	1.3
80 - 85	0.0	0.1	1.4	3.7	1.7	0.0	0.2	0.2	0.2	0.0	0.6
85 - 90	0.0	0.4	0.6	1.1	0.2	0.5	0.0	0.1	0.0	0.0	0.1
90 - 95	0.0	0.0	1.5	0.2	0.8	0.0	0.1	0.0	0.1	0.0	0.0
95 - 100	0.0	0.1	0.3	1.6	0.0	0.1	0.1	0.0	0.0	0.0	0.2
100 +	2.0	0.0	2.3	5.9	1.5	0.4	0.0	0.4	0.4	0.3	0.9
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	8.20	12.20	17.30	17.50	14.50	11.30	10.20	11.70	9.60	9.20	14.40
25	14.40	19.40	27.60	32.70	25.10	19.20	19.30	19.30	17.40	14.60	23.40
50	19.60	27.10	38.30	45.50	34.90	25.50	25.60	26.20	24.10	20.10	31.90
75	28.90	36.30	51.70	62.00	48.30	38.10	35.00	36.90	32.90	28.10	42.80
95	49.40	56.80	84.40	104.90	75.90	53.00	54.70	63.60	53.10	41.80	67.80

Nutrition Canada

Table 7.20

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY NIACIN

MG NIACIN EQUIV./DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 5	2.0%	0.3%	0.8%	0.6%	1.0%	1.3%	2.2%	2.1%	2.8%	2.5%	0.0%
5 - 10	9.5	4.6	2.6	1.8	0.0	0.4	8.4	5.0	7.4	12.9	6.1
10 - 15	13.3	18.9	6.3	1.5	6.8	13.0	11.4	7.5	14.8	15.9	8.1
15 - 20	23.4	17.3	11.5	9.3	10.9	15.8	16.6	23.6	16.2	13.6	14.2
20 - 25	16.4	18.8	8.0	9.6	5.9	14.5	16.2	17.1	14.7	19.9	20.4
25 - 30	11.6	16.1	17.7	5.5	14.2	16.6	10.8	10.4	16.9	10.0	10.2
30 - 35	5.4	10.1	12.4	18.7	16.0	10.6	11.0	7.3	7.3	14.4	6.1
35 - 40	12.3	7.2	10.7	6.7	9.4	12.0	7.7	12.1	7.1	0.0	16.3
40 - 45	4.5	1.8	8.2	14.7	6.0	5.7	4.9	5.8	2.3	3.2	4.0
45 - 50	0.4	1.7	5.3	6.4	8.9	4.3	3.6	2.6	1.2	2.7	2.0
50 - 55	0.4	0.1	4.7	4.1	6.0	0.0	1.7	0.6	4.6	0.1	2.0
55 - 60	0.0	1.8	1.0	5.0	3.4	1.3	0.4	1.0	0.8	0.3	2.0
60 - 65	0.0	0.5	2.0	2.8	2.3	1.4	2.3	0.9	0.2	3.3	2.0
65 - 70	0.0	0.2	4.1	3.8	1.9	0.5	0.6	0.0	0.7	0.0	0.0
70 - 75	0.0	0.1	1.3	1.5	2.8	0.0	0.7	0.0	0.8	0.5	4.0
75 - 80	0.2	0.0	1.7	0.2	0.4	1.5	0.0	0.0	0.2	0.0	0.0
80 - 85	0.0	0.0	0.0	1.7	0.0	0.0	0.0	2.2	0.0	0.0	0.0
85 - 90	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	2.0
90 - 95	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
95 - 100	0.0	0.0	0.0	1.6	0.5	0.4	0.0	0.0	0.0	0.0	0.0
100 +	0.0	0.0	0.8	3.5	3.0	0.0	0.0	1.2	1.1	0.0	0.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	5.70	10.00	11.90	15.30	12.40	11.10	7.10	7.60	8.60	6.00	9.60
25	15.00	15.00	22.50	26.30	25.10	18.40	15.50	17.40	14.90	13.20	18.90
50	20.20	20.90	32.50	36.50	34.30	25.90	23.30	24.70	23.20	20.30	26.40
75	27.90	29.70	42.00	49.80	48.20	36.80	34.40	35.40	30.60	29.90	38.00
95	41.10	42.20	67.30	96.40	70.50	55.30	55.70	57.20	53.10	48.60	73.80

Nutrition Canada

Table 8.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY VITAMIN C

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 20	9.8%	8.4%	6.5%	6.9%	7.5%	10.3%	11.6%	12.2%	11.2%	6.9%	3.9%
20 - 40	15.3	11.8	14.6	13.0	15.1	14.8	15.4	16.8	13.0	11.9	8.2
40 - 60	13.8	12.4	15.2	11.8	12.4	21.3	15.1	12.8	14.5	18.3	8.0
60 - 80	10.1	14.6	12.1	10.5	13.4	10.6	12.2	13.1	10.8	16.0	8.2
80 - 100	10.5	12.0	10.4	8.8	12.5	8.1	10.9	8.0	9.6	12.8	6.7
100 - 120	10.4	10.6	8.9	7.5	7.0	10.0	7.3	8.5	8.9	7.6	8.9
120 - 140	6.8	5.7	5.8	9.1	5.4	6.6	6.4	7.2	6.7	4.5	8.4
140 - 160	5.4	3.3	5.6	7.9	5.4	5.0	6.0	5.0	4.3	5.8	8.4
160 - 180	3.4	3.9	4.5	5.0	3.7	2.1	3.1	3.8	3.4	3.9	5.5
180 - 200	3.2	3.2	4.1	2.9	2.1	1.4	1.7	1.8	2.7	3.0	4.6
200 - 220	2.3	1.9	1.8	3.5	1.8	2.9	1.4	2.0	2.2	3.1	5.3
220 - 240	1.0	1.8	1.6	1.3	3.4	1.7	1.1	1.1	2.2	0.6	4.6
240 - 260	0.8	3.5	2.9	2.1	0.8	0.6	1.3	1.1	2.8	0.6	2.6
260 - 280	1.5	1.5	1.0	0.6	1.8	0.2	0.7	1.0	2.3	0.5	2.8
280 - 300	0.4	1.1	0.8	1.0	0.7	0.0	2.0	2.0	0.8	0.4	2.8
300 - 320	1.0	0.2	0.2	1.4	1.4	0.5	0.3	0.4	0.7	0.4	2.2
320 - 340	0.5	0.6	1.0	1.2	1.0	0.0	1.1	0.0	0.5	0.6	1.6
340 - 360	0.6	0.6	0.3	0.7	0.0	0.8	0.6	0.3	0.2	0.1	1.8
360 - 380	0.3	0.3	0.0	1.2	0.4	0.0	0.1	0.0	0.1	0.0	0.3
380 - 400	0.4	0.4	0.4	0.1	0.0	0.0	0.1	0.6	0.1	0.3	0.7
400 +	1.5	1.2	1.3	2.5	2.9	2.2	0.5	1.2	1.9	1.8	3.3
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	11.00	15.00	18.00	13.00	11.00	10.00	9.00	8.00	8.00	16.00	22.00
25	39.00	49.00	45.00	45.00	44.00	39.00	37.00	34.00	40.00	49.00	71.00
50	81.00	85.00	80.00	94.00	81.00	67.00	69.00	70.00	81.00	79.00	133.00
75	134.00	136.00	142.00	156.00	145.00	119.00	125.00	124.00	139.00	127.00	214.00
95	284.00	275.00	270.00	324.00	316.00	237.00	281.00	277.00	271.00	242.00	356.00

Nutrition Canada

Table 8.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY VITAMIN C

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 20	16.1%	17.1%	19.9%	17.5%	27.0%	27.4%	20.3%	22.6%	20.7%	21.6%	14.2%
20 - 40	17.4	28.9	19.3	15.1	11.8	23.5	22.5	23.9	21.8	25.3	12.2
40 - 60	12.5	13.2	14.7	25.3	13.9	19.6	9.0	11.6	15.8	28.1	18.3
60 - 80	13.1	10.4	12.2	8.1	17.2	10.6	8.1	12.3	12.8	6.2	12.2
80 - 100	11.3	7.4	6.4	7.4	7.1	6.8	9.2	8.6	8.7	3.2	8.1
100 - 120	3.6	4.6	4.0	2.5	5.6	2.6	7.3	5.7	3.9	3.5	10.2
120 - 140	7.3	1.1	8.0	7.5	5.2	3.9	5.1	2.4	4.8	7.3	10.2
140 - 160	4.3	4.8	5.4	2.4	1.5	3.2	4.1	6.3	4.4	3.3	2.0
160 - 180	4.2	2.5	3.1	5.3	2.4	0.0	3.9	2.2	2.2	0.5	6.1
180 - 200	1.7	3.4	2.4	1.6	2.3	0.0	2.0	1.0	1.5	0.0	0.0
200 - 220	1.0	1.7	0.4	2.0	0.5	0.0	0.9	0.7	0.2	0.0	2.0
220 - 240	1.9	0.8	0.8	0.2	1.6	1.2	2.0	0.0	0.8	0.0	2.0
240 - 260	0.0	1.8	0.6	0.0	0.4	0.0	1.1	0.4	0.0	0.0	0.0
260 - 280	0.0	0.4	0.0	1.0	0.0	0.7	0.1	0.8	0.0	0.0	0.0
280 - 300	0.3	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0
300 - 320	4.2	0.2	0.1	0.0	0.0	0.0	0.0	0.7	0.0	0.4	2.0
320 - 340	0.0	0.7	0.5	1.3	0.4	0.0	0.4	0.0	0.0	0.0	0.0
340 - 360	0.2	0.0	0.9	0.1	0.0	0.0	0.6	0.0	0.0	0.0	0.0
360 - 380	0.0	0.0	0.0	0.8	0.0	0.0	1.1	0.0	0.0	0.0	0.0
380 - 400	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400 +	0.1	0.2	0.2	1.2	0.4	0.0	1.1	0.0	1.7	0.0	0.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	12.00	5.00	9.00	7.00	0.00	0.00	6.00	1.00	3.00	4.00	10.00
25	27.00	24.00	27.00	33.00	17.00	18.00	22.00	20.00	22.00	23.00	39.00
50	65.00	44.00	49.00	48.00	54.00	39.00	57.00	46.00	46.00	42.00	62.00
75	129.00	90.00	116.00	108.00	87.00	66.00	116.00	92.00	93.00	59.00	119.00
95	292.00	218.00	180.00	218.00	200.00	154.00	236.00	163.00	179.00	133.00	215.00

Nutrition Canada

Table 8.3

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM VITAMIN C

MG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 0.10	1.1%	1.0%	1.6%	1.4%	1.8%	1.5%	1.3%	1.7%	1.4%	1.0%	0.8%
0.10 - 0.20	1.8	1.1	2.0	5.3	6.6	14.0	2.3	4.7	2.3	3.3	1.3
0.20 - 0.30	3.0	4.5	3.4	9.0	10.6	8.0	4.6	6.7	6.1	6.2	3.1
0.30 - 0.40	3.6	2.6	6.2	8.9	9.6	9.0	5.1	10.4	6.7	4.3	3.3
0.40 - 0.50	3.6	3.6	9.8	6.9	7.6	7.7	5.1	6.5	6.4	8.0	4.2
0.50 - 0.60	6.0	3.4	5.9	4.5	7.1	5.9	7.5	5.8	5.1	2.7	4.7
0.60 - 0.70	3.7	6.0	7.4	7.1	10.1	6.0	7.1	8.4	5.1	6.7	6.7
0.70 - 0.80	4.5	5.2	7.2	7.1	7.8	7.0	6.6	6.2	5.9	4.4	6.3
0.80 - 0.90	7.1	4.3	5.2	10.1	6.2	7.3	5.8	6.6	5.6	4.4	9.7
0.90 - 1.00	5.8	4.3	6.7	9.8	7.7	7.3	8.2	5.8	6.5	9.8	7.8
1.00 - 1.10	2.7	5.4	8.7	6.2	3.7	5.9	7.2	7.5	8.9	12.7	10.8
1.10 - 1.20	5.6	9.3	6.1	6.8	2.9	5.2	9.8	9.7	8.5	4.1	10.7
1.20 - 1.30	5.8	10.6	7.0	5.7	4.2	2.0	8.4	6.4	7.9	8.6	8.0
1.30 - 1.40	7.1	4.4	6.0	4.5	6.7	1.6	5.9	4.1	4.7	4.7	7.7
1.40 - 1.50	10.5	9.5	4.0	1.9	2.2	5.7	6.0	4.2	5.1	4.1	5.6
1.50 - 1.60	6.0	8.8	2.8	2.1	1.9	1.1	2.8	2.4	3.0	4.0	2.9
1.60 - 1.70	7.1	2.7	4.8	0.3	1.1	1.0	1.8	1.3	4.2	2.0	1.7
1.70 - 1.80	6.1	2.9	2.0	1.3	0.2	0.2	0.8	0.1	1.7	5.0	1.3
1.80 - 1.90	2.4	2.8	1.1	0.0	0.3	0.6	0.7	0.1	1.8	0.8	0.9
1.90 - 2.00	2.1	2.0	0.2	0.1	0.6	0.1	1.1	0.3	0.3	1.0	0.6
2.00 +	3.4	4.6	0.9	0.1	0.2	1.7	1.0	0.3	1.8	1.3	0.8
SAMPLE SIZE	483	1166	1360	973	1167	865	1421	1295	1438	780	737
PERCENTILES											
5	0.26	0.27	0.24	0.16	0.15	0.13	0.22	0.17	0.23	0.21	0.28
25	0.75	0.75	0.53	0.40	0.35	0.31	0.59	0.42	0.52	0.56	0.71
50	1.20	1.18	0.90	0.78	0.64	0.64	0.95	0.78	0.99	0.98	1.01
75	1.53	1.49	1.28	1.08	0.99	1.02	1.24	1.12	1.26	1.28	1.26
95	1.94	1.98	1.68	1.48	1.46	1.43	1.62	1.47	1.72	1.77	1.63

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Table 8.4

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM VITAMIN C

MG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 0.10	1.8%	1.6%	1.8%	4.3%	2.8%	5.5%	1.1%	5.1%	3.4%	5.1%	4.0%
0.10 - 0.20	1.3	0.0	4.0	9.2	24.8	35.1	4.5	8.1	8.0	16.0	8.0
0.20 - 0.30	2.6	0.4	8.4	19.5	19.7	18.7	4.6	13.0	17.9	14.3	6.0
0.30 - 0.40	3.1	2.7	8.0	17.1	11.9	9.6	8.0	11.0	12.0	10.6	16.0
0.40 - 0.50	6.4	7.4	3.9	10.9	13.0	9.4	3.6	13.5	7.7	6.8	6.0
0.50 - 0.60	9.0	2.2	3.0	6.6	7.4	3.5	9.0	6.8	11.6	12.0	6.0
0.60 - 0.70	4.6	5.5	7.8	7.8	5.5	7.2	5.5	5.1	7.7	7.4	2.0
0.70 - 0.80	3.0	7.4	8.5	7.8	1.7	4.1	2.1	4.4	7.0	4.3	6.0
0.80 - 0.90	10.0	2.4	5.8	4.4	3.7	1.1	5.2	8.9	3.8	5.6	4.0
0.90 - 1.00	6.8	7.5	3.7	4.2	0.9	2.8	8.9	4.7	2.3	7.2	8.0
1.00 - 1.10	9.0	10.1	5.7	1.2	3.7	0.0	6.6	6.7	5.1	0.9	12.0
1.10 - 1.20	17.3	12.0	5.7	2.3	2.9	0.7	12.0	5.3	4.1	2.2	8.0
1.20 - 1.30	8.0	10.5	9.7	1.3	0.3	0.0	4.4	2.0	2.3	1.5	8.0
1.30 - 1.40	4.1	6.9	6.2	0.6	0.0	0.0	4.7	0.2	0.9	0.9	2.0
1.40 - 1.50	0.7	3.9	9.6	0.9	0.0	0.8	8.1	1.5	0.6	1.2	0.0
1.50 - 1.60	1.8	9.0	4.2	0.7	0.0	0.0	4.6	1.4	2.3	0.6	2.0
1.60 - 1.70	0.6	4.3	0.7	0.2	0.0	0.7	2.6	1.3	1.5	1.5	0.0
1.70 - 1.80	1.6	2.7	1.1	0.0	1.0	0.0	2.2	0.0	0.8	0.0	0.0
1.80 - 1.90	2.9	0.7	0.4	0.1	0.0	0.0	1.1	0.2	0.0	0.9	2.0
1.90 - 2.00	4.2	0.1	0.4	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
2.00 +	0.1	1.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SAMPLE SIZE	97	213	190	132	123	113	241	185	157	106	50
PERCENTILES											
5	0.24	0.40	0.17	0.11	0.12	0.09	0.18	0.09	0.12	0.09	0.10
25	0.60	0.78	0.43	0.24	0.19	0.15	0.54	0.27	0.26	0.21	0.37
50	1.00	1.11	0.86	0.39	0.32	0.24	0.98	0.48	0.50	0.41	0.70
75	1.18	1.36	1.28	0.68	0.53	0.47	1.24	0.88	0.77	0.76	1.06
95	1.80	1.71	1.55	1.12	1.05	0.91	1.63	1.28	1.44	1.37	1.36

Table 8.5

NATIONAL SURVEY
CLASSIFICATION OF SERUM VITAMIN C VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.7	1.8	3.8	6.7	6.4	23.6	3.6	8.1	4.8	2.3	2.3
	M[b]	17.2	11.2	23.9	14.9	20.9	10.1	18.2	14.3	12.5	4.9	6.8
	N[c]	158	410	485	363	396	257	472	452	473	251	264
URBAN	H	7.5	2.8	4.0	8.9	10.8	9.0	3.7	2.3	2.5	5.8	1.5
	M	21.7	22.6	20.7	20.3	19.3	25.1	27.6	26.4	12.3	21.0	8.0
	N	171	408	470	311	410	305	512	428	477	295	274
RURAL	H	2.3	2.2	3.5	5.1	9.9	10.6	3.7	6.9	3.0	7.0	3.0
	M	14.4	14.8	33.1	24.1	23.9	21.4	28.1	16.2	17.3	15.4	8.0
	N	154	348	405	299	361	303	437	415	488	234	199
SUMMER-FALL	H	4.8	1.5	4.5	7.8	8.7	19.7	3.0	6.2	2.7	4.9	2.0
	M	17.0	10.7	21.2	16.3	17.5	18.9	18.8	9.1	10.9	6.4	7.4
	N	263	587	653	445	566	463	698	614	712	405	351
WINTER-SPRING	H	1.6	2.8	2.8	5.9	8.2	11.5	4.3	6.7	5.1	3.9	2.3
	M	17.8	18.7	31.8	20.3	25.9	16.2	28.3	26.1	16.9	16.4	7.8
	N	220	579	707	528	601	402	723	681	726	375	386
TOTAL	H	3.0	2.2	3.7	6.8	8.5	15.6	3.6	6.5	3.8	4.4	2.2
	M	17.5	14.9	26.2	18.4	21.4	17.6	23.3	17.6	13.7	11.4	7.6
	N	483	1166	1360	973	1167	865	1421	1295	1438	780	737

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 8.6

INDIAN SURVEY
CLASSIFICATION OF SERUM VITAMIN C VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	2.0	0.6	1.5	6.9	22.8	30.4	0.9	4.9	3.4	9.7	0.0
	M [b]	12.0	5.7	13.4	30.4	32.8	28.8	25.8	26.5	29.4	26.2	40.0
	N [c]	39	104	118	77	68	61	134	99	92	56	15
REMOTE	H	4.1	2.4	10.9	20.4	35.4	56.2	11.4	21.4	26.8	39.9	17.1
	M	30.5	18.7	34.9	45.2	30.2	27.9	25.5	28.1	35.8	27.0	25.7
	N	58	109	72	55	55	52	107	86	65	50	35
ALGONKIAN	H	6.1	0.0	10.1	2.6	17.2	34.9	5.1	17.1	7.5	2.9	7.1
	M	18.4	23.9	16.9	36.9	26.4	14.4	28.1	30.5	13.5	47.5	42.9
	N	28	52	36	29	28	16	45	48	26	15	14
IROQUOIAN	H	6.5	3.7	0.0	2.0	16.1	22.2	0.7	0.0	4.0	13.2	0.0
	M	42.0	1.9	22.1	36.5	48.1	43.1	38.2	17.9	33.9	5.0	33.3
	N	11	30	37	17	18	19	38	25	32	14	3
PLAINS	H	2.7	1.5	8.9	22.4	43.7	53.1	8.8	22.4	16.0	34.5	20.0
	M	22.4	11.8	30.9	43.6	26.2	25.2	26.4	27.6	34.2	26.4	20.0
	N	31	61	35	25	41	42	65	36	55	31	20
PLATEAU	H	0.0	4.4	0.0	25.6	9.6	42.0	2.2	8.8	15.0	24.8	12.5
	M	28.8	28.5	21.5	27.3	40.4	17.5	21.1	19.8	42.2	29.7	25.0
	N	13	26	35	29	15	13	42	32	22	17	8
PACIFIC	H	0.0	2.5	0.0	0.0	5.8	35.4	3.4	0.0	7.1	9.2	0.0
	M	16.0	4.2	16.0	33.3	37.2	35.8	16.5	37.0	40.8	27.8	33.3
	N	10	36	37	26	21	18	39	36	16	20	3
TOTAL [e]	H	3.2	1.6	5.9	13.7	27.7	40.7	5.7	13.3	11.5	21.2	12.0
	M	22.5	12.9	23.5	37.8	31.7	28.4	25.7	27.3	31.7	26.5	30.0
	N	97	213	190	132	123	113	241	185	157	106	50
NATIONAL SURVEY TOTAL	H	3.0	2.2	3.7	6.8	8.5	15.6	3.6	6.5	3.8	4.4	2.2
	M	17.5	14.9	26.2	18.4	21.4	17.6	23.3	17.6	13.7	11.4	7.6
	N	483	1166	1360	973	1167	865	1421	1295	1438	780	737

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

TABLE 8.7

INDIAN SURVEY
MEDIAN INTAKES OF VITAMIN C
ACCORDING TO GEOGRAPHIC LOCALITY

	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
CLOSE TO URBAN CENTRE mg/day	80	63	76	62	60	43	82	56	62	44	89
CLOSE TO URBAN CENTRE N [a]	94	119	121	77	70	59	146	98	96	56	15
REMOTE mg/day	52	34	37	41	43	27	39	35	27	34	52
REMOTE N	102	122	82	61	62	54	124	97	83	57	34

[a] Number in sample.

Table 9.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY VITAMIN A

MCG RETINOL EQUIV./DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 250	4.3%	2.6%	2.7%	6.0%	4.1%	6.0%	6.3%	5.9%	6.9%	8.2%	2.2%
250 - 500	16.1	16.1	8.0	8.0	10.2	16.5	20.0	18.5	22.9	24.2	6.7
500 - 750	15.1	22.4	18.5	12.9	15.0	22.2	21.4	22.6	25.0	21.5	13.8
750 - 1000	14.7	15.9	17.3	13.9	16.5	15.3	12.9	15.2	16.8	13.8	13.4
1000 - 1250	13.4	12.6	13.8	15.8	12.6	9.9	10.3	13.9	9.4	6.0	10.0
1250 - 1500	7.4	6.5	9.6	14.1	11.8	8.6	9.6	4.9	4.4	8.4	8.4
1500 - 1750	6.8	4.3	7.4	8.8	6.8	6.8	3.2	3.1	2.6	2.4	7.8
1750 - 2000	6.5	3.5	5.0	4.7	5.8	3.6	3.5	2.3	4.0	4.1	7.4
2000 - 2250	4.7	4.0	4.4	3.7	4.9	1.3	1.2	1.9	2.0	2.1	6.6
2250 - 2500	2.6	1.8	2.0	1.5	2.8	1.6	4.2	4.1	0.8	2.5	6.2
2500 - 2750	1.5	2.0	3.0	2.7	2.4	0.3	1.6	0.9	0.6	1.1	3.9
2750 - 3000	0.5	1.4	1.8	0.9	1.9	1.0	1.0	0.6	0.5	0.7	3.3
3000 - 3250	0.4	1.6	1.0	1.2	0.5	0.3	0.6	0.2	0.1	0.4	1.0
3250 - 3500	0.5	0.9	0.6	0.6	0.2	0.6	0.6	1.2	0.4	0.5	1.0
3500 - 3750	0.0	1.5	0.2	0.2	0.9	1.5	0.2	0.3	0.3	0.3	0.9
3750 - 4000	0.3	0.4	1.5	0.2	0.2	0.5	0.0	0.0	0.6	0.4	0.7
4000 - 4250	0.0	0.1	0.1	0.2	0.4	0.9	0.2	0.0	0.0	0.0	0.2
4250 - 4500	0.1	0.1	0.7	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3
4500 - 4750	0.7	0.1	0.0	0.0	0.1	0.2	0.0	0.2	0.2	0.0	0.6
4750 - 5000	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.1	0.6	0.6
5000 +	3.5	1.3	1.4	3.6	1.9	1.7	1.8	3.2	1.3	1.9	4.1
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	265.00	293.00	335.00	236.00	261.00	217.00	244.00	239.00	218.00	228.00	370.00
25	564.00	570.00	676.00	692.00	659.00	532.00	482.00	507.00	454.00	441.00	791.00
50	990.00	904.00	1050.00	1123.00	1061.00	823.00	775.00	793.00	688.00	708.00	1391.00
75	1653.00	1429.00	1664.00	1584.00	1669.00	1381.00	1327.00	1222.00	1082.00	1277.00	2175.00
95	3431.00	3102.00	3211.00	3327.00	2936.00	3517.00	2900.00	3353.00	2316.00	2809.00	4671.00

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Table 9.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY VITAMIN A

MCG RETINOL EQUIV./DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 250	13.2%	12.1%	11.1%	18.6%	13.5%	11.9%	14.9%	28.6%	18.0%	28.5%	6.1%
250 - 500	26.6	23.6	19.3	8.3	16.5	24.5	29.2	17.8	20.2	22.4	14.2
500 - 750	18.3	28.5	20.1	16.8	14.7	20.1	19.3	16.1	23.1	10.0	20.4
750 - 1000	12.0	11.7	18.2	15.4	16.5	13.2	13.6	15.2	17.1	13.6	18.3
1000 - 1250	8.2	10.7	7.6	8.0	17.2	9.3	11.7	11.6	4.1	8.3	6.1
1250 - 1500	8.0	5.5	6.2	12.5	5.9	5.7	4.2	3.6	4.0	4.5	8.1
1500 - 1750	5.0	2.4	7.6	4.3	1.6	3.4	2.7	1.6	3.8	5.0	4.0
1750 - 2000	2.6	1.5	1.8	6.2	4.0	0.9	1.2	0.7	0.0	3.5	4.0
2000 - 2250	2.8	1.4	1.9	2.1	2.7	1.8	1.4	1.3	1.9	0.0	4.0
2250 - 2500	0.3	0.1	0.4	0.5	0.9	4.9	0.6	1.1	1.9	0.0	2.0
2500 - 2750	1.9	0.0	3.2	1.1	0.5	0.0	0.0	0.9	1.7	0.8	2.0
2750 - 3000	0.0	0.8	0.0	0.3	0.0	1.0	0.0	0.0	0.0	0.3	4.0
3000 - 3250	0.0	0.0	0.6	1.2	0.7	0.0	0.0	0.9	0.2	0.0	2.0
3250 - 3500	0.1	0.0	0.1	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0
3500 - 3750	0.0	0.0	0.0	1.1	1.1	0.0	0.2	0.0	0.0	0.1	0.0
3750 - 4000	0.0	0.7	0.0	0.7	1.1	1.5	0.0	0.0	0.2	0.0	0.0
4000 - 4250	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
4250 - 4500	0.0	0.0	0.0	0.0	1.1	0.0	0.3	0.0	0.0	0.0	2.0
4500 - 4750	0.0	0.0	0.0	0.6	0.0	0.3	0.0	0.0	0.0	0.0	0.0
4750 - 5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
5000 +	0.4	0.4	0.7	1.4	0.8	0.8	0.0	0.0	3.0	1.9	2.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	120.00	95.00	96.00	68.00	30.00	21.00	99.00	42.00	32.00	70.00	235.00
25	370.00	421.00	442.00	475.00	406.00	386.00	333.00	229.00	335.00	207.00	553.00
50	634.00	656.00	749.00	890.00	810.00	647.00	583.00	533.00	595.00	486.00	907.00
75	1133.00	943.00	1214.00	1450.00	1205.00	1135.00	947.00	954.00	950.00	1025.00	1592.00
95	2182.00	1803.00	2510.00	3004.00	3046.00	2398.00	1649.00	1774.00	2608.00	1976.00	3033.00

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Table 9.3

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM VITAMIN A

MCG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5 - 10	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 - 15	1.1	0.3	0.3	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.1
15 - 20	1.7	0.8	0.7	0.0	0.0	0.0	0.2	0.0	1.7	0.0	0.6
20 - 25	3.8	2.8	0.2	0.0	0.0	0.0	1.3	1.3	0.1	0.0	0.8
25 - 30	12.5	5.7	2.4	0.1	0.2	0.6	3.5	0.7	0.4	0.2	1.9
30 - 35	15.9	20.7	7.7	1.0	0.5	0.7	7.3	1.9	0.9	0.3	5.6
35 - 40	23.2	20.4	11.2	2.1	1.6	1.9	14.7	8.1	4.3	2.9	10.2
40 - 45	19.1	21.6	17.0	3.4	2.1	3.5	22.7	9.8	6.7	3.8	17.2
45 - 50	8.3	15.3	16.8	6.3	4.4	7.7	17.2	10.3	7.0	7.5	15.5
50 - 55	6.6	5.0	16.3	9.3	8.6	10.1	13.1	13.1	10.9	10.4	16.1
55 - 60	2.1	2.2	10.5	9.7	8.4	13.7	7.8	13.3	13.1	15.8	10.8
60 - 65	2.0	2.3	7.3	17.5	12.9	10.2	4.4	11.6	12.3	11.5	8.3
65 - 70	1.4	0.8	3.5	13.7	10.9	17.7	3.2	9.0	9.1	11.7	5.8
70 - 75	0.1	0.4	2.2	9.5	9.3	7.1	1.2	6.1	9.8	6.0	2.5
75 - 80	0.1	0.1	1.0	8.6	8.9	5.4	0.5	3.6	7.4	7.1	1.9
80 - 85	0.0	0.0	0.4	7.8	6.1	4.3	1.1	4.6	6.3	10.1	0.6
85 - 90	0.0	0.4	1.3	3.4	10.9	7.1	0.4	1.2	3.3	2.7	0.4
90 - 95	0.0	0.0	0.0	3.6	6.8	3.2	0.2	2.2	1.2	2.0	0.4
95 - 100	0.4	0.0	0.2	0.5	2.1	2.0	0.0	1.2	0.9	1.4	0.1
100 +	0.5	0.3	0.2	2.1	5.3	4.3	0.1	1.0	3.8	5.8	0.4
SAMPLE SIZE	518	1192	1372	994	1188	884	1457	1313	1466	793	720
PERCENTILES											
5	22.00	26.00	31.00	42.00	45.00	42.00	29.00	35.00	36.00	42.00	31.00
25	31.00	34.00	40.00	55.00	59.00	55.00	39.00	46.00	52.00	54.00	41.00
50	37.00	39.00	48.00	64.00	69.00	65.00	44.00	56.00	62.00	63.00	49.00
75	44.00	45.00	55.00	76.00	85.00	75.00	52.00	67.00	74.00	77.00	58.00
95	58.00	59.00	71.00	91.00	101.00	96.00	68.00	88.00	93.00	104.00	71.00

Nutrition Canada

Table 9.4

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM VITAMIN A

MCG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5 - 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 - 15	0.0	0.4	0.6	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.0
15 - 20	5.0	2.5	1.0	0.0	0.0	0.0	1.3	0.0	0.7	0.0	2.0
20 - 25	8.5	7.0	5.8	0.7	0.0	2.2	1.2	1.2	1.0	3.6	4.1
25 - 30	18.6	10.2	5.6	2.2	1.1	0.4	9.9	3.9	0.4	5.2	6.2
30 - 35	29.8	26.0	14.9	7.2	1.1	6.2	12.6	9.4	1.5	1.8	14.5
35 - 40	16.5	22.3	14.7	2.0	5.4	10.1	18.5	12.3	7.6	2.1	18.7
40 - 45	8.9	15.3	16.9	4.4	7.4	1.7	23.5	11.3	10.2	12.6	14.5
45 - 50	4.5	7.5	15.6	12.8	11.5	10.8	17.9	13.7	9.6	9.5	12.5
50 - 55	6.6	6.5	17.0	16.5	8.6	6.9	9.6	13.2	14.8	13.1	14.5
55 - 60	0.9	1.0	4.5	10.0	12.4	7.5	2.7	8.3	18.7	9.5	8.3
60 - 65	0.0	0.4	0.8	15.5	11.9	10.5	0.7	9.8	9.3	12.0	0.0
65 - 70	0.0	0.4	0.6	10.5	6.9	17.2	0.8	3.1	8.1	13.1	2.0
70 - 75	0.0	0.0	0.4	4.5	6.7	8.0	0.3	1.2	6.1	8.0	0.0
75 - 80	0.4	0.1	1.0	6.6	6.1	12.4	0.1	2.1	1.9	3.7	0.0
80 - 85	0.0	0.0	0.0	1.4	6.4	2.6	0.0	7.6	1.6	1.9	0.0
85 - 90	0.0	0.0	0.0	1.3	6.2	2.7	0.0	1.5	4.3	1.1	0.0
90 - 95	0.0	0.0	0.0	1.9	2.5	0.0	0.0	0.1	0.5	0.0	2.0
95 - 100	0.0	0.0	0.0	0.9	3.3	0.0	0.0	0.0	0.2	1.8	0.0
100 +	0.0	0.0	0.0	0.8	1.4	0.0	0.0	0.5	2.5	0.0	0.0
SAMPLE SIZE	95	215	192	136	131	114	245	188	174	109	48
PERCENTILES											
5	19.00	21.00	23.00	31.00	36.00	33.00	27.00	29.00	35.00	26.00	22.00
25	27.00	30.00	34.00	47.00	49.00	45.00	34.00	39.00	47.00	44.00	34.00
50	31.00	35.00	41.00	56.00	61.00	62.00	41.00	48.00	56.00	55.00	40.00
75	38.00	41.00	49.00	65.00	77.00	71.00	46.00	61.00	65.00	66.00	50.00
95	52.00	53.00	56.00	86.00	94.00	80.00	54.00	82.00	86.00	78.00	58.00

Nutrition Canada

Table 9.5

NATIONAL SURVEY
CLASSIFICATION OF SERUM VITAMIN A VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M[b]	19.5	9.1	2.3	0.0	0.0	0.0	1.8	0.4	3.0	0.0	2.4
	N[c]	165	418	489	371	405	265	482	466	488	251	250
URBAN	H	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
	M	27.4	17.1	5.1	0.0	0.8	1.6	7.0	4.7	1.8	0.1	5.0
	N	196	433	489	323	425	316	536	442	492	300	279
RURAL	H	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	24.5	20.2	7.2	2.4	0.7	0.8	10.0	4.8	2.2	0.7	7.3
	N	157	341	394	300	358	303	439	405	486	242	191
SUMMER-FALL	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	25.3	14.2	2.4	0.1	0.1	1.3	3.3	1.2	3.2	0.4	3.3
	N	265	581	643	444	553	462	704	605	699	399	335
WINTER-SPRING	H	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
	M	21.5	14.4	6.9	1.1	0.7	0.1	7.9	3.7	1.8	0.1	6.0
	N	253	611	729	550	635	422	753	708	767	394	385
TOTAL	H	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	M	23.3	14.3	4.5	0.6	0.4	0.7	5.6	2.5	2.5	0.2	4.7
	N	518	1192	1372	994	1188	884	1457	1313	1466	793	720

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 9.6

INDIAN SURVEY
CLASSIFICATION OF SERUM VITAMIN A VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M [b]	35.0	25.1	9.4	1.6	0.0	0.7	16.4	0.5	0.3	6.1	13.3
	N [c]	40	98	115	75	71	61	131	94	94	55	15
REMOTE	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	36.3	26.9	17.7	4.4	3.0	5.7	10.4	11.8	6.3	15.0	12.1
	N	55	117	77	61	60	53	114	94	80	54	33
ALGONKIAN	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	31.3	22.1	12.8	2.3	0.0	0.0	3.7	7.5	0.0	2.6	14.3
	N	30	59	41	34	37	18	51	55	40	20	14
IROQUOIAN	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	12.7	16.4	0.0	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
	N	11	30	36	16	18	19	38	24	30	14	3
PLAINS	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	41.0	23.4	14.6	5.3	2.5	5.8	12.8	6.1	4.1	16.2	11.1
	N	27	58	35	25	40	42	64	33	55	30	18
PLATEAU	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	38.6	52.9	16.9	2.9	0.0	4.2	23.7	10.0	7.3	3.2	25.0
	N	11	28	35	29	15	12	40	32	24	16	8
PACIFIC	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	28.1	34.1	4.6	0.0	0.0	0.0	20.9	0.0	0.0	7.8	0.0
	N	11	33	37	25	21	18	39	35	18	19	3
TOTAL [e]	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	35.7	26.1	13.3	3.0	1.2	2.7	13.7	6.3	2.4	9.4	12.5
	N	95	215	192	136	131	114	245	188	174	109	48
NATIONAL SURVEY TOTAL	H	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	M	23.5	14.3	4.5	0.6	0.4	0.7	5.6	2.5	2.5	0.2	4.7
	N	518	1192	1372	994	1188	884	1457	1313	1466	793	720

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 10.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM VITAMIN E

MCG/ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 2.0	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2.0 - 4.0	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1
4.0 - 6.0	6.1	3.5	6.2	1.7	0.7	2.3	2.7	2.0	0.3	0.7	1.1
6.0 - 8.0	25.8	16.2	24.2	11.0	5.4	7.0	18.0	11.0	4.4	4.5	1.5
8.0 - 10.0	40.2	36.3	36.6	21.0	12.1	16.1	40.4	23.7	12.3	14.6	7.8
10.0 - 12.0	18.3	24.6	21.0	23.7	19.0	21.0	21.2	31.6	17.8	9.4	11.7
12.0 - 14.0	2.9	12.2	7.2	20.3	23.7	15.2	11.8	18.0	25.4	17.0	18.9
14.0 - 16.0	4.0	4.7	2.9	10.7	16.5	20.5	3.4	8.9	15.9	21.0	20.6
16.0 - 18.0	0.0	1.0	0.7	5.1	7.8	8.6	1.2	2.0	10.7	10.8	16.7
18.0 - 20.0	0.6	0.2	0.0	3.0	5.5	4.2	0.0	1.7	4.6	13.4	9.5
20.0 - 22.0	0.0	0.2	0.2	2.1	4.3	2.6	0.0	0.6	2.0	2.7	5.9
22.0 - 24.0	0.0	0.0	0.0	0.6	1.7	1.0	0.1	0.0	1.7	2.3	2.9
24.0 - 26.0	0.0	0.0	0.0	0.0	0.7	0.2	0.2	0.0	2.0	0.8	1.6
26.0 - 28.0	0.0	0.2	0.0	0.0	0.3	0.2	0.3	0.0	0.6	0.9	0.9
28.0 - 30.0	0.0	0.2	0.0	0.0	0.2	0.3	0.0	0.0	0.1	0.7	0.0
30.0 - 32.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.9	0.0	0.0
32.0 - 34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0 - 36.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1
36.0 - 38.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
38.0 - 40.0	0.0	0.0	0.0	0.0	1.0	0.1	0.0	0.0	0.1	0.0	0.0
40.0 +	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
SAMPLE SIZE	518	1192	1372	994	1189	884	1456	1313	1465	794	723
PERCENTILES											
5	5.40	6.10	5.60	7.00	7.60	7.10	6.50	6.60	7.90	7.40	8.60
25	7.30	8.10	7.60	9.30	10.80	9.80	8.30	8.90	11.00	11.10	12.40
50	8.90	9.60	8.80	11.10	13.00	12.20	9.40	10.70	13.10	14.10	14.70
75	10.00	11.60	10.50	13.70	15.60	15.40	11.10	12.30	15.50	16.80	17.40
95	13.30	14.40	13.40	18.60	21.80	19.80	14.20	15.70	22.50	22.00	22.40

Nutrition Canada

Table 10.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM VITAMIN E

MCG/ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 2.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2.0 - 4.0	0.0	2.8	0.8	3.9	0.0	0.0	0.3	0.0	0.0	2.1	0.0
4.0 - 6.0	33.9	17.0	15.2	2.0	6.5	1.5	12.0	9.3	3.7	4.5	0.0
6.0 - 8.0	36.3	37.8	27.1	20.7	18.3	15.1	33.8	27.9	9.2	10.1	2.0
8.0 - 10.0	23.2	27.8	29.3	16.4	19.6	26.5	34.9	24.7	29.3	19.9	14.5
10.0 - 12.0	4.8	10.0	22.2	26.9	18.2	22.7	12.3	16.6	17.0	24.8	25.0
12.0 - 14.0	0.7	3.7	3.6	16.2	10.7	10.7	4.4	11.0	16.2	14.8	27.0
14.0 - 16.0	0.3	0.3	0.3	4.1	9.9	12.9	0.2	6.9	9.5	11.5	16.6
16.0 - 18.0	0.3	0.3	0.9	5.8	8.5	6.2	1.3	1.4	9.6	4.6	6.2
18.0 - 20.0	0.0	0.0	0.2	0.7	2.5	3.1	0.0	0.7	2.2	5.2	6.2
20.0 - 22.0	0.0	0.0	0.0	0.5	2.3	0.8	0.0	0.7	0.2	0.0	2.0
22.0 - 24.0	0.0	0.0	0.0	1.3	1.0	0.0	0.3	0.1	0.1	0.8	0.0
24.0 - 26.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2	0.6	0.0
26.0 - 28.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.1	0.8	0.0	0.0
28.0 - 30.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
30.0 - 32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.6	0.0
32.0 - 34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0 - 36.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
36.0 - 38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38.0 - 40.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40.0 +	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SAMPLE SIZE	95	215	192	136	131	114	245	188	174	109	48
PERCENTILES											
5	4.50	4.50	5.40	5.20	5.60	6.10	5.30	5.40	6.60	5.90	8.90
25	5.30	6.30	6.60	7.90	8.00	8.90	7.10	6.80	8.70	8.60	10.50
50	7.00	7.80	8.30	10.50	10.50	10.70	8.20	8.90	10.80	10.90	12.20
75	8.00	9.40	10.10	12.30	14.30	13.80	9.60	11.60	13.90	13.60	14.20
95	11.30	11.40	12.00	17.40	20.80	17.20	12.50	15.40	18.10	18.90	18.50

Table 11.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY CALCIUM

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 100	0.6%	0.0%	0.1%	1.1%	1.0%	0.3%	1.0%	0.1%	1.4%	0.2%	0.0%
100 - 200	0.6	0.9	1.0	1.4	1.1	1.5	3.9	6.8	5.3	5.6	1.0
200 - 300	1.7	3.2	3.0	5.1	2.2	8.1	6.1	9.7	11.0	14.1	4.0
300 - 400	3.7	2.9	4.8	4.6	8.5	13.6	4.8	8.7	14.1	15.7	4.5
400 - 500	6.6	5.5	3.9	7.7	9.7	8.8	6.7	12.0	12.0	12.0	6.2
500 - 600	6.9	6.4	4.1	6.0	6.6	17.3	7.4	13.9	11.9	11.6	4.8
600 - 700	7.5	7.2	4.8	5.7	13.5	11.3	7.6	9.5	12.6	8.8	6.3
700 - 800	11.2	5.6	7.7	7.4	8.1	8.7	6.2	5.0	8.6	7.5	7.5
800 - 900	9.6	6.7	7.1	7.1	7.7	6.6	5.7	6.8	4.8	8.0	6.2
900 - 1000	7.9	7.4	4.9	9.4	7.8	6.7	7.7	5.3	5.1	5.0	6.5
1000 - 1200	15.1	15.7	11.1	12.2	12.0	5.9	9.1	8.5	4.9	3.9	10.8
1200 - 1400	10.1	11.5	10.1	8.1	6.1	5.2	10.2	5.3	3.3	2.1	12.2
1400 - 1600	6.4	11.9	7.9	4.5	5.6	1.1	9.2	2.7	2.6	1.9	9.1
1600 - 1800	4.6	5.4	7.4	3.1	3.4	0.9	4.5	0.6	0.6	0.0	6.7
1800 - 2000	1.8	2.4	3.3	4.9	1.7	0.8	3.8	0.6	0.4	2.7	4.9
2000 - 2200	1.0	2.6	2.9	3.9	2.0	0.5	2.2	2.3	0.2	0.0	3.2
2200 - 2400	0.7	0.8	2.7	1.8	0.7	1.3	0.8	0.6	0.0	0.0	2.2
2400 - 2600	1.1	0.7	2.6	1.6	0.4	0.0	0.2	0.1	0.4	0.2	1.5
2600 - 2800	0.2	0.2	2.6	0.8	0.0	0.0	1.0	0.1	0.0	0.0	0.6
2800 - 3000	0.4	0.1	2.7	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.2
3000 +	1.2	1.8	4.4	2.5	0.5	0.6	0.6	0.3	0.0	0.0	0.7
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	362.00	315.00	323.00	274.00	305.00	257.00	195.00	168.00	169.00	195.00	298.00
25	668.00	681.00	748.00	590.00	538.00	417.00	528.00	397.00	355.00	335.00	669.00
50	911.00	1023.00	1157.00	957.00	777.00	600.00	900.00	587.00	537.00	518.00	1041.00
75	1232.00	1418.00	1699.00	1369.00	1084.00	877.00	1361.00	930.00	776.00	787.00	1483.00
95	2009.00	2113.00	2927.00	2420.00	1933.00	1497.00	2028.00	1576.00	1348.00	1399.00	2221.00

Nutrition Canada

Table 11.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY CALCIUM

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 100	2.3%	0.3%	0.3%	1.6%	2.2%	3.4%	2.6%	1.8%	5.0%	3.7%	2.0%
100 - 200	5.4	1.9	2.8	5.3	2.8	4.8	8.6	11.7	8.4	15.4	10.2
200 - 300	3.8	4.3	1.6	8.1	12.1	17.6	9.0	25.2	15.1	14.7	8.1
300 - 400	5.5	7.3	9.7	11.4	18.5	19.4	14.1	9.0	13.8	10.9	10.2
400 - 500	4.5	13.2	12.4	12.3	13.0	14.0	10.3	11.9	11.2	11.5	8.1
500 - 600	11.8	16.9	10.8	12.5	14.1	10.0	11.7	7.0	10.2	15.5	20.4
600 - 700	8.8	8.2	18.3	7.4	6.4	8.8	8.0	8.2	13.2	7.6	14.2
700 - 800	9.7	9.2	7.7	9.6	6.8	5.9	7.3	5.1	6.3	5.3	2.0
800 - 900	2.9	8.8	4.1	6.2	5.2	3.3	3.0	2.9	5.2	1.1	8.1
900 - 1000	9.0	4.1	3.6	4.0	4.5	3.3	5.3	0.8	0.4	5.8	0.0
1000 - 1200	11.9	11.1	8.4	7.9	5.5	3.3	8.9	5.4	4.9	6.6	8.1
1200 - 1400	10.8	5.0	6.8	3.5	1.8	1.0	2.2	5.5	3.2	0.8	4.0
1400 - 1600	4.0	3.2	5.3	2.7	2.7	0.9	3.5	1.0	2.5	0.4	2.0
1600 - 1800	1.5	1.3	3.4	3.0	1.4	2.5	1.3	0.9	0.0	0.0	0.0
1800 - 2000	2.5	0.2	0.6	1.5	0.0	1.0	1.0	1.4	0.0	0.0	2.0
2000 - 2200	0.1	0.0	0.9	0.5	0.0	0.0	1.8	0.0	0.0	0.0	0.0
2200 - 2400	2.9	3.5	0.2	0.5	1.1	0.0	0.2	0.0	0.0	0.0	0.0
2400 - 2600	1.7	0.5	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0
2600 - 2800	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2800 - 3000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3000 +	0.0	0.0	1.8	0.6	1.1	0.0	0.0	1.5	0.0	0.0	0.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	145.00	260.00	305.00	155.00	142.00	121.00	137.00	141.00	97.00	118.00	129.00
25	537.00	473.00	495.00	390.00	345.00	292.00	369.00	237.00	283.00	235.00	339.00
50	766.00	655.00	660.00	583.00	523.00	441.00	534.00	423.00	458.00	449.00	564.00
75	1158.00	1003.00	1058.00	953.00	792.00	649.00	882.00	694.00	678.00	619.00	736.00
95	1965.00	1692.00	1771.00	1726.00	1465.00	1234.00	1552.00	1270.00	1253.00	1123.00	1381.00

Table 11.3

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF POTENTIAL DIETARY VITAMIN D

I.U./DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 50	4.1%	7.1%	12.1%	36.7%	28.2%	23.5%	20.5%	37.5%	39.9%	33.0%	13.1%
50 - 100	6.0	9.0	10.7	12.2	19.5	26.4	10.3	18.7	20.1	19.3	8.0
100 - 150	9.4	10.1	8.8	12.6	12.1	12.7	14.3	13.1	15.0	17.4	8.7
150 - 200	11.7	13.8	10.1	6.1	10.5	11.5	11.3	8.1	9.3	11.6	6.3
200 - 250	11.7	11.7	8.1	6.3	6.9	10.9	10.0	8.8	4.9	6.5	7.2
250 - 300	7.8	8.2	10.4	5.2	4.3	4.2	9.1	5.5	2.2	2.6	5.2
300 - 350	6.2	8.0	6.8	5.8	5.1	1.0	5.8	1.2	1.0	2.3	4.8
350 - 400	4.1	7.3	6.1	2.8	3.6	1.2	5.5	1.1	2.1	0.3	4.9
400 - 450	4.6	3.8	4.2	3.5	1.4	1.6	2.8	1.0	1.4	1.7	5.4
450 - 500	2.9	2.8	3.5	2.8	2.4	2.0	1.4	1.4	0.6	0.2	4.8
500 - 550	4.0	1.8	3.9	1.9	1.6	2.0	1.6	0.8	0.9	1.2	5.7
550 - 600	3.1	4.6	3.4	0.7	0.8	0.2	1.1	1.3	0.1	2.1	5.4
600 - 650	3.4	1.7	1.7	0.2	0.7	0.4	1.4	0.4	0.6	0.1	4.2
650 - 700	5.7	2.1	1.3	0.4	0.9	0.9	0.4	0.0	0.2	0.0	4.1
700 - 750	3.0	3.3	0.5	0.3	0.4	0.0	1.2	0.0	0.2	0.4	1.8
750 - 800	2.0	1.0	3.0	0.2	0.0	0.1	0.8	0.0	0.0	0.1	1.5
800 - 850	0.9	0.4	1.0	0.1	0.4	0.0	0.7	0.0	0.0	0.0	0.9
850 - 900	0.9	0.1	0.5	0.0	0.2	0.2	0.5	0.0	0.0	0.0	1.6
900 - 950	0.3	0.2	0.4	1.1	0.0	0.0	0.1	0.0	0.0	0.1	0.3
950 - 1000	0.4	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.7
1000 +	6.5	2.0	2.1	0.2	0.2	0.3	0.1	0.3	0.4	0.2	4.2
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	54.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	174.00	144.00	111.00	20.00	33.00	54.00	74.00	22.00	22.00	29.00	121.00
50	290.00	242.00	248.00	108.00	108.00	101.00	172.00	80.00	75.00	95.00	317.00
75	577.00	393.00	421.00	261.00	242.00	200.00	292.00	188.00	147.00	167.00	558.00
95	1127.00	738.00	789.00	502.00	503.00	492.00	620.00	431.00	402.00	435.00	952.00

Nutrition Canada

Table 11.4

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF POTENTIAL DIETARY VITAMIN D

I.U./DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 50	16.7%	20.6%	27.3%	40.5%	41.0%	42.9%	43.8%	51.3%	41.5%	47.9%	36.7%
50 - 100	12.1	12.4	13.6	19.6	24.0	21.8	11.0	25.5	18.8	14.4	18.3
100 - 150	10.7	18.2	21.8	5.4	11.3	16.1	13.4	10.7	16.5	19.6	16.3
150 - 200	6.0	13.9	7.0	8.6	10.3	5.6	11.7	5.5	8.8	7.5	6.1
200 - 250	13.6	9.6	8.2	7.6	3.9	2.3	6.9	2.4	5.1	3.9	4.0
250 - 300	6.0	7.7	8.0	5.8	3.5	5.6	1.3	0.7	5.0	5.4	2.0
300 - 350	5.3	4.2	4.3	2.3	1.1	1.0	4.2	0.3	0.2	0.0	0.0
350 - 400	7.7	5.3	3.9	3.6	3.4	1.4	0.0	1.6	0.4	0.8	0.0
400 - 450	5.7	0.8	2.4	1.6	0.5	0.6	1.6	0.6	0.0	0.0	4.0
450 - 500	1.7	1.4	1.6	0.0	0.0	0.3	2.1	0.4	1.5	0.0	2.0
500 - 550	3.3	0.3	0.0	3.7	0.0	1.0	0.0	0.2	1.6	0.0	8.1
550 - 600	3.7	1.0	0.1	0.0	0.0	0.0	0.6	0.2	0.0	0.0	0.0
600 - 650	3.0	3.5	0.3	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
650 - 700	0.6	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0	0.0	0.0
700 - 750	0.7	0.2	0.1	0.0	0.0	0.9	0.0	0.0	0.0	0.0	2.0
750 - 800	1.5	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
800 - 850	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
850 - 900	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
900 - 950	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
950 - 1000	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1000 +	0.7	0.0	0.0	0.0	0.5	0.0	0.2	0.0	0.0	0.0	0.0
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	79.00	60.00	46.00	7.00	26.00	15.00	22.00	0.00	24.00	15.00	22.00
50	217.00	149.00	115.00	72.00	83.00	70.00	74.00	47.00	64.00	67.00	84.00
75	393.00	252.00	237.00	217.00	128.00	122.00	169.00	91.00	144.00	124.00	156.00
95	649.00	560.00	430.00	407.00	333.00	326.00	462.00	245.00	281.00	252.00	547.00

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Table 11.5

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM CALCIUM

MG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 8.0	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	1.3%	0.2%	0.4%	0.0%	0.2%
8.0 - 8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
8.2 - 8.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.0
8.4 - 8.6	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.2	0.2	0.1
8.6 - 8.8	0.0	0.0	0.0	0.2	0.5	0.0	0.0	0.3	0.1	0.2	0.6
8.8 - 9.0	0.5	0.0	0.4	0.2	0.3	1.0	0.4	0.8	1.4	0.2	3.8
9.0 - 9.2	0.4	1.0	0.4	0.7	2.3	2.9	0.3	2.8	1.5	2.4	7.5
9.2 - 9.4	1.8	1.4	1.7	1.4	3.5	4.8	1.6	8.6	7.9	4.9	14.8
9.4 - 9.6	2.5	7.4	4.5	6.4	9.9	14.0	5.2	11.9	10.6	10.0	20.4
9.6 - 9.8	7.7	10.8	9.3	8.9	15.5	14.6	10.6	18.9	20.1	14.9	20.7
9.8 - 10.0	10.2	16.7	17.6	19.5	18.9	17.7	20.6	19.7	16.3	19.9	15.8
10.0 - 10.2	19.8	21.6	20.2	23.7	17.4	18.4	25.3	17.3	17.8	13.7	8.5
10.2 - 10.4	21.3	19.9	19.5	15.3	13.7	13.2	16.5	9.1	11.7	15.3	3.6
10.4 - 10.6	10.5	11.4	12.9	11.3	8.0	7.8	9.3	5.0	5.2	5.4	1.7
10.6 - 10.8	13.4	5.8	6.1	5.2	3.3	3.2	5.1	1.8	2.2	5.2	1.0
10.8 - 11.0	7.2	1.8	2.3	2.2	2.5	0.0	1.3	1.8	2.1	2.4	0.2
11.0 - 11.2	2.2	1.3	2.2	1.7	2.0	1.0	1.3	0.3	0.5	0.7	0.0
11.2 - 11.4	1.0	0.2	0.6	0.2	0.8	0.2	0.2	0.6	0.4	0.0	0.0
11.4 - 11.6	0.1	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.4	0.6	0.1
11.6 - 11.8	0.0	0.0	1.3	1.1	0.0	0.0	0.0	0.0	0.0	1.0	0.0
11.8 +	0.6	0.0	0.0	0.8	0.1	0.0	0.1	0.0	0.2	1.3	0.0
SAMPLE SIZE	547	1234	1395	1008	1210	894	1476	1332	1492	803	733
PERCENTILES											
5	9.53	9.48	9.52	9.50	9.30	9.25	9.46	9.22	9.22	9.22	8.99
25	10.01	9.87	9.90	9.88	9.70	9.62	9.86	9.59	9.63	9.70	9.37
50	10.27	10.09	10.14	10.11	9.99	9.96	10.05	9.85	9.87	9.97	9.61
75	10.57	10.36	10.41	10.36	10.29	10.23	10.29	10.12	10.18	10.32	9.88
95	10.97	10.77	10.90	10.86	10.88	10.59	10.71	10.58	10.71	10.92	10.30

Table 11.6

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM CALCIUM

MG/100ML	*0-4 MF*	*5-9 MF*	*10-19 M*	*20-39 M*	*40-54 M*	*55 + M*	*10-19 F*	*20-39 F*	*40-54 F*	*55 + F*	*PREGNANT WOMEN*
0.0 - 8.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.8%	0.0%
8.0 - 8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
8.2 - 8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.4 - 8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.0
8.6 - 8.8	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.0	1.1	0.0	4.1
8.8 - 9.0	0.0	0.6	0.7	1.1	0.6	4.7	1.1	0.3	1.1	3.2	0.0
9.0 - 9.2	0.0	1.5	0.7	2.8	2.1	6.3	2.5	7.3	3.9	1.7	8.3
9.2 - 9.4	0.4	7.1	6.9	3.3	17.9	11.4	4.9	10.0	7.9	7.4	16.6
9.4 - 9.6	14.3	7.2	13.1	11.1	11.0	12.1	9.1	16.3	9.6	22.9	20.8
9.6 - 9.8	7.2	20.6	14.1	14.2	18.7	25.4	17.4	24.9	22.9	10.0	20.8
9.8 - 10.0	18.3	16.2	19.7	12.9	18.2	10.3	21.4	18.0	19.7	19.5	12.5
10.0 - 10.2	16.3	16.1	22.6	21.4	14.5	12.0	22.8	10.6	12.6	11.9	8.3
10.2 - 10.4	13.0	17.7	10.5	21.5	5.5	6.1	8.3	6.0	6.2	10.8	4.1
10.4 - 10.6	15.7	6.2	4.1	3.3	6.2	3.6	4.8	2.7	6.4	7.3	0.0
10.6 - 10.8	4.8	2.1	3.2	3.2	1.6	1.7	3.7	0.7	3.0	1.5	0.0
10.8 - 11.0	7.4	3.0	2.3	4.1	1.2	5.1	3.2	0.3	4.2	0.9	2.0
11.0 - 11.2	0.4	0.2	0.7	0.5	0.5	0.0	0.2	0.4	0.5	0.5	0.0
11.2 - 11.4	1.3	0.4	0.7	0.0	1.1	0.0	0.0	0.0	0.3	0.0	0.0
11.4 - 11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11.6 - 11.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11.8 +	0.2	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.2	0.0
SAMPLE SIZE	109	227	198	134	131	114	254	190	176	111	48
PERCENTILES											
5	9.44	9.28	9.27	9.35	9.26	9.00	9.22	9.07	9.17	9.03	8.78
25	9.86	9.67	9.64	9.70	9.50	9.49	9.67	9.54	9.60	9.48	9.34
50	10.10	9.94	9.95	10.01	9.77	9.67	9.93	9.72	9.82	9.80	9.53
75	10.46	10.24	10.17	10.24	10.05	10.06	10.14	9.96	10.13	10.10	9.80
95	10.98	10.66	10.67	10.76	10.58	10.84	10.69	10.39	10.81	10.56	10.23

Nutrition Canada

Table 11.7

NATIONAL SURVEY
CLASSIFICATION OF SERUM CALCIUM VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.0	0.1	1.3	0.1	1.1	0.6	3.1	1.5	2.8	0.2	5.5
	M[b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N[c]	174	435	499	375	410	264	488	474	496	257	254
URBAN	H	1.1	0.1	0.1	0.2	1.3	1.1	0.6	2.5	1.7	1.8	5.3
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	205	441	493	328	430	318	538	449	498	302	283
RURAL	H	0.6	0.4	0.5	2.1	1.0	2.4	1.5	0.4	2.1	3.7	4.1
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	168	358	403	305	370	312	450	409	498	244	196
SUMMER-FALL	H	0.0	0.0	0.6	0.1	0.2	0.2	0.4	1.2	3.0	0.7	3.5
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	282	599	650	452	565	466	717	614	712	398	340
WINTER-SPRING	H	0.9	0.3	0.9	1.1	2.1	2.5	3.7	1.9	1.7	2.4	6.4
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	265	635	745	556	645	428	759	718	780	405	393
TOTAL	H	0.5	0.2	0.7	0.6	1.1	1.4	2.0	1.5	2.4	1.6	5.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	547	1234	1395	1008	1210	894	1476	1332	1492	803	733

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 11.8

INDIAN SURVEY
CLASSIFICATION OF SERUM CALCIUM VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.0	0.5	0.0	0.0	1.2	2.1	0.0	0.6	0.4	2.5	6.7
	M [b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N [c]	45	107	117	74	71	60	135	97	96	56	15
REMOTE	H	0.0	1.6	1.7	2.2	0.6	8.7	2.5	3.6	5.9	8.2	6.1
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	64	120	81	60	60	54	119	93	80	55	33
ALGONKIAN	H	0.0	0.0	0.0	0.0	1.2	8.1	1.4	0.0	1.4	0.0	14.3
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	35	63	45	32	37	18	57	57	40	20	14
IROQUOIAN	H	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	1.8	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	11	30	36	16	18	19	38	24	31	14	3
PLAINS	H	0.0	1.7	2.1	2.6	0.0	5.3	2.0	2.9	4.1	6.8	5.6
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	30	61	35	25	40	42	65	35	55	30	18
PLATEAU	H	0.0	0.0	0.0	0.0	4.7	0.0	0.0	4.3	0.0	15.8	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	15	30	35	29	15	13	44	31	24	17	8
PACIFIC	H	0.0	1.9	0.0	0.0	2.9	0.0	0.0	5.7	0.0	3.8	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	13	34	37	25	21	17	38	34	19	20	3
TOTAL [e]	H	0.0	1.1	0.8	1.1	0.9	4.8	1.2	2.1	2.3	4.7	6.3
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	109	227	198	134	131	114	254	190	176	111	48
NATIONAL SURVEY TOTAL	H	0.5	0.2	0.7	0.6	1.1	1.4	2.0	1.5	2.4	1.6	5.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	547	1234	1395	1008	1210	894	1476	1332	1492	803	733

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 11.9

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM PHOSPHORUS

MG/100ML	0-4 MF	5-9 MF	10-19 M	20–39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.00 - 2.40	0.0%	0.0%	0.1%	0.7%	2.3%	3.5%	0.0%	1.7%	1.9%	2.0%	0.4%
2.40 - 2.60	0.0	0.0	0.0	2.6	5.8	5.7	0.3	4.0	3.2	4.8	1.0
2.60 - 2.80	0.0	0.0	0.7	4.9	4.9	8.6	0.7	7.7	5.7	2.7	3.8
2.80 - 3.00	0.0	0.6	0.8	8.7	7.3	13.8	1.5	9.1	11.6	8.4	5.1
3.00 - 3.20	0.2	0.2	1.8	7.9	12.2	15.2	4.8	15.9	12.8	14.7	11.4
3.20 - 3.40	0.0	0.3	4.8	14.3	10.0	19.0	5.7	14.3	12.7	19.0	15.6
3.40 - 3.60	0.2	0.8	4.5	14.3	15.1	15.9	8.5	17.2	14.2	16.8	17.6
3.60 - 3.80	0.5	3.6	8.9	11.6	11.5	7.3	9.4	12.2	14.2	11.7	17.4
3.80 - 4.00	2.9	4.0	8.1	13.3	12.8	3.5	15.4	6.6	11.7	9.7	13.1
4.00 - 4.20	1.7	5.3	11.4	8.9	7.4	4.5	12.1	4.3	4.2	4.3	7.7
4.20 - 4:40	5.8	13.9	12.8	6.7	4.7	1.2	16.2	2.2	2.1	3.5	3.4
4.40 - 4.60	7.6	17.6	10.6	1.8	1.1	0.7	7.7	2.2	1.5	1.5	0.8
4.60 - 4.80	16.5	14.2	10.6	0.9	1.2	0.0	6.3	0.7	0.7	0.1	0.8
4.80 - 5.00	18.0	14.7	5.4	0.9	0.3	0.0	4.8	0.6	0.4	0.0	0.4
5.00 - 5.20	14.6	8.9	8.5	0.2	0.4	0.2	2.9	0.0	0.2	0.0	0.5
5.20 - 5.40	11.3	8.8	4.6	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.2
5.40 - 5.60	8.3	3.2	2.4	0.1	0.0	0.0	0.6	0.0	0.0	0.0	0.0
5.60 - 5.80	5.9	0.3	1.6	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
5.80 - 6.00	1.4	0.8	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
6.00 - 6.20	0.9	0.7	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
6.20 +	3.4	1.4	0.6	1.5	2.0	0.0	0.8	0.6	2.0	0.0	0.1
SAMPLE SIZE	546	1232	1398	1009	1211	897	1474	1335	1494	809	735
PERCENTILES											
5	4.10	3.70	3.20	2.60	2.50	2.40	3.00	2.50	2.50	2.50	2.70
25	4.70	4.30	3.80	3.20	3.00	2.90	3.60	3.00	3.00	3.00	3.20
50	4.90	4.60	4.30	3.50	3.40	3.20	4.00	3.30	3.40	3.30	3.50
75	5.30	4.90	4.70	3.90	3.80	3.40	4.30	3.60	3.70	3.70	3.80
95	5.80	5.40	5.40	4.40	4.40	4.00	5.00	4.30	4.40	4.20	4.20

Nutrition Canada

Table 11.10

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM PHOSPHORUS

MG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.00 - 2.40	0.0%	0.0%	0.0%	1.2%	0.0%	4.3%	0.0%	2.4%	0.4%	0.5%	0.0%
2.40 - 2.60	0.0	0.0	0.0	0.8	10.8	3.9	0.0	3.7	4.4	0.0	0.0
2.60 - 2.80	0.0	0.0	1.7	4.5	6.5	7.9	0.3	11.7	4.6	9.2	4.1
2.80 - 3.00	0.0	0.4	0.4	2.2	12.2	24.1	1.0	9.1	10.6	11.9	6.2
3.00 - 3.20	0.0	0.0	2.7	12.1	11.9	12.8	2.2	15.5	16.3	9.1	14.5
3.20 - 3.40	0.0	0.0	1.2	14.4	8.0	14.1	3.9	17.0	18.0	13.7	16.6
3.40 - 3.60	0.0	0.0	1.4	14.8	15.2	10.7	6.1	9.6	10.2	14.9	12.5
3.60 - 3.80	0.0	1.5	4.5	16.6	14.4	7.9	8.5	10.6	12.2	13.7	12.5
3.80 - 4.00	2.0	3.2	3.5	14.2	4.7	4.4	10.5	9.7	5.4	7.6	16.6
4.00 - 4.20	3.0	3.5	13.8	11.5	5.7	3.3	8.7	5.9	7.3	13.7	6.2
4.20 - 4.40	6.6	9.1	13.4	4.7	7.9	1.5	13.3	0.8	5.6	1.6	4.1
4.40 - 4.60	13.3	11.1	19.1	2.2	0.9	1.5	10.6	0.6	2.6	2.5	2.0
4.60 - 4.80	15.7	26.0	8.7	0.0	0.5	0.6	13.8	1.9	0.0	0.6	2.0
4.80 - 5.00	19.0	17.8	9.7	0.0	0.8	0.0	7.5	0.0	0.4	0.0	0.0
5.00 - 5.20	12.5	9.2	10.5	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0
5.20 - 5.40	11.6	10.1	4.9	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0
5.40 - 5.60	5.0	4.3	2.7	0.2	0.0	2.3	0.4	0.0	1.1	0.0	0.0
5.60 - 5.80	2.6	1.6	0.0	0.0	0.0	0.0	2.1	0.7	0.0	0.0	0.0
5.80 - 6.00	4.5	1.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.00 - 6.20	2.4	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	2.0
6.20 +	0.9	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0
SAMPLE SIZE	110	229	198	135	131	115	255	192	176	111	48
PERCENTILES											
5	4.10	3.90	3.20	2.70	2.50	2.40	3.20	2.50	2.60	2.60	2.80
25	4.50	4.50	4.10	3.20	2.90	2.80	3.80	2.90	3.00	3.00	3.10
50	4.80	4.70	4.40	3.50	3.40	3.10	4.20	3.20	3.30	3.50	3.50
75	5.20	5.00	4.80	3.90	3.60	3.40	4.70	3.70	3.70	3.80	3.80
95	5.90	5.50	5.30	4.20	4.20	4.20	5.20	4.10	4.30	4.20	4.40

Table 11.11

NATIONAL SURVEY
CLASSIFICATION OF SERUM PHOSPHORUS VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	4.6										
	M[b]	0.0										
	N[c]	175										
URBAN	H	4.4										
	M	0.0										
	N	204										
RURAL	H	3.3										
	M	0.0										
	N	167										
SUMMER-FALL	H	4.7										
	M	0.0										
	N	281										
WINTER-SPRING	H	3.6										
	M	0.0										
	N	265										
TOTAL	H	4.1										
	M	0.0										
	N	546										

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 11.12

INDIAN SURVEY
CLASSIFICATION OF SERUM PHOSPHORUS VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.5										
	M [b]	0.0										
	N [c]	45										
REMOTE	H	3.3										
	M	0.0										
	N	65										
ALGONKIAN	H	0.0										
	M	0.0										
	N	35										
IROQUOIAN	H	0.0										
	M	0.0										
	N	11										
PLAINS	H	3.2										
	M	0.0										
	N	31										
PLATEAU	H	6.3										
	M	0.0										
	N	15										
PACIFIC	H	0.0										
	M	0.0										
	N	13										
TOTAL [e]	H	2.1										
	M	0.0										
	N	110										
NATIONAL SURVEY TOTAL	H	4.1										
	M	0.0										
	N	546										

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 11.13

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM ALKALINE PHOSPHATASE

I.U.	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 25	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	0.0%	0.0%
25 - 50	0.0	0.3	0.4	4.7	6.2	3.5	3.7	24.0	14.6	2.1	11.6
50 - 75	0.3	0.3	3.1	50.2	40.4	34.2	22.3	51.4	44.0	25.5	27.4
75 - 100	0.1	1.4	10.8	35.3	36.6	37.1	19.0	20.7	28.2	44.8	23.7
100 - 125	0.3	2.4	5.3	7.0	13.0	11.1	12.1	2.1	8.1	17.7	14.9
125 - 150	8.7	7.4	6.4	1.5	2.0	10.7	4.5	0.5	2.2	5.4	10.5
150 - 175	11.1	13.5	9.2	0.6	0.2	1.6	5.8	0.0	0.5	0.6	5.4
175 - 200	20.3	19.2	12.1	0.1	0.5	0.3	7.9	0.1	0.5	1.7	3.1
200 - 225	23.5	18.8	12.6	0.0	0.5	0.1	4.4	0.2	0.5	0.0	1.0
225 - 250	14.6	14.5	9.9	0.0	0.0	0.0	5.7	0.2	0.1	0.2	1.3
250 - 275	9.6	8.5	6.1	0.1	0.0	0.0	5.5	0.0	0.0	0.0	0.1
275 - 300	4.9	7.3	9.6	0.0	0.0	0.1	2.9	0.3	0.0	0.0	0.0
300 - 325	2.7	3.3	3.4	0.0	0.0	0.0	3.6	0.0	0.4	0.0	0.0
325 - 350	1.2	0.9	2.0	0.0	0.0	0.0	0.7	0.0	0.0	1.1	0.1
350 - 375	1.0	1.3	3.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1
375 - 400	0.2	0.0	2.1	0.0	0.0	0.0	0.5	0.0	0.0	0.3	0.0
400 - 425	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
425 - 450	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
450 - 475	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
475 - 500	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500 +	0.2	0.0	0.5	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.1
SAMPLE SIZE	546	1232	1400	1009	1213	897	1475	1335	1496	807	736
PERCENTILES											
5	136.00	128.00	78.00	50.00	47.00	52.00	51.00	38.00	41.00	56.00	44.00
25	179.00	172.00	145.00	63.00	63.00	67.00	74.00	50.00	55.00	72.00	62.00
50	211.00	208.00	201.00	72.00	76.00	83.00	109.00	58.00	68.00	87.00	86.00
75	242.00	244.00	268.00	86.00	91.00	99.00	196.00	74.00	85.00	101.00	119.00
95	302.00	308.00	377.00	111.00	116.00	136.00	302.00	95.00	121.00	139.00	184.00

Nutrition Canada

Table 11.14

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM ALKALINE PHOSPHATASE

I.U.	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25 - 50	0.0	0.0	0.0	0.7	0.0	0.0	0.5	10.5	3.8	0.0	4.2
50 - 75	0.0	0.0	0.2	19.0	19.2	20.6	7.1	28.7	27.0	13.3	8.5
75 - 100	0.0	0.0	4.0	55.3	36.7	42.6	17.2	43.3	34.6	32.2	29.7
100 - 125	3.0	1.7	3.2	15.4	31.2	27.3	13.8	10.4	26.3	30.9	21.2
125 - 150	2.7	6.7	7.3	8.1	10.9	6.6	5.7	1.9	4.3	16.4	10.6
150 - 175	10.5	11.1	9.3	0.7	1.5	2.2	6.8	2.3	2.3	2.0	4.2
175 - 200	20.5	23.7	10.5	0.0	0.2	0.0	7.2	0.6	0.3	2.7	8.5
200 - 225	26.1	22.8	10.5	0.5	0.0	0.0	5.3	0.0	0.0	0.0	4.2
225 - 250	13.1	12.8	15.6	0.0	0.0	0.0	9.6	0.7	0.2	0.0	0.0
250 - 275	12.0	7.1	10.4	0.0	0.0	0.0	7.3	0.2	0.2	2.1	4.2
275 - 300	3.7	6.1	11.8	0.0	0.0	0.0	6.0	0.3	0.0	0.0	2.1
300 - 325	1.8	2.7	5.6	0.0	0.0	0.0	5.4	0.0	0.5	0.0	2.1
325 - 350	1.8	4.3	5.1	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0
350 - 375	0.3	0.3	2.1	0.0	0.0	0.2	3.0	0.0	0.0	0.0	0.0
375 - 400	0.0	0.0	1.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
400 - 425	1.8	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
425 - 450	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
450 - 475	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
475 - 500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500 +	0.2	0.0	0.5	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
SAMPLE SIZE	110	229	198	135	131	115	255	192	176	111	47
PERCENTILES											
5	141.00	135.00	109.00	59.00	64.00	59.00	67.00	42.00	51.00	65.00	63.00
25	191.00	180.00	175.00	76.00	77.00	77.00	100.00	62.00	72.00	88.00	85.00
50	213.00	211.00	231.00	87.00	94.00	89.00	168.00	81.00	88.00	101.00	108.00
75	236.00	236.00	287.00	99.00	115.00	109.00	258.00	93.00	106.00	122.00	160.00
95	329.00	313.00	355.00	135.00	133.00	133.00	345.00	141.00	139.00	160.00	273.00

Nutrition Canada

Table 11.15

NATIONAL SURVEY
CLASSIFICATION OF SERUM CALCIUM/PHOSPHORUS VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.0										
	M[b]	4.6										
	N[c]	174										
URBAN	H	0.0										
	M	5.5										
	N	204										
RURAL	H	0.0										
	M	4.0										
	N	167										
SUMMER-FALL	H	0.0										
	M	4.7										
	N	281										
WINTER-SPRING	H	0.0										
	M	4.6										
	N	264										
TOTAL	H	0.0										
	M	4.6										
	N	545										

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 11.16

INDIAN SURVEY
CLASSIFICATION OF SERUM CALCIUM/PHOSPHORUS VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.0										
	M [b]	0.5										
	N [c]	45										
REMOTE	H	0.0										
	M	3.4										
	N	64										
ALGONKIAN	H	0.0										
	M	0.0										
	N	35										
IROQUOIAN	H	0.0										
	M	0.0										
	N	11										
PLAINS	H	0.0										
	M	3.3										
	N	30										
PLATEAU	H	0.0										
	M	6.3										
	N	15										
PACIFIC	H	0.0										
	M	0.0										
	N	13										
TOTAL [e]	H	0.0										
	M	2.1										
	N	109										
NATIONAL SURVEY TOTAL	H	0.0										
	M	4.6										
	N	545										

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 12.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY IRON

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 6.0	23.3%	9.3%	3.3%	4.0%	3.3%	4.9%	10.1%	9.4%	10.4%	8.4%	2.9%
6.0 - 8.0	20.3	15.6	5.6	5.4	5.6	16.4	14.3	12.9	14.0	21.8	8.0
8.0 - 10.0	13.6	20.4	9.8	5.3	8.6	13.0	15.5	15.3	17.5	24.9	8.2
10.0 - 12.0	11.4	17.0	14.1	7.9	13.9	12.9	18.8	17.1	14.9	12.8	10.6
12.0 - 14.0	6.4	11.3	10.6	9.6	14.2	11.8	13.7	14.1	14.0	12.0	10.2
14.0 - 16.0	4.9	7.4	12.1	8.0	13.0	8.3	8.4	11.0	7.8	6.5	5.5
16.0 - 18.0	3.0	7.6	9.5	15.6	8.3	13.5	5.8	5.6	5.5	3.2	5.3
18.0 - 20.0	2.8	2.7	6.4	11.3	9.5	6.0	3.3	3.1	4.6	4.4	1.9
20.0 - 22.0	0.8	1.9	5.0	5.8	7.4	3.6	3.0	4.2	3.1	0.5	1.8
22.0 - 24.0	0.7	1.6	3.9	4.8	3.6	1.7	1.3	1.9	1.6	2.4	1.1
24.0 - 26.0	0.5	1.0	4.0	5.1	3.6	1.2	0.9	0.7	1.6	0.8	1.1
26.0 - 28.0	0.5	0.8	3.4	2.2	1.6	1.8	0.3	1.0	0.6	0.5	1.9
28.0 - 30.0	0.4	0.3	3.5	2.1	1.0	1.0	0.6	0.2	0.6	0.0	1.1
30.0 - 32.0	1.1	0.5	0.8	3.9	1.0	1.1	0.2	0.2	1.6	0.1	0.5
32.0 - 34.0	0.9	0.2	1.6	0.5	1.6	0.6	0.1	0.7	0.0	0.1	0.2
34.0 - 36.0	0.6	0.0	0.8	1.9	0.7	0.3	0.1	0.0	0.0	0.0	0.2
36.0 - 38.0	0.2	0.3	1.1	1.2	0.7	0.4	0.2	0.1	0.1	0.3	0.2
38.0 - 40.0	0.0	0.1	0.7	0.0	0.3	0.1	0.0	0.0	0.1	0.1	0.6
40.0 - 42.0	1.0	0.0	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.3
42.0 - 44.0	0.0	0.0	0.1	0.3	0.0	0.0	0.3	0.0	0.0	0.1	0.9
44.0 +	6.6	0.6	2.5	3.9	0.9	0.4	2.1	1.3	1.1	0.2	36.3
SAMPLE SIZE	1274	1351	1410	997	1223	879	1472	1340	1504	819	768
PERCENTILES											
5	3.00	5.10	6.90	6.10	6.50	6.00	4.70	5.20	4.50	5.30	6.50
25	6.30	7.90	11.00	12.30	11.30	8.50	8.00	8.30	8.00	7.40	11.10
50	8.80	10.50	15.00	17.30	14.30	12.50	10.80	11.10	10.80	9.40	17.30
75	13.70	14.20	21.20	23.00	19.50	16.50	14.30	14.70	14.70	13.00	69.10
95	58.10	23.40	35.80	37.10	31.40	27.20	24.30	23.40	24.30	22.40	144.50

Nutrition Canada

Table 12.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF DIETARY IRON

MG/DAY	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 6.0	30.1%	11.1%	5.5%	2.7%	5.5%	12.0%	15.0%	12.0%	19.9%	18.4%	8.1%
6.0 - 8.0	20.1	19.0	8.4	6.2	12.2	11.6	14.9	16.7	11.9	12.5	10.2
8.0 - 10.0	15.2	19.1	11.6	6.0	11.1	12.4	14.2	13.0	20.9	21.3	16.3
10.0 - 12.0	7.1	20.9	10.1	15.8	10.0	18.2	13.0	24.3	15.7	19.7	10.2
12.0 - 14.0	6.1	11.1	16.0	5.9	10.4	12.1	14.0	7.8	8.9	12.1	8.1
14.0 - 16.0	5.1	6.1	10.3	7.7	9.6	11.6	6.3	5.2	11.7	4.1	10.2
16.0 - 18.0	6.0	5.3	8.1	11.1	10.3	10.6	7.9	7.5	1.0	3.8	10.2
18.0 - 20.0	1.7	2.9	7.7	8.1	5.9	3.4	3.3	4.0	3.7	0.0	6.1
20.0 - 22.0	1.7	0.7	5.0	7.8	10.5	3.8	4.1	3.2	2.0	2.4	0.0
22.0 - 24.0	0.1	0.0	4.5	4.8	1.0	1.2	0.9	0.8	0.3	0.0	2.0
24.0 - 26.0	1.5	0.6	4.5	6.9	2.5	0.5	1.1	0.7	0.0	0.0	0.0
26.0 - 28.0	0.0	0.5	1.0	4.4	0.8	1.5	0.1	0.5	0.4	2.8	0.0
28.0 - 30.0	0.0	0.2	2.1	4.1	3.0	0.0	2.7	0.0	1.4	1.1	0.0
30.0 - 32.0	0.1	1.0	0.9	0.0	0.8	0.0	0.2	0.6	0.5	0.8	0.0
32.0 - 34.0	0.0	0.2	1.5	0.2	0.0	0.0	0.5	0.0	0.5	0.0	2.0
34.0 - 36.0	0.0	0.0	0.1	0.8	2.2	0.4	0.0	0.0	0.0	0.0	0.0
36.0 - 38.0	0.0	0.3	1.0	2.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
38.0 - 40.0	0.0	0.2	0.1	1.3	1.1	0.0	0.1	0.0	0.0	0.0	0.0
40.0 - 42.0	0.2	0.0	0.0	2.9	0.0	0.0	0.1	1.0	0.0	0.0	0.0
42.0 - 44.0	0.1	0.0	0.6	0.0	0.8	0.0	0.1	0.0	0.0	0.0	0.0
44.0 +	4.1	0.1	0.0	0.6	1.4	0.0	0.3	2.0	0.6	0.0	16.3
SAMPLE SIZE	196	241	203	138	132	113	270	195	179	113	49
PERCENTILES											
5	2.10	4.50	5.80	6.90	4.90	4.20	3.60	3.80	3.60	3.20	5.00
25	5.30	7.60	9.90	11.50	9.60	8.40	7.60	7.30	6.80	7.60	8.70
50	7.90	10.10	13.70	16.70	14.20	11.80	10.50	10.60	9.60	9.70	12.90
75	12.90	12.40	19.40	23.50	19.90	15.20	14.60	14.20	13.40	12.20	18.80
95	25.60	18.50	28.80	37.80	34.00	21.40	25.20	23.10	21.50	26.60	75.10

Nutrition Canada

Table 12.3

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF HEMOGLOBIN

G/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 9.0	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%
9.0 - 9.5	0.2	0.0	0.0	0.4	0.0	0.1	0.0	0.0	1.1	0.5	0.2
9.5 - 10.0	0.6	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.1	0.0	1.3
10.0 - 10.5	1.9	1.2	0.0	0.0	0.1	0.0	0.3	0.5	0.4	0.9	4.4
10.5 - 11.0	5.0	0.4	0.0	0.1	0.0	0.4	0.2	0.4	0.2	0.3	5.9
11.0 - 11.5	8.3	2.9	0.5	0.2	0.1	0.4	1.2	1.5	1.0	1.7	10.4
11.5 - 12.0	12.2	2.7	0.9	0.1	0.0	1.0	2.2	2.8	2.7	0.5	13.0
12.0 - 12.5	25.6	16.8	3.2	0.0	1.3	1.4	6.4	6.5	5.5	5.5	20.3
12.5 - 13.0	15.4	20.2	7.0	0.5	2.0	2.3	11.2	14.6	9.8	7.7	14.0
13.0 - 13.5	15.6	22.7	12.3	1.9	2.1	5.6	23.0	14.1	15.6	15.6	15.2
13.5 - 14.0	8.3	14.6	7.9	1.8	3.4	4.6	19.3	14.0	17.1	11.2	6.6
14.0 - 14.5	4.2	13.3	17.8	9.4	6.3	10.7	21.8	25.6	17.0	21.2	5.0
14.5 - 15.0	1.3	2.0	14.3	11.5	11.5	13.5	7.1	8.9	10.6	15.1	1.9
15.0 - 15.5	0.4	1.5	10.8	13.2	20.6	21.7	3.6	5.6	7.7	8.5	0.3
15.5 - 16.0	0.1	0.4	6.1	19.0	11.5	8.8	1.5	2.7	2.2	4.8	0.3
16.0 - 16.5	0.0	0.0	9.4	17.7	15.2	12.7	0.4	1.4	5.6	2.8	0.1
16.5 - 17.0	0.0	0.1	4.7	11.4	10.1	4.6	0.4	0.2	1.9	1.0	0.0
17.0 - 17.5	0.0	0.0	2.3	6.6	8.7	4.4	0.2	0.0	0.2	0.8	0.0
17.5 - 18.0	0.0	0.0	0.2	2.5	3.0	3.5	0.1	0.0	0.1	0.0	0.0
18.0 - 18.5	0.0	0.0	1.2	2.2	1.6	1.0	0.1	0.0	0.0	0.8	0.0
18.5 +	0.0	0.1	0.4	0.7	1.7	2.1	0.0	0.0	0.0	0.0	0.0
SAMPLE SIZE	1249	1358	1432	1016	1230	895	1498	1358	1519	834	767
PERCENTILES											
5	10.80	11.60	12.50	13.80	13.20	12.60	12.00	11.80	11.80	12.20	10.40
25	11.80	12.50	13.60	14.80	14.80	14.40	13.00	12.80	13.00	13.20	11.60
50	12.40	13.00	14.40	15.70	15.60	15.10	13.60	13.80	13.80	14.10	12.20
75	13.00	13.80	15.40	16.40	16.50	16.00	14.20	14.30	14.60	14.80	13.00
95	14.00	14.40	16.80	17.60	17.60	17.70	15.00	15.40	16.20	16.00	14.20

Nutrition Canada

Table 12.4

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF HEMOGLOBIN

G/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 9.0	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%
9.0 - 9.5	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.2	0.0	0.0	6.0
9.5 - 10.0	0.8	0.0	0.2	0.0	0.0	0.0	0.2	0.8	0.0	1.4	2.0
10.0 - 10.5	2.5	0.0	0.0	0.0	0.0	0.0	0.6	0.2	2.9	0.2	4.0
10.5 - 11.0	5.1	0.6	0.0	0.0	0.9	0.0	0.3	0.5	2.3	1.2	2.0
11.0 - 11.5	14.5	2.0	0.5	0.0	0.0	0.8	3.5	4.2	1.0	1.6	8.0
11.5 - 12.0	3.7	2.8	1.5	0.5	0.0	0.0	1.2	3.1	2.9	4.2	14.0
12.0 - 12.5	15.4	18.3	5.7	0.0	0.9	3.4	10.0	12.6	7.6	6.2	22.0
12.5 - 13.0	13.9	23.9	7.9	0.0	0.7	1.1	15.1	10.2	6.2	4.4	20.0
13.0 - 13.5	17.3	17.7	19.6	2.0	1.7	5.2	22.0	18.3	13.5	14.1	6.0
13.5 - 14.0	11.8	10.8	15.6	3.2	1.0	3.4	16.7	15.3	16.4	9.5	6.0
14.0 - 14.5	11.0	14.4	22.4	9.7	5.0	10.1	18.5	18.3	15.2	13.2	8.0
14.5 - 15.0	0.7	5.5	8.8	15.2	12.4	10.7	7.8	7.2	8.5	10.1	0.0
15.0 - 15.5	2.4	1.6	9.6	15.2	17.6	17.5	1.7	5.2	10.8	13.6	0.0
15.5 - 16.0	0.0	1.8	4.0	13.1	13.9	7.3	1.0	1.7	6.2	8.0	2.0
16.0 - 16.5	0.0	0.0	2.2	17.1	12.5	13.3	0.0	0.2	3.3	6.5	0.0
16.5 - 17.0	0.0	0.0	0.2	11.6	9.7	8.7	0.0	0.7	0.2	0.9	0.0
17.0 - 17.5	0.0	0.0	0.4	6.4	10.9	5.7	0.0	0.0	1.4	2.7	0.0
17.5 - 18.0	0.0	0.0	0.1	2.2	8.0	7.2	0.0	0.0	0.0	1.5	0.0
18.0 - 18.5	0.0	0.0	0.6	2.4	4.0	1.9	0.0	0.0	0.8	0.0	0.0
18.5 +	0.0	0.0	0.0	0.6	0.0	3.0	0.0	0.0	0.0	0.0	0.0
SAMPLE SIZE	193	235	196	134	128	114	260	191	173	114	50
PERCENTILES											
5	10.80	11.80	12.30	13.60	13.60	12.50	11.40	11.00	10.80	11.80	9.40
25	11.70	12.60	13.20	14.80	15.00	14.50	12.80	12.60	13.00	13.20	11.50
50	12.60	13.00	13.90	15.60	15.60	15.40	13.40	13.40	13.80	14.20	12.20
75	13.60	13.80	14.60	16.40	16.80	16.60	14.10	14.10	14.80	15.20	12.80
95	14.20	14.80	15.80	17.80	17.90	17.80	14.80	15.00	16.20	16.60	14.00

Nutrition Canada

Table 12.5

NATIONAL SURVEY
CLASSIFICATION OF HEMOGLOBIN VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.6	0.0	0.1	0.8	0.1	1.2	0.0	0.1	2.0	0.0	0.4
	M[b]	2.5	4.8	4.9	4.3	10.7	13.4	2.4	4.1	5.1	2.0	8.0
	N[c]	445	475	513	374	412	269	502	481	502	271	275
URBAN	H	0.0	0.7	0.5	0.0	0.5	4.2	0.0	0.0	1.5	0.9	0.3
	M	6.6	2.5	5.1	7.6	11.0	17.3	2.9	12.2	7.0	3.6	6.9
	N	437	484	506	333	447	319	549	455	512	311	290
RURAL	H	0.6	0.2	0.7	2.7	0.6	2.6	0.2	1.7	0.8	2.0	0.0
	M	3.7	3.6	6.3	5.2	10.7	19.6	2.8	7.4	6.0	8.0	3.0
	N	367	399	413	309	371	307	447	422	505	252	202
SUMMER-FALL	H	0.3	0.5	0.4	1.6	0.3	1.9	0.0	0.5	0.4	0.5	0.3
	M	2.0	2.8	4.8	3.9	9.1	13.7	1.8	7.8	4.1	4.9	6.1
	N	630	692	672	463	576	465	737	636	736	426	362
WINTER-SPRING	H	0.6	0.0	0.3	0.7	0.4	2.9	0.1	0.4	2.7	1.1	0.2
	M	5.9	4.9	6.0	6.5	12.5	19.4	3.6	5.9	7.5	3.3	6.4
	N	619	666	760	553	654	430	761	722	783	408	405
TOTAL	H	0.5	0.2	0.4	1.1	0.3	2.4	0.1	0.5	1.5	0.8	0.3
	M	3.9	3.9	5.4	5.3	10.8	16.6	2.6	6.8	5.8	4.1	6.3
	N	1249	1358	1432	1016	1230	895	1498	1358	1519	834	767

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 12.6

INDIAN SURVEY
CLASSIFICATION OF HEMOGLOBIN VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.3	0.0	1.1	0.0	0.0	1.4	0.8	1.6	0.0	1.4	0.0
	M [b]	7.9	3.5	8.6	6.5	6.7	17.6	3.9	14.8	10.2	10.3	13.3
	N [c]	98	117	120	77	71	60	139	99	97	56	15
REMOTE	H	0.0	0.0	0.4	1.0	2.4	0.0	1.0	1.7	0.0	1.5	0.0
	M	4.6	0.5	17.4	8.8	3.6	10.9	6.3	9.3	15.0	3.9	11.4
	N	95	118	76	57	57	54	121	92	76	58	35
ALGONKIAN	H	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0
	M	10.8	4.0	20.4	6.3	17.3	23.0	4.7	11.9	7.4	18.1	21.4
	N	54	60	38	30	33	16	55	53	34	20	14
IROQUOIAN	H	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	4.9	0.0
	M	0.0	2.4	16.4	2.0	0.0	13.6	0.0	0.0	9.7	0.0	0.0
	N	20	33	37	17	18	19	38	25	32	14	3
PLAINS	H	0.0	0.0	0.0	0.0	2.0	0.0	1.1	1.6	0.0	0.0	0.0
	M	0.8	0.0	5.1	5.1	0.0	11.3	5.1	16.6	14.3	9.8	5.0
	N	46	66	35	25	42	43	65	37	57	32	20
PLATEAU	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	12.2	0.0	11.5	10.5	12.9	25.4	2.7	18.5	29.5	4.9	25.0
	N	43	30	37	29	15	13	48	33	24	17	8
PACIFIC	H	0.0	0.0	6.8	0.0	0.0	0.0	3.7	6.1	0.0	4.8	0.0
	M	21.8	7.3	13.1	14.0	9.9	18.3	11.9	10.2	5.5	0.0	0.0
	N	23	37	39	26	20	18	41	34	19	21	3
TOTAL [e]	H	0.2	0.0	0.8	0.5	1.0	0.9	0.9	1.6	0.0	1.4	0.0
	M	6.2	1.8	12.8	7.7	5.5	14.9	5.1	12.0	11.9	7.9	12.0
	N	193	235	196	134	128	114	260	191	173	114	50
NATIONAL SURVEY TOTAL	H	0.5	0.2	0.4	1.1	0.3	2.4	0.1	0.5	1.5	0.8	0.3
	M	3.9	3.9	5.4	5.3	10.8	16.6	2.6	6.8	5.8	4.1	6.3
	N	1249	1358	1432	1016	1230	895	1498	1358	1519	834	767

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 12.7

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF MCHC

%	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 20.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
20.0 - 21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21.0 - 22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
22.0 - 23.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23.0 - 24.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24.0 - 25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
25.0 - 26.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
26.0 - 27.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2
27.0 - 28.0	0.9	0.1	0.0	0.4	0.0	0.1	0.0	0.0	1.1	0.3	0.1
28.0 - 29.0	1.3	0.1	0.4	0.2	0.1	0.6	0.5	0.3	0.8	0.2	1.0
29.0 - 30.0	1.3	0.2	0.6	0.3	0.4	1.5	1.2	3.9	1.5	1.6	0.9
30.0 - 31.0	5.5	2.8	2.4	2.6	2.0	7.9	4.8	5.9	6.1	5.4	7.8
31.0 - 32.0	11.0	10.1	8.2	8.4	8.2	13.2	12.8	14.3	13.4	13.9	12.8
32.0 - 33.0	19.1	21.1	15.4	14.7	21.8	14.4	18.2	22.2	23.7	25.9	19.3
33.0 - 34.0	20.8	27.1	28.7	23.4	22.6	23.3	26.5	25.7	23.2	27.2	23.3
34.0 - 35.0	15.8	19.7	21.0	22.4	18.3	22.4	21.6	16.2	18.7	13.8	18.3
35.0 - 36.0	12.4	11.5	17.4	19.6	16.5	9.6	9.6	7.9	8.3	7.7	10.9
36.0 - 37.0	6.8	4.5	3.2	4.8	7.0	3.9	2.5	2.4	1.8	2.1	1.7
37.0 - 38.0	2.5	0.8	1.5	2.3	0.9	1.2	1.1	0.4	0.6	0.8	1.7
38.0 - 39.0	0.8	0.3	0.2	0.3	0.0	0.1	0.2	0.0	0.1	0.5	0.4
39.0 +	1.0	1.0	0.4	0.0	1.6	0.7	0.3	0.3	0.0	0.1	0.5
SAMPLE SIZE	1215	1337	1400	995	1209	875	1461	1333	1487	816	748
PERCENTILES											
5	30.20	31.20	31.20	31.30	31.20	30.40	30.60	30.20	30.20	30.60	30.20
25	32.30	32.50	32.70	32.90	32.60	32.00	32.30	32.00	32.00	32.10	32.00
50	33.30	33.50	33.60	33.90	33.70	33.30	33.30	33.00	33.10	33.00	33.30
75	34.80	34.50	34.80	35.10	35.00	34.40	34.30	34.00	34.00	34.00	34.20
95	36.60	36.20	36.00	36.50	36.40	36.00	35.80	35.50	35.60	35.60	35.80

Nutrition Canada

Table 12.8

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF MCHC

%	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 20.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
20.0 - 21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21.0 - 22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
22.0 - 23.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23.0 - 24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24.0 - 25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25.0 - 26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26.0 - 27.0	0.0	0.0	0.2	0.0	0.0	0.0	0.4	0.2	0.0	0.8	0.0
27.0 - 28.0	0.8	0.0	0.3	0.0	0.0	0.0	0.5	0.5	0.0	0.4	2.0
28.0 - 29.0	0.6	0.0	0.8	0.0	0.6	0.0	0.5	0.0	0.5	1.6	6.0
29.0 - 30.0	2.5	0.2	0.2	0.0	1.4	3.2	1.6	3.5	2.5	1.9	8.0
30.0 - 31.0	11.4	2.5	2.9	1.0	2.4	4.6	6.8	5.8	12.2	5.6	2.0
31.0 - 32.0	11.4	7.2	12.0	11.9	8.7	9.8	12.8	14.1	13.5	14.1	12.0
32.0 - 33.0	16.5	23.2	14.5	22.6	24.8	25.4	19.0	22.9	21.2	20.4	18.0
33.0 - 34.0	21.9	21.8	31.8	24.4	21.7	21.7	22.9	22.4	20.5	21.5	20.0
34.0 - 35.0	19.7	16.4	15.4	25.8	24.7	20.3	19.7	20.5	16.8	19.8	18.0
35.0 - 36.0	13.6	20.5	13.0	11.0	11.9	12.8	8.9	5.9	9.4	11.3	8.0
36.0 - 37.0	0.4	5.5	7.6	2.6	2.1	1.8	4.6	1.8	1.8	0.0	4.0
37.0 - 38.0	0.6	2.2	0.1	0.0	0.0	0.0	1.7	1.3	0.2	0.5	0.0
38.0 - 39.0	0.0	0.0	0.0	0.3	0.8	0.0	0.0	0.0	0.3	0.0	0.0
39.0 +	0.0	0.0	0.7	0.0	0.3	0.0	0.0	0.0	0.5	0.9	2.0
SAMPLE SIZE	190	228	188	129	127	111	250	188	168	112	50
PERCENTILES											
5	30.00	31.50	31.00	31.40	31.00	30.60	30.40	30.00	30.20	29.70	28.20
25	31.70	32.60	32.60	32.40	32.40	32.10	32.00	32.00	31.80	31.90	31.70
50	33.10	33.80	33.50	33.40	33.60	33.30	33.30	33.00	32.90	33.10	33.10
75	34.40	35.10	34.70	34.50	34.40	34.20	34.50	34.10	34.20	34.40	34.10
95	35.70	36.40	36.50	35.70	35.40	35.30	36.00	35.20	35.60	35.30	36.50

Nutrition Canada

Table 12.9

NATIONAL SURVEY
CLASSIFICATION OF MCHC VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	4.9	0.2	1.1	1.3	0.2	3.0	1.5	4.5	3.6	0.3	2.6
	M[b]	14.4	13.5	8.1	10.0	9.9	29.9	17.3	23.6	20.0	26.1	23.7
	N[c]	431	470	499	366	405	264	488	472	489	265	266
URBAN	H	3.3	1.4	1.1	1.0	0.5	1.7	3.6	4.1	2.8	4.0	2.8
	M	23.0	20.4	19.4	14.4	14.7	22.7	21.6	26.5	28.2	20.1	26.1
	N	427	477	495	327	438	311	533	448	502	300	284
RURAL	H	3.1	0.7	1.4	0.8	1.1	3.1	1.4	3.7	4.6	4.1	3.0
	M	14.9	14.1	12.9	18.5	16.2	16.1	19.7	25.4	20.1	17.8	14.6
	N	357	390	406	302	366	300	440	413	496	251	198
SUMMER-FALL	H	1.6	0.7	1.6	1.3	0.2	1.7	0.4	6.2	1.3	1.2	1.7
	M	22.4	11.4	8.7	16.7	9.3	16.4	17.4	25.3	23.7	24.2	17.5
	N	608	681	658	454	566	456	716	624	722	418	354
WINTER-SPRING	H	6.2	0.6	0.8	0.9	1.0	3.7	3.7	2.3	6.2	3.3	3.8
	M	11.3	19.3	15.8	10.2	16.7	30.2	20.7	24.1	20.1	20.4	26.4
	N	607	656	742	541	643	419	745	709	765	398	394
TOTAL	H	3.9	0.6	1.2	1.1	0.6	2.7	2.0	4.2	3.7	2.3	2.8
	M	16.8	15.3	12.1	13.2	13.0	23.3	18.9	24.7	21.9	22.3	22.2
	N	1215	1337	1400	995	1209	875	1461	1333	1487	816	748

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 12.10

INDIAN SURVEY
CLASSIFICATION OF MCHC VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	6.6	0.8	2.6	0.0	3.5	5.4	3.4	2.6	1.8	7.2	13.3
	M [b]	33.4	12.7	21.6	7.5	12.7	12.0	20.7	22.6	33.4	17.3	6.7
	N [c]	98	115	117	76	71	59	137	98	93	55	15
REMOTE	H	1.6	0.0	0.5	0.0	0.0	0.0	2.9	7.0	5.6	2.6	17.1
	M	16.4	8.9	9.0	26.0	13.0	24.0	27.3	23.3	17.0	37.0	20.0
	N	92	113	71	53	56	52	113	90	75	57	35
ALGONKIAN	H	9.8	1.3	1.1	0.0	7.6	15.4	0.0	0.9	1.7	13.1	14.3
	M	23.8	23.6	30.8	35.3	14.6	9.5	35.3	36.0	44.1	22.1	14.3
	N	54	58	35	28	33	16	54	51	31	20	14
IROQUOIAN	H	0.0	0.0	7.1	0.0	0.0	0.0	10.5	0.0	3.9	5.4	0.0
	M	14.7	15.2	21.3	10.1	16.4	10.2	15.0	18.1	32.4	9.8	0.0
	N	20	33	36	17	18	19	38	25	32	13	3
PLAINS	H	1.5	0.0	0.0	0.0	1.4	1.0	2.4	4.5	3.6	1.4	10.0
	M	20.5	4.3	7.9	9.7	11.5	15.4	13.8	10.4	20.4	26.4	15.0
	N	46	63	34	24	42	42	62	36	57	32	20
PLATEAU	H	21.2	1.4	0.0	0.0	0.0	0.0	0.0	11.7	0.0	10.7	50.0
	M	28.9	10.4	9.7	14.6	26.1	31.5	32.2	45.0	35.8	30.7	25.0
	N	42	30	36	29	15	13	48	33	24	17	8
PACIFIC	H	0.8	0.0	4.6	0.0	0.0	0.0	8.9	15.5	4.5	5.0	0.0
	M	49.0	11.0	17.4	6.9	5.7	45.5	41.6	25.3	19.8	39.3	33.3
	N	22	36	37	24	19	16	36	34	17	20	3
TOTAL [e]	H	4.0	0.3	1.6	0.0	2.1	3.2	3.2	4.9	3.1	5.4	16.0
	M	24.4	10.6	15.6	16.8	12.8	16.8	23.8	23.0	27.7	24.8	16.0
	N	190	228	188	129	127	111	250	188	168	112	50
NATIONAL SURVEY TOTAL	H	3.9	0.6	1.2	1.1	0.6	2.7	2.0	4.2	3.7	2.3	2.8
	M	16.8	15.3	12.1	13.2	13.0	23.3	18.9	24.7	21.9	22.3	22.2
	N	1215	1337	1400	995	1209	875	1461	1333	1487	816	748

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 12.11

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF TRANSFERRIN SATURATION

%	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 10.0	1.7%	0.3%	0.1%	0.4%	0.2%	0.5%	1.0%	1.6%	2.3%	1.2%	0.6%
10.0 - 12.0	2.8	1.9	0.1	1.1	0.6	0.9	0.9	1.2	1.3	0.3	0.9
12.0 - 14.0	4.2	2.6	1.0	1.0	1.1	0.2	3.0	2.8	1.6	0.5	2.8
14.0 - 16.0	4.0	6.4	2.0	0.7	0.3	5.4	5.9	4.7	2.9	0.2	4.5
16.0 - 18.0	8.5	5.4	4.9	3.7	3.5	2.7	7.4	8.0	4.6	2.9	6.2
18.0 - 20.0	9.2	5.2	6.3	7.2	2.8	5.0	9.4	8.3	8.9	7.9	9.8
20.0 - 22.0	15.0	11.9	10.9	6.3	9.0	5.2	12.2	12.5	12.2	13.0	10.3
22.0 - 24.0	9.8	12.3	9.9	9.6	12.0	8.9	12.7	9.3	12.0	12.5	10.2
24.0 - 26.0	7.5	13.9	12.6	8.5	11.8	9.3	12.2	9.1	8.8	13.7	9.5
26.0 - 28.0	11.5	13.2	10.9	14.0	11.6	8.6	9.2	10.6	12.8	9.6	9.2
28.0 - 30.0	11.1	6.0	12.1	8.9	9.3	8.0	5.8	6.7	9.9	12.6	9.5
30.0 - 32.0	5.5	6.9	7.9	7.8	11.9	8.4	3.5	6.5	4.7	7.3	4.6
32.0 - 34.0	1.8	5.3	4.6	7.2	5.1	9.8	5.2	2.9	4.3	8.0	3.8
34.0 - 36.0	3.6	3.0	4.9	5.9	4.4	5.5	3.4	3.0	3.1	2.5	4.3
36.0 - 38.0	2.0	1.6	2.9	3.3	3.8	4.1	2.0	2.9	3.7	2.1	2.8
38.0 - 40.0	0.4	1.3	3.3	2.7	2.4	7.1	1.8	2.4	1.1	1.8	2.1
40.0 - 42.0	0.3	0.3	1.1	1.4	1.9	1.4	0.5	3.7	1.9	2.2	1.3
42.0 - 44.0	0.2	0.8	1.3	2.4	4.2	2.0	1.3	1.3	0.5	0.0	1.6
44.0 - 46.0	0.0	0.2	0.5	0.5	1.3	1.6	0.3	0.4	0.5	0.0	0.8
46.0 - 48.0	0.0	0.4	0.5	0.8	0.4	0.9	0.1	0.6	0.9	0.0	1.2
48.0 +	0.1	0.0	1.3	5.6	1.5	3.4	1.1	0.2	1.2	0.7	3.0
SAMPLE SIZE	535	1228	1394	1008	1209	898	1475	1332	1490	810	733
PERCENTILES											
5	12.00	14.00	16.00	16.00	17.00	15.00	13.00	13.00	13.00	17.00	14.00
25	19.00	20.00	21.00	22.00	23.00	22.00	19.00	19.00	20.00	21.00	19.00
50	22.00	24.00	26.00	27.00	27.00	28.00	23.00	24.00	24.00	25.00	24.00
75	28.00	28.00	31.00	33.00	32.00	34.00	28.00	29.00	29.00	29.00	30.00
95	35.00	35.00	39.00	50.00	43.00	45.00	38.00	40.00	40.00	37.00	44.00

Nutrition Canada

Table 12.12

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF TRANSFERRIN SATURATION

%	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 10.0	6.2%	0.3%	0.5%	0.0%	0.0%	0.0%	3.9%	3.8%	3.7%	2.5%	4.1%
10.0 - 12.0	2.6	3.8	1.1	0.1	0.0	0.0	2.9	9.2	7.5	1.0	4.1
12.0 - 14.0	10.6	7.5	5.9	2.4	3.3	0.4	5.7	9.7	4.2	7.8	14.5
14.0 - 16.0	14.0	11.8	12.2	1.2	6.0	4.0	11.3	11.3	5.5	9.7	14.5
16.0 - 18.0	11.4	11.2	4.9	7.9	9.7	6.8	9.6	9.5	10.8	3.6	6.2
18.0 - 20.0	20.6	10.4	6.4	8.5	5.8	7.8	11.3	10.8	7.3	11.7	12.5
20.0 - 22.0	3.0	10.7	19.0	12.4	6.6	6.6	14.3	11.2	13.6	17.8	4.1
22.0 - 24.0	9.9	13.2	12.7	5.7	7.5	8.7	9.4	8.1	8.1	9.9	2.0
24.0 - 26.0	5.4	8.6	5.8	10.9	8.7	8.9	7.2	4.1	13.7	10.1	12.5
26.0 - 28.0	3.8	7.9	8.3	14.5	12.2	14.7	5.3	9.5	4.7	14.4	6.2
28.0 - 30.0	3.5	4.0	4.5	7.1	10.4	11.3	4.4	1.8	8.2	2.8	2.0
30.0 - 32.0	0.6	2.7	8.6	10.1	5.3	3.9	3.5	1.6	2.9	3.8	2.0
32.0 - 34.0	0.7	4.0	1.6	4.8	6.8	5.0	1.3	2.0	0.6	1.0	2.0
34.0 - 36.0	0.8	1.3	3.0	0.0	1.9	6.8	1.4	1.3	0.7	1.4	2.0
36.0 - 38.0	0.1	0.0	1.7	2.1	1.2	4.0	1.3	1.2	0.8	1.0	0.0
38.0 - 40.0	5.1	0.0	1.6	4.8	4.7	6.6	3.2	0.4	3.8	0.4	0.0
40.0 - 42.0	0.6	0.0	0.0	2.1	4.6	0.7	0.9	0.7	0.8	0.0	2.0
42.0 - 44.0	0.0	0.7	0.0	4.1	1.1	0.0	2.0	0.0	0.0	0.3	2.0
44.0 - 46.0	0.0	0.4	1.0	0.0	0.0	0.0	0.0	0.6	0.4	0.0	0.0
46.0 - 48.0	0.0	0.4	0.3	0.5	0.0	0.4	0.0	0.0	1.1	0.0	0.0
48.0 +	0.0	0.0	0.0	0.0	3.4	2.6	0.2	2.0	0.4	0.0	6.2
SAMPLE SIZE	109	226	197	135	131	115	252	192	175	111	48
PERCENTILES											
5	7.00	12.00	13.00	16.00	14.00	16.00	10.00	10.00	10.00	12.00	11.00
25	14.00	16.00	18.00	20.00	19.00	21.00	16.00	14.00	16.00	18.00	14.00
50	18.00	20.00	21.00	26.00	26.00	27.00	20.00	18.00	21.00	21.00	18.00
75	23.00	25.00	27.00	30.00	31.00	32.00	25.00	24.00	26.00	26.00	25.00
95	38.00	32.00	35.00	41.00	41.00	39.00	38.00	36.00	38.00	31.00	49.00

Nutrition Canada

Table 12.13

NATIONAL SURVEY
CLASSIFICATION OF TRANSFERRIN SATURATION VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	14.4	12.4	2.3	3.9	1.0	13.1	10.8	12.1	9.1	1.8	7.1
	M[b]	17.6	19.6	16.4	14.8	11.0	4.5	23.0	21.3	21.4	12.6	25.9
	N[c]	174	431	497	375	412	264	489	474	497	259	255
URBAN	H	14.2	9.7	5.0	2.6	1.4	6.3	12.3	9.4	5.9	2.5	12.3
	M	31.2	14.8	14.4	10.1	12.2	11.2	17.8	22.5	21.7	12.4	21.1
	N	200	440	492	329	428	322	538	448	495	305	284
RURAL	H	9.9	11.2	3.7	3.5	5.1	1.0	10.3	8.3	8.6	3.4	6.7
	M	30.2	17.5	15.5	16.8	11.3	17.0	21.8	18.3	17.1	22.8	14.9
	N	161	357	405	304	369	312	448	410	498	246	194
SUMMER-FALL	H	14.8	13.7	3.0	3.5	3.8	3.4	11.2	13.7	7.1	2.7	10.0
	M	16.9	15.8	14.4	20.2	12.7	12.1	16.8	21.2	21.2	16.9	20.3
	N	275	595	650	452	565	469	716	613	709	404	340
WINTER-SPRING	H	11.4	9.5	3.7	3.5	0.8	10.9	10.8	7.5	9.5	2.2	8.1
	M	32.2	19.5	17.0	9.2	10.1	9.1	26.2	20.7	19.5	14.1	21.9
	N	260	633	744	556	644	429	759	719	781	406	393
TOTAL	H	12.9	11.4	3.3	3.5	2.3	7.1	11.0	10.6	8.2	2.5	9.0
	M	25.4	17.8	15.7	14.2	11.4	10.6	21.4	20.9	20.4	15.5	21.1
	N	535	1228	1394	1008	1209	898	1475	1332	1490	810	733

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 12.14

INDIAN SURVEY
CLASSIFICATION OF TRANSFERRIN SATURATION VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	34.1	20.3	13.9	0.7	7.5	5.4	28.7	31.2	18.3	30.2	46.7
	M [b]	26.3	27.2	15.7	22.0	20.5	12.3	29.5	31.1	25.9	25.7	20.0
	N [c]	44	105	117	74	71	61	134	99	95	56	15
REMOTE	H	33.3	26.0	26.6	6.9	12.3	3.1	18.5	37.3	26.6	6.5	33.3
	M	36.9	28.1	26.0	22.2	11.1	26.7	26.7	21.7	24.7	17.1	21.2
	N	65	121	80	61	60	54	118	93	80	55	33
ALGONKIAN	H	42.3	17.9	14.8	0.0	20.7	7.8	20.5	37.1	27.0	40.8	28.6
	M	24.7	38.7	24.0	33.5	15.3	16.9	29.5	31.7	18.8	19.1	7.1
	N	34	62	45	32	37	18	56	57	40	20	14
IROQUOIAN	H	11.2	14.5	13.2	2.2	0.0	5.1	17.4	16.2	15.1	10.9	0.0
	M	10.0	6.2	19.8	34.7	4.1	12.3	29.7	41.6	27.0	21.5	66.7
	N	11	30	36	16	18	19	38	24	31	14	3
PLAINS	H	36.1	26.3	25.7	0.0	6.9	0.0	23.9	48.0	23.7	19.6	44.4
	M	37.6	26.8	14.5	13.1	19.6	23.0	32.3	17.8	27.4	20.0	27.8
	N	31	61	35	25	40	42	64	35	55	30	18
PLATEAU	H	34.2	21.5	23.0	21.6	4.5	13.5	32.0	25.1	25.7	17.5	50.0
	M	26.3	13.1	25.6	15.7	24.6	11.9	22.3	37.9	24.0	40.7	12.5
	N	15	30	35	29	15	13	44	32	24	17	8
PACIFIC	H	27.0	33.8	21.7	6.9	13.5	14.2	40.7	19.4	9.7	18.4	33.3
	M	24.2	35.0	22.0	22.7	17.6	16.3	6.6	22.5	30.6	24.2	0.0
	N	13	35	36	26	21	18	38	35	18	20	3
TOTAL [e]	H	33.7	23.5	19.8	3.8	9.4	4.5	24.0	34.3	21.2	21.2	37.5
	M	32.4	27.7	20.5	22.1	16.8	18.1	28.2	26.3	25.5	22.5	20.8
	N	109	226	197	135	131	115	252	192	175	111	48
NATIONAL SURVEY TOTAL	H	12.9	11.4	3.3	3.5	2.3	7.1	11.0	10.6	8.2	2.5	9.0
	M	25.4	17.8	15.7	14.2	11.4	10.6	21.4	20.9	20.4	15.5	21.1
	N	535	1228	1394	1008	1209	898	1475	1332	1490	810	733

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 12.15

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF HEMATOCRIT

%	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 29.0	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.6%
29.0 - 30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
30.0 - 31.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.7
31.0 - 32.0	0.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.1
32.0 - 33.0	2.1	0.1	0.0	0.0	0.0	0.3	0.2	0.4	0.1	0.5	3.1
33.0 - 34.0	3.8	0.0	0.0	0.4	0.0	0.0	0.1	1.0	1.0	1.2	5.3
34.0 - 35.0	7.5	2.5	0.0	0.0	0.1	0.5	0.8	0.5	0.2	0.8	8.4
35.0 - 36.0	12.5	2.5	0.8	0.4	0.0	1.1	0.6	0.6	0.8	1.5	11.6
36.0 - 37.0	15.2	5.4	0.6	0.0	0.2	0.3	0.6	1.0	0.7	0.9	9.6
37.0 - 38.0	16.6	9.7	1.5	0.3	1.3	1.1	4.1	2.4	5.6	4.1	12.5
38.0 - 39.0	15.2	22.3	7.1	0.0	2.3	0.9	8.6	11.3	6.7	3.6	14.5
39.0 - 40.0	9.9	13.7	6.3	0.1	0.7	1.5	13.8	8.1	6.8	7.6	10.0
40.0 - 41.0	7.6	17.0	9.6	0.8	1.5	4.1	19.5	11.0	13.4	6.8	9.0
41.0 - 42.0	3.9	10.4	8.9	2.5	2.7	3.1	12.5	9.8	7.8	9.6	4.7
42.0 - 43.0	2.0	9.0	11.8	3.9	2.8	8.3	14.7	16.0	18.7	11.8	2.6
43.0 - 44.0	0.9	2.4	10.4	6.6	8.4	7.5	13.0	16.7	9.5	11.7	2.1
44.0 - 45.0	0.3	1.4	7.8	9.2	7.9	13.5	5.1	10.1	8.9	15.3	1.1
45.0 - 46.0	0.0	0.2	8.2	17.7	9.5	10.0	3.9	5.4	4.5	8.5	0.3
46.0 - 47.0	0.0	0.4	6.7	10.5	13.4	5.7	0.5	1.4	4.0	3.9	0.2
47.0 - 48.0	0.1	0.0	6.5	15.0	14.9	9.0	0.5	1.3	2.9	2.9	0.1
48.0 +	0.6	0.1	13.2	31.7	33.4	32.2	0.6	1.9	7.0	8.3	0.2
SAMPLE SIZE	1233	1351	1419	1002	1220	889	1477	1348	1503	827	754
PERCENTILES											
5	33.00	35.00	38.00	42.00	40.00	39.00	37.00	37.00	37.00	36.00	32.00
25	35.00	38.00	40.00	45.00	44.00	43.00	39.00	39.00	40.00	40.00	35.00
50	37.00	39.00	43.00	46.00	46.00	45.00	41.00	42.00	42.00	43.00	37.00
75	39.00	40.00	46.00	48.00	48.00	48.00	42.00	43.00	44.00	44.00	39.00
95	41.00	42.00	49.00	51.00	51.00	53.00	45.00	45.00	48.00	48.00	42.00

Nutrition Canada

Table 12.16

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF HEMATOCRIT

%	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 29.0	0.1%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.6%	0.0%	0.4%	2.0%
29.0 - 30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30.0 - 31.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	2.0
31.0 - 32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
32.0 - 33.0	0.3	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.3	0.0	6.0
33.0 - 34.0	1.8	0.8	0.0	0.0	0.0	0.0	0.7	0.7	0.5	0.2	4.0
34.0 - 35.0	4.0	2.1	0.3	0.0	0.9	1.6	1.1	0.2	1.3	0.5	6.0
35.0 - 36.0	8.2	3.0	0.6	0.0	0.2	0.0	2.3	2.7	2.6	1.2	12.0
36.0 - 37.0	10.0	6.2	0.1	0.5	0.0	0.0	1.9	5.1	2.9	4.2	6.0
37.0 - 38.0	11.1	14.3	5.8	0.0	0.2	0.0	4.5	4.0	6.1	3.0	14.0
38.0 - 39.0	17.3	17.1	10.5	0.4	0.9	1.9	8.0	6.7	6.9	2.9	14.0
39.0 - 40.0	17.1	22.7	9.3	0.0	1.0	0.5	11.3	10.7	4.9	5.8	16.0
40.0 - 41.0	12.0	14.0	16.7	0.8	0.4	2.8	28.9	15.4	9.3	7.2	4.0
41.0 - 42.0	5.9	8.2	10.7	2.1	0.9	0.0	17.1	14.8	4.8	3.1	6.0
42.0 - 43.0	4.4	4.3	11.1	3.4	3.6	6.6	9.5	14.4	12.6	14.2	4.0
43.0 - 44.0	6.6	3.6	13.2	6.8	5.7	7.3	4.8	11.6	11.7	16.0	4.0
44.0 - 45.0	0.0	2.8	3.7	7.1	3.4	8.1	5.0	3.5	9.1	4.3	0.0
45.0 - 46.0	0.0	0.4	6.0	11.2	11.4	5.8	2.1	3.2	11.3	17.0	0.0
46.0 - 47.0	0.0	0.0	5.3	13.7	12.0	14.9	1.2	3.7	3.8	7.4	0.0
47.0 - 48.0	0.0	0.0	2.6	25.5	14.5	11.1	0.2	0.6	4.3	1.0	0.0
48.0 +	0.0	0.0	3.2	28.0	43.9	38.8	0.0	1.1	6.5	10.6	0.0
SAMPLE SIZE	191	235	195	133	132	113	254	193	174	112	50
PERCENTILES											
5	34.00	35.00	37.00	42.00	41.00	40.00	36.00	36.00	35.00	36.00	32.00
25	36.00	37.00	39.00	45.00	45.00	44.00	39.00	39.00	39.00	40.00	35.00
50	38.00	39.00	41.00	47.00	47.00	47.00	40.00	41.00	42.00	43.00	37.00
75	40.00	40.00	43.00	48.00	49.00	49.00	41.00	42.00	45.00	45.00	39.00
95	43.00	43.00	47.00	53.00	54.00	53.00	44.00	46.00	48.00	49.00	42.00

Nutrition Canada

Table 12.17

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM IRON

MCG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10 - 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 - 30	0.0	0.3	0.0	0.4	0.1	0.1	0.0	0.1	0.1	0.0	0.0
30 - 40	3.2	1.7	0.0	0.0	0.2	0.6	0.3	1.7	0.3	0.7	0.5
40 - 50	4.6	3.6	0.9	3.2	2.2	0.8	4.1	3.7	4.4	1.8	0.2
50 - 60	6.3	6.1	2.7	3.5	3.1	9.7	6.2	5.6	6.0	2.4	1.5
60 - 70	8.1	8.7	7.7	7.3	6.7	6.6	9.7	10.1	8.7	10.7	3.2
70 - 80	16.8	15.4	11.8	9.8	12.5	11.6	14.1	15.4	17.6	23.3	6.6
80 - 90	18.0	15.6	12.6	18.3	16.7	13.0	17.6	13.9	17.5	15.9	11.5
90 - 100	13.3	15.5	19.1	14.8	14.6	13.0	18.5	10.1	17.2	13.4	11.1
100 - 110	9.8	14.6	14.3	12.4	13.8	12.5	9.5	12.5	8.3	12.9	12.1
110 - 120	10.8	7.7	9.4	8.4	10.5	8.8	7.0	7.5	6.5	9.1	10.7
120 - 130	5.1	4.1	9.8	4.8	6.0	11.4	3.8	6.8	4.4	3.6	10.3
130 - 140	1.2	4.0	4.0	4.0	3.4	2.4	4.0	4.0	2.4	3.1	8.0
140 - 150	0.3	1.1	2.7	3.2	3.4	3.4	1.9	3.6	1.4	1.4	6.0
150 - 160	0.0	0.4	2.1	1.3	1.7	2.1	0.6	3.2	1.4	0.0	3.8
160 - 170	0.8	0.4	0.5	0.6	1.7	1.1	0.8	0.5	1.4	0.6	3.2
170 - 180	0.4	0.0	0.8	2.8	2.0	1.0	0.1	0.2	0.5	0.0	2.8
180 - 190	0.0	0.0	0.4	2.4	0.4	0.1	0.2	0.0	0.0	0.1	1.6
190 - 200	0.5	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	1.3
200 +	0.0	0.0	0.3	1.5	0.2	0.8	0.7	0.2	1.1	0.2	4.6
SAMPLE SIZE	535	1228	1394	1008	1209	898	1475	1332	1490	810	733
PERCENTILES											
5	44.00	48.00	61.00	54.00	58.00	58.00	50.00	48.00	50.00	59.00	69.00
25	71.00	72.00	81.00	81.00	80.00	77.00	73.00	73.00	72.00	73.00	91.00
50	86.00	88.00	97.00	95.00	95.00	95.00	88.00	88.00	87.00	88.00	112.00
75	104.00	104.00	114.00	115.00	114.00	118.00	103.00	112.00	103.00	106.00	137.00
95	127.00	132.00	147.00	179.00	158.00	152.00	136.00	146.00	146.00	130.00	197.00

Nutrition Canada

Table 12.18

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM IRON

MCG/100ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55+ M	10-19 F	20-39 F	40-54 F	55+ F	PREGNANT WOMEN
0 - 10	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10 - 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 - 30	0.2	0.3	0.0	0.0	0.0	0.0	0.4	2.6	0.5	0.0	0.0
30 - 40	6.0	2.3	2.0	0.0	0.0	0.0	2.2	2.7	5.6	2.5	0.0
40 - 50	5.8	10.5	2.8	3.9	2.9	3.1	5.5	11.2	7.8	7.3	4.1
50 - 60	17.2	15.1	9.9	5.5	7.7	8.4	15.4	15.4	8.0	10.9	6.2
60 - 70	22.4	15.8	15.9	8.3	15.7	11.3	14.7	13.1	14.7	21.4	10.4
70 - 80	17.1	13.4	13.4	13.9	8.5	10.7	16.3	14.1	12.7	16.4	20.8
80 - 90	11.8	13.7	18.3	13.2	9.5	11.5	14.0	11.2	16.1	17.2	12.5
90 - 100	5.5	13.6	12.0	10.8	15.0	13.9	11.2	6.3	9.6	10.0	6.2
100 - 110	4.5	3.0	9.9	16.1	12.0	8.9	3.0	7.6	6.9	8.0	8.3
110 - 120	1.3	3.4	5.9	11.5	6.2	10.3	5.1	6.4	5.3	2.2	2.0
120 - 130	4.6	4.2	3.3	5.2	8.7	8.3	2.2	3.5	3.8	2.9	8.3
130 - 140	1.1	0.9	2.9	5.1	3.7	2.3	2.6	0.6	3.3	0.0	4.1
140 - 150	1.2	1.6	1.5	2.4	1.7	5.3	3.2	0.4	1.6	0.4	0.0
150 - 160	0.6	0.6	1.6	0.1	0.6	1.7	1.0	1.2	1.5	0.0	4.1
160 - 170	0.0	0.0	0.0	0.0	3.0	0.8	0.0	2.0	0.4	0.3	4.1
170 - 180	0.0	0.0	0.0	2.9	0.5	2.3	0.1	0.0	1.1	0.0	0.0
180 - 190	0.0	0.2	0.0	0.5	3.0	0.0	1.8	0.0	0.2	0.0	0.0
190 - 200	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
200 +	0.0	0.0	0.0	0.0	0.4	0.2	0.2	0.6	0.0	0.0	8.3
SAMPLE SIZE	109	227	197	135	131	115	252	192	175	111	48
PERCENTILES											
5	33.00	43.00	50.00	58.00	56.00	55.00	42.00	39.00	37.00	48.00	56.00
25	57.00	57.00	67.00	76.00	68.00	70.00	61.00	56.00	63.00	62.00	72.00
50	67.00	74.00	83.00	92.00	95.00	93.00	78.00	72.00	80.00	75.00	82.00
75	85.00	91.00	101.00	110.00	113.00	118.00	94.00	98.00	99.00	89.00	121.00
95	129.00	129.00	132.00	141.00	166.00	150.00	147.00	132.00	142.00	111.00	242.00

Nutrition Canada

Table 13.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF SERUM FOLATE

NG/ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0.0 - 0.5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.5 - 1.5	2.1	0.0	2.3	1.7	1.8	3.8	1.1	2.4	1.5	1.2	3.4
1.5 - 2.5	6.2	4.7	7.6	9.5	12.2	13.3	11.7	18.4	10.8	12.2	13.3
2.5 - 3.5	8.8	12.0	20.8	17.0	16.5	17.6	18.9	21.5	17.9	19.5	13.3
3.5 - 4.5	20.7	22.4	23.7	22.6	19.1	26.5	22.2	17.8	20.4	21.8	9.8
4.5 - 5.5	9.7	19.8	18.7	22.1	16.6	12.2	21.4	12.5	14.8	12.8	5.2
5.5 - 6.5	16.9	11.7	10.6	15.0	8.5	11.0	11.3	6.9	8.9	8.0	4.5
6.5 - 7.5	8.0	9.6	8.0	5.0	8.5	4.9	4.4	5.6	10.3	10.6	3.8
7.5 - 8.5	7.2	4.2	2.0	2.4	5.5	3.3	2.7	3.4	3.8	5.0	1.8
8.5 - 9.5	6.4	2.5	2.4	0.4	3.3	1.4	1.5	2.1	1.7	3.5	1.8
9.5 - 10.5	2.1	2.2	1.1	1.0	2.2	2.6	0.9	1.4	3.1	1.5	1.4
10.5 - 11.5	7.0	4.1	0.5	0.6	0.8	0.5	1.1	0.0	1.7	0.8	1.8
11.5 - 12.5	0.3	3.1	0.4	0.3	1.0	0.6	0.2	1.2	1.5	0.0	2.0
12.5 - 13.5	1.1	0.6	0.2	0.0	0.5	0.9	0.7	0.3	0.7	0.5	1.6
13.5 - 14.5	0.4	0.0	0.0	0.5	0.2	0.1	0.0	0.1	0.0	0.1	1.4
14.5 - 15.5	0.0	1.3	0.2	0.5	0.0	0.0	0.0	0.9	0.5	0.1	0.9
15.5 - 16.5	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.1	0.3	0.3	1.4
16.5 - 17.5	0.9	0.0	0.0	0.0	0.6	0.0	0.0	0.7	0.0	0.3	2.0
17.5 - 18.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	1.2
18.5 - 19.5	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
19.5 +	0.4	0.5	0.5	0.8	1.7	0.3	0.2	3.8	1.4	1.0	27.3
SAMPLE SIZE	378	889	1021	696	833	632	1048	924	1046	579	548
PERCENTILES											
5	2.30	2.50	2.10	1.90	1.80	1.50	2.00	1.60	1.90	2.00	1.60
25	3.70	3.80	3.30	3.30	3.10	2.90	3.10	2.70	3.30	3.00	3.10
50	5.60	4.90	4.20	4.40	4.50	4.00	4.20	3.80	4.40	4.30	6.50
75	8.00	6.90	5.60	5.70	6.50	5.60	5.40	5.80	6.50	6.30	21.40
95	11.30	12.40	8.80	8.40	10.50	9.80	8.60	14.90	10.50	9.40	48.00

Nutrition Canada

Table 13.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF SERUM FOLATE

NG/ML	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0.0 - 0.5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.5 - 1.5	0.0	0.1	3.0	5.9	2.8	5.3	0.8	5.9	3.5	0.1	11.1
1.5 - 2.5	3.1	7.6	11.2	8.8	21.6	14.9	11.2	17.1	16.0	26.7	17.7
2.5 - 3.5	14.2	17.5	16.0	30.0	20.1	28.8	23.2	24.4	20.5	25.4	13.3
3.5 - 4.5	17.3	25.4	25.1	25.0	22.0	23.8	26.0	24.4	17.2	18.7	15.5
4.5 - 5.5	21.5	20.8	16.7	12.7	13.5	12.0	16.9	10.6	17.2	13.1	4.4
5.5 - 6.5	19.9	12.2	15.4	10.9	4.7	4.7	8.6	5.4	14.8	6.7	0.0
6.5 - 7.5	7.5	4.3	2.0	3.7	4.8	3.1	4.5	6.8	3.7	2.7	2.2
7.5 - 8.5	5.3	6.2	3.0	0.2	1.6	2.4	2.0	0.9	1.8	1.1	4.4
8.5 - 9.5	7.5	1.8	4.0	1.6	1.7	1.6	2.2	0.4	0.3	0.4	0.0
9.5 - 10.5	2.6	0.9	0.8	0.0	0.0	1.6	1.3	1.0	0.9	1.1	2.2
10.5 - 11.5	0.3	0.3	0.5	0.0	1.5	0.7	0.4	0.0	1.2	0.4	2.2
11.5 - 12.5	0.2	0.2	0.3	0.0	0.4	0.0	0.0	0.0	0.9	0.0	0.0
12.5 - 13.5	0.0	0.8	0.5	0.0	4.2	0.0	0.2	0.0	0.0	0.0	4.4
13.5 - 14.5	0.0	0.0	0.0	0.0	0.6	0.4	0.0	0.0	0.0	1.2	6.6
14.5 - 15.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
15.5 - 16.5	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.4	0.0	0.0	0.0
16.5 - 17.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17.5 - 18.5	0.0	0.0	0.9	0.0	0.0	0.1	0.0	0.0	1.1	0.0	0.0
18.5 - 19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
19.5 +	0.0	1.1	0.0	0.7	0.0	0.0	0.6	1.6	0.2	0.5	15.5
SAMPLE SIZE	100	217	193	131	120	104	244	190	165	105	45
PERCENTILES											
5	2.80	2.10	1.50	1.40	1.70	1.10	2.00	1.30	1.50	1.80	1.20
25	3.80	3.40	3.00	2.90	2.50	2.70	3.00	2.60	2.70	2.20	2.10
50	5.10	4.40	4.20	3.70	3.70	3.50	4.00	3.50	3.90	3.40	4.00
75	6.40	5.60	6.00	4.70	5.10	4.60	5.30	4.70	5.50	4.70	12.70
95	9.40	8.70	9.00	6.90	12.10	8.10	8.90	7.90	8.20	8.80	42.90

Nutrition Canada

Table 13.3

NATIONAL SURVEY
CLASSIFICATION OF SERUM FOLATE VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	10.5	4.3	11.2	7.2	11.6	16.5	8.8	19.9	11.9	14.8	17.8
	M[b]	28.6	47.0	60.1	55.3	42.7	53.2	65.4	46.2	47.9	39.3	24.1
	N[c]	122	324	383	272	291	180	364	337	356	190	191
URBAN	H	9.5	9.0	9.1	12.9	21.1	13.4	16.1	29.8	16.1	15.5	14.0
	M	42.6	48.7	56.6	71.3	50.0	47.5	58.0	42.0	36.0	41.3	31.9
	N	138	322	359	216	291	244	386	314	348	225	207
RURAL	H	5.2	2.6	8.7	18.0	12.2	20.4	17.7	14.1	10.4	9.6	19.3
	M	36.0	46.0	48.5	45.2	51.5	54.0	49.4	50.6	51.1	64.2	21.3
	N	118	243	279	208	251	208	298	273	342	164	150
SUMMER-FALL	H	5.8	4.5	11.0	13.1	10.0	11.8	10.8	12.4	11.5	14.8	12.9
	M	36.1	48.7	53.7	54.9	48.8	62.6	60.4	41.0	44.7	44.5	30.6
	N	198	444	502	312	402	330	526	445	502	296	248
WINTER-SPRING	H	10.9	5.1	8.8	10.0	18.0	22.5	15.3	29.2	13.3	12.3	20.0
	M	33.6	45.7	58.6	56.5	45.0	42.0	57.9	51.4	47.4	49.1	22.7
	N	180	445	519	384	431	302	522	479	544	283	300
TOTAL	H	8.4	4.8	10.0	11.3	14.0	17.2	13.0	20.9	12.4	13.4	16.8
	M	34.8	47.1	55.9	55.8	46.9	52.1	59.1	46.2	46.1	47.0	26.3
	N	378	889	1021	696	833	632	1048	924	1046	579	548

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.

Table 13.4

INDIAN SURVEY
CLASSIFICATION OF SERUM FOLATE VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.7	4.3	5.4	7.4	26.8	15.3	3.1	14.8	15.1	23.9	20.0
	M [b]	53.9	54.7	56.6	63.0	39.5	55.9	68.2	59.5	45.8	51.0	40.0
	N [c]	42	105	117	77	71	61	133	98	95	56	15
REMOTE	H	5.3	10.7	24.3	22.2	20.9	27.6	22.2	31.2	28.0	31.9	33.3
	M	35.1	52.1	46.1	69.4	66.9	67.5	54.2	50.1	41.3	50.9	26.7
	N	58	112	76	54	49	43	111	92	70	49	30
ALGONKIAN	H	0.0	14.6	26.1	18.5	18.9	32.1	26.6	29.5	15.5	25.8	35.7
	M	49.9	47.0	59.7	66.7	47.7	44.6	54.6	63.9	45.1	66.9	21.4
	N	32	63	45	34	37	18	57	57	40	20	14
IROQUOIAN	H	0.0	9.7	8.9	0.0	33.5	3.4	0.9	17.2	24.8	16.1	0.0
	M	50.8	38.3	47.4	71.5	53.7	72.8	73.6	70.1	49.4	29.5	33.3
	N	11	30	36	17	18	19	38	23	30	14	3
PLAINS	H	5.8	4.8	12.3	21.4	32.4	27.0	7.1	24.7	16.2	37.3	33.3
	M	40.5	57.2	49.1	64.3	39.2	54.2	68.1	40.8	43.5	53.4	13.3
	N	25	50	32	21	30	33	57	33	46	27	15
PLATEAU	H	0.0	9.1	3.9	14.7	10.5	22.1	0.9	13.3	31.9	23.1	37.5
	M	24.7	59.6	56.9	53.6	83.6	60.9	58.5	52.8	61.5	58.2	50.0
	N	15	29	36	29	14	13	44	33	24	17	8
PACIFIC	H	0.0	6.5	12.2	4.8	7.7	9.0	10.8	23.5	26.4	20.2	0.0
	M	49.1	58.7	49.5	71.3	68.3	84.3	44.8	64.8	30.1	42.8	66.7
	N	12	37	36	25	21	18	38	36	19	19	3
TOTAL [e]	H	3.1	7.9	14.3	14.8	24.5	20.3	12.0	23.1	19.6	26.9	28.9
	M	44.1	53.3	51.7	66.2	50.2	60.5	61.7	54.8	44.2	51.0	31.1
	N	100	217	193	131	120	104	244	190	165	105	45
NATIONAL SURVEY TOTAL	H	8.4	4.8	10.0	11.3	14.0	17.2	13.0	20.9	12.4	13.4	16.8
	M	34.8	47.1	55.9	55.8	46.9	52.1	59.1	46.2	46.1	47.0	26.3
	N	378	889	1021	696	833	632	1048	924	1046	579	548

a. Percentage of population at high risk.
b. Percentage of population at moderate risk.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

Table 14.1

NATIONAL SURVEY
PERCENTAGE DISTRIBUTION OF URINARY IODINE

MCG/G CREATININE	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
0 - 50	0.0%	0.0%	0.3%	0.1%	0.1%	0.8%	0.2%	0.0%	0.2%	0.0%	0.0%
50 - 100	1.4	1.4	8.9	12.7	6.8	5.4	7.0	8.4	4.9	5.3	2.8
100 - 150	2.7	5.3	15.4	26.0	15.0	24.0	13.0	15.9	15.4	12.1	11.7
150 - 200	2.8	10.3	12.1	18.8	21.0	17.9	17.4	18.6	17.3	16.6	17.0
200 - 250	9.6	10.7	16.6	13.5	17.9	12.0	15.7	14.6	19.8	20.0	17.5
250 - 300	9.3	12.4	10.0	9.9	9.7	12.7	11.7	15.0	10.7	9.9	15.1
300 - 350	6.8	9.5	8.5	4.8	6.5	6.1	9.3	7.2	8.0	8.5	8.8
350 - 400	8.7	9.6	7.4	2.6	7.0	7.1	6.8	7.5	4.9	5.7	6.7
400 - 450	9.0	6.9	3.7	1.4	4.1	2.9	3.9	4.3	4.0	5.7	6.7
450 - 500	5.3	5.8	3.1	3.1	2.1	2.8	2.4	2.1	3.9	2.3	3.0
500 - 550	4.4	3.3	2.7	1.8	2.8	2.6	2.3	1.2	1.3	2.3	2.5
550 - 600	4.2	4.5	2.0	0.6	0.7	0.9	1.3	1.0	2.7	1.6	1.6
600 - 650	2.5	2.0	0.6	0.5	1.9	0.2	2.8	0.9	0.9	2.2	1.7
650 - 700	3.0	3.9	0.8	0.9	0.4	0.9	0.6	0.4	1.7	3.3	0.6
700 - 750	2.9	2.3	0.4	0.5	0.8	0.2	2.7	0.5	0.1	0.2	0.8
750 - 800	3.8	1.8	0.6	0.2	0.0	0.1	0.2	0.1	0.2	0.1	0.4
800 - 850	2.4	1.2	1.8	0.0	0.0	0.1	0.0	0.2	0.6	0.6	0.5
850 - 900	3.8	1.6	1.4	0.6	0.7	0.1	0.4	0.0	0.1	0.5	0.4
900 - 950	1.2	0.2	0.3	0.6	0.0	0.2	0.1	0.0	0.1	0.0	0.1
950 - 1000	1.3	1.5	1.3	0.0	0.0	0.2	0.0	0.0	1.1	0.3	0.2
1000 +	13.9	4.9	1.1	0.3	1.7	1.8	1.2	1.2	1.0	2.0	1.2
SAMPLE SIZE	742	1282	1416	995	1218	884	1388	1295	1460	795	746
PERCENTILES											
5	157.00	130.00	83.00	78.00	88.00	95.00	89.00	91.00	96.00	93.00	111.00
25	294.00	241.00	151.00	123.00	157.00	146.00	168.00	151.00	161.00	176.00	181.00
50	440.00	356.00	235.00	181.00	223.00	207.00	236.00	223.00	232.00	234.00	250.00
75	770.00	536.00	359.00	266.00	328.00	317.00	353.00	310.00	347.00	363.00	362.00
95	1585.00	998.00	805.00	526.00	616.00	556.00	694.00	538.00	660.00	682.00	626.00

Nutrition Canada

Table 14.2

INDIAN SURVEY
PERCENTAGE DISTRIBUTION OF URINARY IODINE

MCG/G CREATININE	0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55 + M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
0 - 50	1.2%	0.2%	0.4%	2.5%	5.0%	4.9%	0.1%	0.0%	0.0%	0.2%	2.1%
50 - 100	1.4	3.1	7.0	3.5	5.1	10.1	5.5	4.6	9.5	5.8	2.1
100 - 150	4.5	6.7	18.1	19.9	12.8	11.1	19.0	13.8	9.5	8.0	17.0
150 - 200	14.7	10.9	18.0	14.4	16.6	19.0	20.1	16.6	18.5	11.9	17.0
200 - 250	6.0	16.5	14.9	7.4	9.8	16.3	12.6	17.5	18.6	15.8	25.5
250 - 300	7.8	11.3	11.6	16.1	9.8	11.4	10.7	6.0	10.5	14.8	8.5
300 - 350	9.3	11.6	9.1	7.5	13.1	7.7	7.6	10.8	8.1	11.2	2.1
350 - 400	3.9	9.6	4.6	8.3	11.9	8.1	2.3	14.5	4.2	6.3	4.2
400 - 450	2.2	2.8	1.9	6.2	1.5	3.3	8.7	4.1	4.4	4.6	0.0
450 - 500	8.3	3.0	1.7	8.1	2.9	3.3	3.9	2.4	2.1	3.7	6.3
500 - 550	1.0	1.6	3.9	2.9	4.8	1.1	4.0	3.9	4.4	4.7	6.3
550 - 600	1.5	4.2	1.0	0.0	1.8	1.8	0.3	0.9	2.4	4.1	2.1
600 - 650	2.3	3.4	0.4	1.1	1.0	0.6	0.1	0.7	1.9	1.9	0.0
650 - 700	0.5	3.0	1.1	0.0	0.0	0.0	0.2	0.9	1.5	2.3	2.1
700 - 750	2.9	0.1	0.6	1.3	0.6	0.4	0.5	0.0	0.0	0.9	0.0
750 - 800	1.6	0.0	0.0	0.1	0.8	0.0	0.3	0.5	0.0	0.0	2.1
800 - 850	7.0	2.9	0.9	0.0	0.0	0.2	0.0	0.0	0.0	1.6	2.1
850 - 900	1.4	1.1	0.8	0.0	0.0	0.0	0.0	0.2	1.2	0.6	0.0
900 - 950	0.0	0.7	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
950 - 1000	4.7	0.9	0.4	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
1000 +	16.9	5.3	2.7	0.0	1.7	0.0	2.2	1.7	2.6	0.6	0.0
SAMPLE SIZE	116	212	190	129	120	109	241	173	168	102	47
PERCENTILES											
5	128.00	124.00	80.00	81.00	49.00	68.00	92.00	114.00	91.00	99.00	102.00
25	233.00	206.00	149.00	148.00	158.00	148.00	150.00	165.00	165.00	191.00	153.00
50	400.00	304.00	226.00	258.00	257.00	222.00	214.00	234.00	234.00	274.00	227.00
75	840.00	492.00	325.00	377.00	367.00	326.00	339.00	366.00	352.00	407.00	380.00
95	1500.00	1018.00	747.00	504.00	571.00	478.00	542.00	557.00	667.00	670.00	669.00

Nutrition Canada

Table 14.3

NATIONAL SURVEY
CLASSIFICATION OF URINARY IODINE VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65 + M	10-19 F	20-39 F	40-64 F	65 + F	PREGNANT WOMEN
METRO-POLITAN	H[a]	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0
	M[b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N[c]	284	453	511	368	406	261	461	452	481	260	270
URBAN	H	0.0	0.0	0.4	0.4	0.1	2.5	0.4	0.0	0.7	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	237	450	492	335	440	316	514	442	501	296	281
RURAL	H	0.0	0.0	0.0	0.0	0.3	0.7	0.5	0.0	0.1	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	221	379	413	292	372	307	413	401	478	239	195
SUMMER-FALL	H	0.0	0.0	0.7	0.3	0.0	1.3	0.2	0.2	0.5	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	366	647	660	452	568	467	681	606	698	401	349
WINTER-SPRING	H	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	376	635	756	543	650	417	707	689	762	394	397
TOTAL	H	0.0	0.0	0.4	0.2	0.1	0.9	0.2	0.1	0.3	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	742	1282	1416	995	1218	884	1388	1295	1460	795	746

a. Percentage of population at high risk.
b. No moderate risk classification.
c. Number in sample.

Table 14.4

INDIAN SURVEY
CLASSIFICATION OF URINARY IODINE VALUES

STRATUM		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 [d] M	55 + [d] M	10-19 F	20-39 F	40-54 [d] F	55 + [d] F	PREGNANT WOMEN
CLOSE	H [a]	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0
	M [b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N [c]	55	108	111	73	63	58	130	89	91	53	12
REMOTE	H	2.3	0.4	0.9	5.0	7.1	12.2	0.3	0.0	0.0	0.7	2.9
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	61	104	79	56	57	51	111	84	77	49	35
ALGONKIAN	H	0.0	1.0	1.8	0.0	6.0	0.0	0.0	0.0	0.0	1.4	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	34	56	42	33	31	18	55	52	37	17	12
IROQUOIAN	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	11	31	33	15	15	19	35	22	28	13	3
PLAINS	H	2.3	0.0	0.0	6.2	1.1	10.3	0.0	0.0	0.0	0.0	5.3
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	28	57	32	23	38	38	60	30	53	29	19
PLATEAU	H	0.0	0.0	0.0	0.0	0.0	10.5	2.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	25	26	34	29	15	11	43	30	24	16	8
PACIFIC	H	0.0	0.0	0.0	0.0	22.3	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	15	33	39	23	21	18	37	30	19	18	3
TOTAL [e]	H	1.2	0.2	0.4	2.5	5.1	4.9	0.2	0.0	0.0	0.3	2.1
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	116	212	190	129	120	109	241	173	168	102	47
NATIONAL SURVEY TOTAL	H	0.0	0.0	0.4	0.2	0.1	0.9	0.2	0.1	0.3	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N	742	1282	1416	995	1218	884	1388	1295	1460	795	746

a. Percentage of population at high risk.
b. No moderate risk classification.
c. Number in sample.
d. National population (40-64 M + F, 65 + M + F).
e. Total includes Mackenzie River Area.

TABLE 14.5

NATIONAL AND INDIAN SURVEY

PREVALENCE OF GOITRE

	0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65 + [c] M	10-19 F	20-39 F	40-64 [c] F	65 + [c] F	PREGNANT WOMEN
NATIONAL II + III[a]	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.3	1.6	0.4	2.8
I[a]	1.8	4.6	7.7	6.4	3.1	1.2	9.8	8.6	8.2	3.5	17.8
N[b]	1214	1300	1374	966	1186	855	1432	1295	1451	794	753
INDIANS II + III	0.0	0.1	0.0	0.0	0.0	0.0	1.3	0.2	0.7	2.4	0.0
I	0.0	0.0	0.0	2.9	0.4	0.0	1.6	4.3	2.2	1.1	4.1
N	200	232	197	131	129	110	266	191	177	109	49

[a] Percentage of population with WHO Grade I or II and III goitres.

[b] Number in sample.

[c] In Indian population (40-54 M and F, 55+ M and F).

TABLE 14.6

INDIAN SURVEY

PREVALENCE OF GOITRE IN RELATION TO IODINE EXCRETION

URINARY IODINE (mcg/gm creatinine)		0-4 MF	5-9 MF	10-19 M	20-39 M	40-54 M	55+ M	10-19 F	20-39 F	40-54 F	55 + F	PREGNANT WOMEN
<100	%[a]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.1	5.2	0.0	50.0
	N[b]	3	8	16	7	11	13	19	10	17	7	2
100 - 300	%	0.0	0.0	0.0	5.4	0.0	0.0	4.2	2.3	2.4	3.0	3.2
	N	42	96	108	76	57	63	148	96	91	50	31
300 - 700	%	0.0	0.0	0.0	0.0	0.0	0.0	2.1	5.5	2.5	5.9	0.0
	N	38	73	47	37	42	25	58	57	52	37	11
700 +	%	0.0	0.9	0.0	0.0	12.0	0.0	0.0	0.0	14.6	0.0	0.0
	N	31	24	13	2	7	2	13	5	5	4	2

[a] Percentage of population with goitre (grades I, II and III).

[b] Number in sample.

TABLE 14.7

PRAIRIE SURVEY

PREVALENCE OF GOITRE IN RELATION TO IODINE EXCRETION

URINARY IODINE (mcg/gm creatinine)		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 M	65+ M	10-19 F	20-39 F	40-64 F	65+ F	PREGNANT WOMEN
<100	%[a]	0.0	0.0	55.5	26.3	7.3	0.0	29.9	39.1	5.7	0.0	0.0
	N[b]	1	3	10	9	14	7	20	14	9	4	1
100 - 300	%	0.0	11.7	36.6	29.2	10.6	1.9	44.7	35.6	27.6	16.4	46.0
	N	19	82	149	113	145	110	128	125	170	56	87
300 - 700	%	0.0	20.4	27.3	13.3	9.3	5.2	37.6	40.1	25.2	13.3	43.3
	N	41	123	97	57	84	77	97	71	110	86	60
700 +	%	0.0	12.7	26.4	0.0	24.3	17.8	46.1	23.9	46.1	1.0	38.5
	N	66	38	23	8	14	11	19	10	15	14	13

[a] Percentage of population with goitre (grades I, II and III).

[b] Number in sample.

TABLE 15.2 **NATIONAL AND INDIAN SURVEYS**

PREVALENCE OF MINOR WEIGHT DEFICITS

		< 1 year MF	1-4 years MF	0-4 years MF	5 years MF
NATIONAL	%[a]	0.1	4.0	3.4	6.3
	N[b]	243	1015	1258	235
INDIANS	%			3.2	7.6
	N			200	46

[a] Percentage of population with body weight between 0.6 and 0.8 of the median weight for age.

[b] Number in sample.

TABLE 15.3

NATIONAL AND INDIAN SURVEYS

PREVALENCE OF ABNORMALLY SMOOTH OR RED TONGUE

		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65 + [c] M	10-19 F	20-39 F	40-64 [c] F	65 + [c] F	PREGNANT WOMEN
NATIONAL	%[a]	0.0	0.0	0.0	0.0	1.4	6.9	0.3	0.2	0.4	3.0	0.7
	N[b]	1216	1310	1383	974	1203	865	1442	1308	1471	804	759
INDIAN	%	0.0	0.0	0.0	3.0	3.3	4.4	0.0	0.0	0.0	2.8	4.0
	N	200	237	200	135	131	115	267	194	179	111	50

[a] Percentage of population.

[b] Number in sample.

[c] In Indian Population (40-54 M + F, 55 + M + F).

TABLE 15.4

NATIONAL AND INDIAN SURVEYS

PREVALENCE OF ANGULAR LESIONS OF THE LIPS OR EYELIDS

		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65 + [c] M	10-19 F	20-39 F	40-64 [c] F	65 + [c] F	PREGNANT WOMEN
NATIONAL	%[a]	1.2	3.2	2.6	3.8	5.2	12.2	2.4	2.6	4.0	14.9	7.5
	N[b]	1216	1310	1383	974	1203	865	1442	1308	1471	804	759
INDIANS	%	1.6	1.4	4.2	3.6	10.9	13.5	2.2	1.0	6.4	7.6	2.0
	N	200	237	200	135	131	115	267	194	179	111	50

[a] Percentage of population.

[b] Number in sample.

[c] In Indian Population (40-54 M + F, 55 + M + F).

TABLE 15.5

NATIONAL AND INDIAN SURVEYS

PREVALENCE OF CHEILOSIS

		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65 + [c] M	10-19 F	20-39 F	40-64 [c] F	65 + [c] F	PREGNANT WOMEN
NATIONAL	%[a]	0.1	0.6	1.0	0.9	0.6	2.1	0.4	0.1	0.0	0.9	1.2
	N[b]	1216	1310	1383	974	1203	865	1442	1308	1471	804	759
INDIANS	%	0.0	0.0	2.1	0.0	5.3	1.9	0.5	0.0	0.0	0.0	0.0
	N	200	237	200	135	131	115	267	194	179	111	50

[a] Percentage of population.

[b] Number in sample.

[c] In Indian Population (40-54 M + F, 55 + M + F).

TABLE 15.6

NATIONAL AND INDIAN SURVEYS

PREVALENCE OF BILATERAL ABSENCE OF KNEE AND/OR ANKLE JERKS

		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65 + [c] M	10-19 F	20-39 F	40-64 [c] F	65 + [c] F	PREGNANT WOMEN
NATIONAL	%[a]		0.0	2.1	2.6	3.1	18.4	1.3	2.7	1.8	17.0	1.7
	N[b]		1087	1380	973	1195	859	1440	1305	1462	799	757
INDIANS	%		1.2	0.7	0.2	4.3	20.3	4.2	5.7	7.1	24.2	0.0
	N		193	199	134	131	115	267	194	178	109	50

[a] Percentage of population.

[b] Number in sample.

[c] In Indian Population (40-54 M + F, 55 + M + F).

TABLE 15.7

NATIONAL AND INDIAN SURVEYS

PREVALENCE OF ABSENT VIBRATORY SENSE (ANKLE)

		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65 + [c] M	10-19 F	20-39 F	40-64 [c] F	65 + [c] F	PREGNANT WOMEN
NATIONAL	%[a]		0.1	0.0	0.0	0.4	7.5	0.0	0.0	0.2	3.6	0.0
	N[b]		1147	1456	1025	1242	910	1517	1376	1539	848	779
INDIANS	%		0.0	0.0	0.0	0.0	9.2	0.3	0.0	0.0	3.0	2.0
	N		197	204	138	133	116	269	197	180	114	50

[a] Percentage of population.

[b] Number in sample.

[c] In Indian Population (40-54 M + F, 55 + M + F).

TABLE 15.8

NATIONAL AND INDIAN SURVEYS

PREVALENCE OF BILATERAL PRETIBIAL PITTING EDEMA

		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64[c] M	65 +[c] M	10-19 F	20-39 F	40-64[c] F	65 +[c] F	PREGNANT WOMEN
NATIONAL	%[a]		0.0	0.3	1.3	6.9	22.4	0.9	9.9	24.2	50.0	31.2
	N[b]		1087	1380	973	1195	859	1440	1305	1462	799	757
INDIANS	%		0.0	0.0	0.2	7.0	9.0	0.1	6.4	27.3	28.9	20.0
	N		193	199	134	131	115	267	194	178	109	50

[a] Percentage of population.

[b] Number in sample.

[c] In Indian Population (40-54 M + F, 55 + M + F).

TABLE 15.9

NATIONAL, INDIAN AND ESKIMO SURVEYS

PREVALENCE OF DIFFUSE BLEEDING OF GUMS

		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65 + [c] M	10-19 F	20-39 F	40-64 [c] F	65 + [c] F	PREGNANT WOMEN
NATIONAL	%[a]	0.0	0.2	3.5	12.5	5.9	3.6	4.5	9.2	4.5	2.7	12.5
	N[b]	1261	1355	1414	1000	1214	875	1472	1333	1486	814	765
INDIANS	%	0.0	2.4	6.2	17.6	19.2	14.4	8.8	19.6	14.0	9.4	24.0
	N	201	242	201	135	131	115	268	196	180	111	50
ESKIMOS	%	0.0	0.0	4.1	51.6	59.6	61.5	7.7	46.9	54.5	68.4	27.8
	N	34	42	37	34	39	28	31	40	39	18	18

[a] Percentage of population.

[b] Number in sample.

[c] In Eskimo population (40-54 M + F, 55+ M + F).

TABLE 15.10

NATIONAL AND INDIAN SURVEYS

PREVALENCE OF PURPURA OR PETECHIAE

		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65 + [c] M	10-19 F	20-39 F	40-64 [c] F	65 + [c] F	PREGNANT WOMEN
NATIONAL	%[a]	0.0	0.3	0.1	0.0	0.5	3.0	0.1	0.2	0.8	1.7	0.5
	N[b]	1261	1355	1414	1000	1214	875	1472	1333	1486	814	765
INDIANS	%	0.0	0.0	0.0	0.0	0.4	1.2	0.0	0.0	0.0	0.9	0.0
	N	201	242	201	135	131	115	268	196	180	111	50

[a] Percentage of population.

[b] Number in sample.

[c] In Indian Population (40-54 M + F, 55 + M + F).

TABLE 15.11 **CLINICAL SIGNS, WITH ZERO OR LOW PREVALENCES, CONSIDERED NUTRITIONALLY INSIGNIFICANT IN CANADA**[a]

CLINICAL SIGNS	NATIONAL			INDIAN			ESKIMO		
	%	Number in Sample	Physiological Group	%	Number in Sample	Physiological Group	%	Number in Sample	Physiological Group
Protein-calorie malnutrition (0-5 years)									
Bilateral pretibial pitting edema	0	1493	0-5 MF	0	246	0-5 MF	0	39	0-5 MF
Major Weight deficits	0.3	235	5 MF	0.2	200	0-4 MF	0	39	0-5 MF
Painless pluckability of hair	0.1	1258	0-4 MF	0	246	0-5 MF	0	39	0-5 MF
Rickets (0-5 years)									
Rachitic rosary[b]	1.8	224	5 MF	0	245	0-5 MF	0	37	0-5 MF
Craniotabes	2.1	226	< 1 MF	0	245	0-5 MF	0	37	0-5 MF
Bowed legs[c]	1.3	226	< 1 MF	1.7	201	0-4 MF	0	37	0-5 MF
Vitamin C deficiency									
Scorbutic rosary	0	1261	0-4 MF	0	201	0-4 MF	0	30	0-4 MF
Riboflavin deficiency									
Nasolabial seborrhea	0.4	1308	20-39 F	0.8	194	20-39 F	0	287	All ages MF

[a] Data presented are for the age-sex group with the **highest** observed prevalence.

[b] The 5 year olds had the only observed cases of rachitic rosary.

[c] The 0-4 year olds had the only observed cases of bowed legs.

TABLE 15.12 **CLINICAL SIGNS, WITH MODERATE PREVALENCES, CONSIDERED NUTRITIONALLY INSIGNIFICANT IN CANADA**

CLINICAL SIGNS		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [c] M	65+ [c] M	10-19 F	20-39 F	40-64 [c] F	65+ [c] F	PREGNANT WOMEN
Rickets												
Delayed walking (0-5 years only)	Nat[a]	1.5	0.7									
	N[b]	1239	224									
	I[c]	4.9	1.0									
	N	201	44									
	E[d]	15.5	11.0									
	N	29	8									
Vitamin A deficiency												
Thickened opaque bulbar conjunctivae (6+ years only)	Nat		0.0	0.0	1.1	7.1	15.9	0.0	0.7	3.3	8.4	0.3
	N		1089	1384	974	1203	865	1442	1308	1471	804	759
	I		0.0	0.1	0.0	3.5	10.0	0.0	0.0	0.7	5.2	0.0
	N		193	200	135	131	115	267	194	179	111	50
	E		0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0
	N		23	29	31	34	21	26	38	32	17	15

CLINICAL SIGNS		0-4 MF	5-9 MF	10-19 M	20-39 M	40-64 [e] M	65+ [e] M	10-19 F	20-39 F	40-64 [e] F	65+ [e] F	PREGNANT WOMEN
Vitamin A or Vitamin C deficiency	Nat	5.2	19.2	15.6	4.1	2.8	4.3	21.6	9.6	6.4	2.4	11.8
	N	1205	1309	1384	974	1203	865	1442	1308	1471	804	759
Follicular hyperkeratosis, arms and/or back (all ages)	I	13.2	25.3	21.2	9.1	2.5	1.5	25.5	11.7	5.6	4.9	8.2
	N	198	237	200	135	131	115	267	194	179	111	50
	E	11.5	15.3	9.5	8.1	5.1	5.6	15.9	13.9	8.9	7.0	0.0
	N	25	30	29	31	34	21	26	38	32	17	15
Niacin deficiency Pellagrous or skinfold dermatitis (6+ years only)	Nat		0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.5	2.4	0.1
	N		1089	1384	974	1203	865	1442	1308	1471	804	759
	I		0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
	N		193	200	135	131	115	267	194	179	111	50
Niacin deficiency Abnormal pigmentation of the skin (6+ years only)	Nat		0.3	0.3	0.6	4.0	9.5	1.9	0.5	3.3	8.8	0.5
	N		1089	1384	974	1203	865	1442	1308	1471	804	759
	I		1.4	2.1	3.3	9.0	11.0	0.1	2.4	6.5	14.3	0.0
	N		193	200	135	131	115	267	194	179	111	50
	E		0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	6.7
	N		23	29	31	34	21	26	38	32	17	15

[a] Percentage of national population.
[b] Number in sample.
[c] Percentage of Indian population.
[d] Percentage of Eskimo population.
[e] Indian and Eskimo populations (40-54 M + F, 55+ M + F).

Table 16.1

NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN
PERCENTAGE DISTRIBUTION OF CALORIES

CAL/KG BODY WEIGHT/DAY	<1 YR MF	1-4 YR MF
0 - 10	0.3%	0.0%
10 - 20	1.9	0.0
20 - 30	0.0	0.5
30 - 40	2.4	0.3
40 - 50	1.4	2.3
50 - 60	3.4	4.4
60 - 70	9.1	4.5
70 - 80	6.9	3.9
80 - 90	11.6	13.8
90 - 100	8.4	11.6
100 - 110	8.7	10.0
110 - 120	10.3	9.6
120 - 130	4.9	9.8
130 - 140	8.8	5.5
140 - 150	4.2	6.4
150 - 160	5.3	3.0
160 - 170	1.5	3.5
170 - 180	2.7	2.8
180 - 190	1.9	0.8
190 - 200	1.5	0.2
200 +	3.7	6.1
SAMPLE SIZE	237	988
PERCENTILES		
5	44.86	55.68
25	79.35	85.39
50	104.09	109.10
75	139.56	135.54
95	192.86	221.61

CAL/DAY	<1 YR MF	1-4 YR MF
0 - 250	1.6%	0.2%
250 - 500	8.2	0.6
500 - 750	31.8	3.0
750 - 1000	23.9	11.0
1000 - 1250	14.0	14.7
1250 - 1500	11.7	18.2
1500 - 1750	4.7	20.2
1750 - 2000	2.8	10.0
2000 - 2250	0.9	8.0
2250 - 2500	0.0	4.0
2500 - 2750	0.0	2.4
2750 - 3000	0.0	1.8
3000 - 3250	0.0	1.2
3250 - 3500	0.0	0.8
3500 - 3750	0.0	0.7
3750 - 4000	0.0	0.5
4000 - 4250	0.0	0.3
4250 - 4500	0.0	0.3
4500 - 4750	0.0	0.0
4750 - 5000	0.0	0.0
5000 +	0.0	1.0
SAMPLE SIZE	249	1025
PERCENTILES		
5	364.00	792.00
25	667.00	1192.00
50	810.00	1521.00
75	1152.00	1928.00
95	1509.00	3007.00

Nutrition Canada

Table 16.2 **NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN**
PERCENTAGE DISTRIBUTION OF DIETARY PROTEIN

G/KG BODY WEIGHT/DAY	<1 YR MF	1-4 YR MF
0.00 - 0.50	0.7%	0.2%
0.50 - 0.75	1.0	0.1
0.75 - 1.00	1.6	0.5
1.00 - 1.25	0.0	0.0
1.25 - 1.50	0.0	1.2
1.50 - 1.75	2.8	1.9
1.75 - 2.00	1.7	3.1
2.00 - 2.25	0.9	4.5
2.25 - 2.50	2.1	2.6
2.50 - 2.75	0.1	4.9
2.75 - 3.00	12.4	7.4
3.00 - 3.50	8.7	10.9
3.50 - 4.00	6.6	12.1
4.00 - 4.50	7.8	11.0
4.50 - 5.00	12.1	14.1
5.00 - 5.50	11.7	7.4
5.50 - 6.00	6.4	4.4
6.00 - 6.50	11.3	2.9
6.50 - 7.00	5.1	2.5
7.00 - 7.50	2.7	1.1
7.50 +	3.3	6.1
SAMPLE SIZE	237	988
PERCENTILES		
5	1.65	1.84
25	3.03	2.95
50	4.61	3.96
75	5.66	4.98
95	7.13	7.77

G/DAY	<1 YR MF	1-4 YR MF
0 - 20	13.2%	1.6%
20 - 40	50.6	19.8
40 - 60	24.3	41.1
60 - 80	11.6	19.3
80 - 100	0.1	11.0
100 - 120	0.0	2.7
120 - 140	0.0	1.8
140 - 160	0.0	0.7
160 - 180	0.0	0.6
180 - 200	0.0	0.1
200 - 220	0.0	0.0
220 - 240	0.0	0.0
240 - 260	0.0	0.0
260 - 280	0.0	0.0
280 - 300	0.0	0.0
300 - 320	0.0	0.0
320 - 340	0.0	0.0
340 - 360	0.0	0.0
360 - 380	0.0	0.0
380 - 400	0.0	0.0
400 +	0.0	0.8
SAMPLE SIZE	249	025
PERCENTILES		
5	11.90	25.90
25	27.60	41.50
50	35.50	54.30
75	47.90	69.90
95	71.90	110.20

Nutrition Canada

Table 16.3

NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN
PERCENTAGE DISTRIBUTION OF DIETARY THIAMIN

MG/1000 CAL	<1 YR MF	1-4 YR MF
0.00 - 0.20	0.0%	0.2%
0.20 - 0.30	4.2	3.7
0.30 - 0.40	0.5	13.4
0.40 - 0.50	8.2	20.9
0.50 - 0.60	6.6	14.8
0.60 - 0.70	1.9	12.1
0.70 - 0.80	4.6	8.2
0.80 - 0.90	2.6	4.3
0.90 - 1.00	4.9	3.1
1.00 - 1.10	3.6	1.2
1.10 - 1.20	6.4	2.7
1.20 - 1.30	4.4	1.5
1.30 - 1.40	4.3	1.8
1.40 - 1.50	2.7	0.9
1.50 - 1.60	1.3	0.3
1.60 - 1.70	2.8	2.0
1.70 - 1.80	1.3	1.2
1.80 - 1.90	1.1	0.3
1.90 - 2.00	3.2	0.2
2.00 - 2.10	0.8	0.2
2.10 +	33.4	6.0
SAMPLE SIZE	249	1025
PERCENTILES		
5	0.40	0.30
25	0.76	0.43
50	1.32	0.57
75	2.18	0.81
95	6.16	2.26

MG/DAY	<1 YR MF	1-4 YR MF
0.00 - 0.20	1.8%	0.3%
0.20 - 0.40	11.6	6.1
0.40 - 0.60	17.3	14.8
0.60 - 0.80	8.5	17.7
0.80 - 1.00	6.2	17.8
1.00 - 1.20	5.2	10.1
1.20 - 1.40	5.5	7.0
1.40 - 1.60	2.8	5.4
1.60 - 1.80	8.1	3.5
1.80 - 2.00	4.1	0.9
2.00 - 2.20	6.3	1.5
2.20 - 2.40	0.6	2.7
2.40 - 2.60	2.7	1.7
2.60 - 2.80	6.6	0.8
2.80 - 3.00	1.1	1.2
3.00 - 3.20	0.8	0.7
3.20 - 3.40	1.3	0.7
3.40 - 3.60	1.1	0.3
3.60 - 3.80	0.5	0.1
3.80 - 4.00	0.0	1.2
4.00 +	6.8	4.5
SAMPLE SIZE	249	1025
PERCENTILES		
5	0.30	0.38
25	0.53	0.64
50	1.19	0.90
75	2.13	1.46
95	4.21	3.94

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Table 16.4 **NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN**
PERCENTAGE DISTRIBUTION OF DIETARY RIBOFLAVIN

MG/1000 CAL	<1 YR MF	1-4 YR MF
0.00 - 0.30	0.0%	0.7%
0.30 - 0.45	0.1	1.8
0.45 - 0.60	0.5	7.0
0.60 - 0.75	0.6	9.7
0.75 - 0.90	1.6	9.8
0.90 - 1.05	0.0	14.2
1.05 - 1.20	6.2	5.5
1.20 - 1.35	2.9	7.3
1.35 - 1.50	5.5	7.5
1.50 - 1.65	4.0	6.8
1.65 - 1.80	2.8	6.3
1.80 - 1.95	4.4	4.1
1.95 - 2.10	6.5	2.5
2.10 - 2.25	3.7	1.6
2.25 - 2.40	4.6	1.8
2.40 - 2.55	6.2	1.5
2.55 - 2.70	3.4	1.4
2.70 - 2.85	2.0	0.5
2.85 - 3.00	6.1	2.4
3.00 - 3.15	5.6	0.0
3.15 +	32.5	6.3
SAMPLE SIZE	249	1023
PERCENTILES		
5	1.12	0.53
25	1.80	0.83
50	2.51	1.21
75	3.47	1.75
95	6.14	3.28

MG/DAY	<1 YR MF	1-4 YR MF
0.0 - 0.5	2.1%	1.2%
0.5 - 1.0	9.4	13.1
1.0 - 1.5	17.4	21.3
1.5 - 2.0	14.0	17.6
2.0 - 2.5	19.7	14.4
2.5 - 3.0	10.0	9.7
3.0 - 3.5	5.4	6.9
3.5 - 4.0	4.5	4.7
4.0 - 4.5	8.8	2.6
4.5 - 5.0	5.7	1.6
5.0 - 5.5	0.0	1.0
5.5 - 6.0	0.0	0.8
6.0 - 6.5	0.0	1.2
6.5 - 7.0	0.0	0.1
7.0 - 7.5	0.0	0.3
7.5 - 8.0	0.0	0.1
8.0 - 8.5	0.0	0.0
8.5 - 9.0	0.0	0.3
9.0 - 9.5	0.0	0.0
9.5 - 10.0	0.0	0.0
10.0 +	2.3	2.3
SAMPLE SIZE	249	1025
PERCENTILES		
5	0.80	0.70
25	1.40	1.30
50	2.20	1.90
75	3.00	2.80
95	4.80	5.70

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Table 16.5

NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN
PERCENTAGE DISTRIBUTION OF DIETARY NIACIN

MG NIACIN EQUIV/1000 CAL	<1 YR MF	1-4 YR MF
0.0 - 1.5	0.0%	0.0%
1.5 - 3.0	0.0	0.0
3.0 - 4.5	0.0	0.3
4.5 - 6.0	0.0	1.0
6.0 - 7.5	0.0	4.1
7.5 - 9.0	0.5	5.8
9.0 - 10.5	5.8	11.1
10.5 - 12.0	2.8	13.3
12.0 - 13.5	7.6	12.1
13.5 - 15.0	10.4	12.8
15.0 - 16.5	8.8	10.3
16.5 - 18.0	7.6	7.3
18.0 - 19.5	5.8	3.9
19.5 - 21.0	6.7	5.3
21.0 - 22.5	7.2	2.6
22.5 - 24.0	5.2	1.1
24.0 - 25.5	5.2	1.3
25.5 - 27.0	4.0	0.5
27.0 - 28.5	3.2	1.6
28.5 - 30.0	7.6	0.1
30.0 +	10.7	4.6
SAMPLE SIZE	249	1025
PERCENTILES		
5	9.25	7.47
25	14.44	10.95
50	19.74	13.72
75	25.79	17.21
95	40.11	28.43

MG NIACIN EQUIV/DAY	<1 YR MF	1-4 YR MF
0 - 5	0.9%	0.5%
5 - 10	18.3	6.6
10 - 15	25.0	18.9
15 - 20	23.2	22.7
20 - 25	9.2	12.2
25 - 30	11.8	13.7
30 - 35	2.6	10.0
35 - 40	5.1	4.5
40 - 45	0.0	3.0
45 - 50	1.0	1.8
50 - 55	0.0	1.7
55 - 60	0.0	0.5
60 - 65	0.0	0.3
65 - 70	0.0	0.0
70 - 75	1.3	0.2
75 - 80	0.0	0.2
80 - 85	0.0	0.0
85 - 90	0.2	0.0
90 - 95	0.2	0.0
95 - 100	0.0	0.0
100 +	0.5	2.3
SAMPLE SIZE	249	1025
PERCENTILES		
5	7.20	9.20
25	11.20	14.90
50	16.60	20.40
75	23.00	30.00
95	37.00	50.80

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Table 16.6 **NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN**
PERCENTAGE DISTRIBUTION OF:

DIETARY VITAMIN C

MG/DAY	<1 YR MF	1-4 YR MF
0 - 20	4.9%	10.8%
20 - 40	8.2	16.8
40 - 60	25.4	11.3
60 - 80	16.4	8.8
80 - 100	11.8	10.2
100 - 120	19.0	8.6
120 - 140	3.7	7.5
140 - 160	1.3	6.2
160 - 180	1.5	3.8
180 - 200	1.3	3.6
200 - 220	0.1	2.8
220 - 240	0.5	1.1
240 - 260	0.0	1.0
260 - 280	0.0	1.8
280 - 300	0.0	0.5
300 - 320	1.8	0.8
320 - 340	0.9	0.4
340 - 360	0.0	0.7
360 - 380	0.0	0.3
380 - 400	1.2	0.3
400 +	1.1	1.6
SAMPLE SIZE	249	1025
PERCENTILES		
5	21.00	10.00
25	49.00	35.00
50	73.00	84.00
75	114.00	141.00
95	306.00	279.00

DIETARY VITAMIN A

MCG RETINOL EQUIV./DAY	<1 YR MF	1-4 YR MF
0 - 250	4.2%	4.3%
250 - 500	9.3	17.5
500 - 750	9.3	16.3
750 - 1000	15.7	14.5
1000 - 1250	10.4	14.0
1250 - 1500	10.0	6.9
1500 - 1750	10.7	6.0
1750 - 2000	14.7	4.8
2000 - 2250	5.1	4.7
2250 - 2500	1.8	2.8
2500 - 2750	0.4	1.7
2750 - 3000	0.4	0.5
3000 - 3250	0.0	0.5
3250 - 3500	0.5	0.5
3500 - 3750	0.0	0.0
3750 - 4000	1.3	0.1
4000 - 4250	0.0	0.0
4250 - 4500	0.7	0.0
4500 - 4750	0.0	0.8
4750 - 5000	0.0	0.0
5000 +	4.8	3.2
SAMPLE SIZE	249	1025
PERCENTILES		
5	309.00	261.00
25	791.00	537.00
50	1273.00	954.00
75	1797.00	1554.00
95	4330.00	3211.00

Nutrition Canada

Table 16.7 **NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN**
PERCENTAGE DISTRIBUTION OF:

DIETARY CALCIUM

MG/DAY	<1 YR MF	1-4 YR MF
0 - 100	0.6%	0.6%
100 - 200	1.3	0.4
200 - 300	2.1	1.6
300 - 400	0.3	4.4
400 - 500	2.1	7.6
500 - 600	7.4	6.8
600 - 700	5.2	8.0
700 - 800	7.2	12.0
800 - 900	8.7	9.7
900 - 1000	9.8	7.5
1000 - 1200	13.4	15.5
1200 - 1400	22.5	7.5
1400 - 1600	5.5	6.6
1600 - 1800	4.2	4.6
1800 - 2000	2.4	1.7
2000 - 2200	1.3	1.0
2200 - 2400	0.0	0.8
2400 - 2600	4.1	0.5
2600 - 2800	0.0	0.3
2800 - 3000	1.0	0.3
3000 +	0.0	1.5
SAMPLE SIZE	249	1025
PERCENTILES		
5	477.00	360.00
25	766.00	653.00
50	1081.00	879.00
75	1266.00	1221.00
95	2422.00	1968.00

POTENTIAL DIETARY VITAMIN D

I.U./DAY	<1 YR MF	1-4 YR MF
0 - 50	3.8%	4.2%
50 - 100	0.0	7.3
100 - 150	2.8	10.7
150 - 200	1.7	13.8
200 - 250	3.2	13.5
250 - 300	8.0	7.7
300 - 350	3.9	6.6
350 - 400	6.7	3.6
400 - 450	7.6	4.0
450 - 500	2.3	3.0
500 - 550	4.3	4.0
550 - 600	1.1	3.5
600 - 650	6.2	2.9
650 - 700	11.1	4.6
700 - 750	11.6	1.2
750 - 800	4.3	1.5
800 - 850	4.1	0.3
850 - 900	2.1	0.7
900 - 950	0.5	0.3
950 - 1000	0.5	0.4
1000 +	13.2	5.2
SAMPLE SIZE	249	1025
PERCENTILES		
5	136.00	54.00
25	356.00	159.00
50	623.00	253.00
75	748.00	497.00
95	1657.00	1000.00

Nutrition Canada

Table 16.8 **NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN**
PERCENTAGE DISTRIBUTION OF:

DIETARY IRON

MG/DAY	<1 YR MF	1-4 YR MF
0.0 - 6.0	17.6%	24.4%
6.0 - 8.0	3.4	23.8
8.0 - 10.0	3.6	15.7
10.0 - 12.0	9.2	11.8
12.0 - 14.0	4.3	6.8
14.0 - 16.0	4.1	5.1
16.0 - 18.0	3.2	3.0
18.0 - 20.0	8.6	1.6
20.0 - 22.0	1.9	0.6
22.0 - 24.0	1.7	0.5
24.0 - 26.0	1.7	0.3
26.0 - 28.0	0.0	0.6
28.0 - 30.0	1.0	0.2
30.0 - 32.0	6.1	0.1
32.0 - 34.0	4.6	0.1
34.0 - 36.0	1.3	0.4
36.0 - 38.0	1.0	0.0
38.0 - 40.0	0.0	0.0
40.0 - 42.0	0.4	1.1
42.0 - 44.0	0.2	0.0
44.0 +	25.0	2.8
SAMPLE SIZE	249	1025
PERCENTILES		
5	1.60	3.20
25	10.00	6.00
50	19.40	8.20
75	44.10	11.70
95	93.40	29.30

HEMOGLOBIN

G/100 ML	<1 YR MF	1-4 YR MF
0.0 - 9.0	0.5%	0.1%
9.0 - 9.5	0.2	0.2
9.5 - 10.0	0.6	0.5
10.0 - 10.5	7.5	0.8
10.5 - 11.0	10.0	3.9
11.0 - 11.5	12.4	7.4
11.5 - 12.0	16.0	11.4
12.0 - 12.5	23.2	26.1
12.5 - 13.0	14.3	15.6
13.0 - 13.5	7.8	17.3
13.5 - 14.0	3.0	9.4
14.0 - 14.5	1.4	4.8
14.5 - 15.0	2.3	1.1
15.0 - 15.5	0.0	0.5
15.5 - 16.0	0.0	0.1
16.0 - 16.5	0.0	0.0
16.5 - 17.0	0.0	0.0
17.0 - 17.5	0.0	0.0
17.5 - 18.0	0.0	0.0
18.0 - 18.5	0.0	0.0
18.5 +	0.0	0.0
SAMPLE SIZE	245	1004
PERCENTILES		
5	10.20	10.80
25	11.20	12.00
50	12.00	12.40
75	12.60	13.10
95	13.80	14.00

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Table 16.9

NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN
PERCENTAGE DISTRIBUTION OF:

MCHC

%	<1 YR MF	1-4 YR MF
0.0 - 20.0	0.0%	0.0%
20.0 - 21.0	0.0	0.0
21.0 - 22.0	0.0	0.0
22.0 - 23.0	0.0	0.1
23.0 - 24.0	0.0	0.0
24.0 - 25.0	0.0	0.0
25.0 - 26.0	0.0	0.0
26.0 - 27.0	0.1	0.0
27.0 - 28.0	1.1	0.9
28.0 - 29.0	2.3	1.1
29.0 - 30.0	2.6	1.0
30.0 - 31.0	11.4	4.2
31.0 - 32.0	10.7	11.1
32.0 - 33.0	13.4	20.3
33.0 - 34.0	14.1	22.3
34.0 - 35.0	17.6	15.4
35.0 - 36.0	11.2	12.6
36.0 - 37.0	10.8	5.9
37.0 - 38.0	1.9	2.6
38.0 - 39.0	0.0	0.9
39.0 +	2.1	0.8
SAMPLE SIZE	243	972
PERCENTILES		
5	29.00	30.50
25	31.80	32.40
50	33.60	33.30
75	35.10	34.80
95	36.60	36.70

HEMATOCRIT

%	<1 YR MF	1-4 YR MF
0.0 - 29.0	1.8%	0 1%
29.0 - 30.0	0.0	0.0
30.0 - 31.0	2.5	0.0
31.0 - 32.0	0.6	0.3
32.0 - 33.0	8.3	0.7
33.0 - 34.0	10.5	2.3
34.0 - 35.0	7.7	7.4
35.0 - 36.0	12.5	12.5
36.0 - 37.0	14.6	15.3
37.0 - 38.0	13.1	17.4
38.0 - 39.0	12.6	15.8
39.0 - 40.0	2.7	11.5
40.0 - 41.0	7.8	7.5
41.0 - 42.0	2.6	4.1
42.0 - 43.0	0.0	2.4
43.0 - 44.0	0.6	0.9
44.0 - 45.0	1.2	0.1
45.0 - 46.0	0.0	0.0
46.0 - 47.0	0.0	0.0
47.0 - 48.0	0.0	0.1
48.0 +	0.0	0.7
SAMPLE SIZE	243	990
PERCENTILES		
5	31.00	34.00
25	34.00	36.00
50	36.00	37.00
75	38.00	39.00
95	40.00	41.00

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Table 16.10

NATIONAL SURVEY: INFANTS AND YOUNG CHILDREN
CLASSIFICATION OF:

HEMOGLOBIN VALUES

STRATUM		< 1 YR MF	1-4 YR MF
METRO-POLITAN	H[a]	1.4	0.5
	M[b]	0.2	2.9
	N[c]	87	358
URBAN	H	0.1	0.0
	M	1.2	8.1
	N	91	346
RURAL	H	0.0	0.7
	M	1.9	4.0
	N	67	300
SUMMER-FALL	H	1.3	0.2
	M	0.2	2.4
	N	119	511
WINTER-SPRING	H	0.0	0.7
	M	1.6	6.9
	N	126	493
TOTAL	H	0.6	0.4
	M	1.0	4.6
	N	245	1004

[a] Percentage of population at high risk.
[b] Percentage of population at moderate risk.
[c] Number in sample.

MCHC VALUES

STRATUM		< 1 YR MF	1-4 YR MF
METRO-POLITAN	H[a]	9.2	3.9
	M[b]	19.0	13.4
	N[c]	86	345
URBAN	H	6.1	2.5
	M	26.0	22.2
	N	90	337
RURAL	H	1.9	3.3
	M	25.2	13.0
	N	67	290
SUMMER-FALL	H	2.9	1.3
	M	38.9	19.3
	N	118	490
WINTER-SPRING	H	9.0	5.5
	M	10.2	11.6
	N	125	482
TOTAL	H	6.3	3.4
	M	22.9	16.5
	N	243	972

[a] Percentage of population at high risk.
[b] Percentage of population at moderate risk.
[c] Number in sample.

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