

A STUDY OF THE HEALTH OF SEVENTY-ONE

ELEMENTARY SCHOOL CHILDREN

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ELEMENTARY SCHOOL CHILDREN

I. Purpose:

In the midst of a nation wide enthusiasm for child health, the demand has come for a wider understanding among educators, of the various problems contributing to and influencing child health, and the exact contribution which our public schools can make toward preservation and improvement of the health of the child. Many persons who have studied the problem, concur in the belief that in the United States, the school is the officially accredited and the strategic agency for leading in the educational program for health, and for organizing and directing the health care of children of school age.

The purpose of this study was to investigate the health and health habits of a group of elementary school children, and to study certain pertinent problems which seemed to offer profitable fields for a constructive health program. It was hoped that the data compiled by such a study might form a base line from which to measure future progress in raising the health standards of these school children.

ACKNOWLEDGMENT

The writer is indebted to Professor Amy Jane Leazenby Englund, Head of the Department of Household Economics, for counsel and encouragement in the preparation of this paper. Her interest and sympathy in the health program made the study a most happy one. Further gratitude is due the parents and teachers for their hearty cooperation and kindness throughout the study.

11. The Field:

An elementary school was selected for the field in which to make the study. The school was located in a town of nearly 10,000 inhabitants, and had an enrolment of seventy-one pupils, whose ages ranged from five to sixteen years. Although not rural in its location, the school resembled the old type of country school more than a city system. The three class rooms, which were occupied by the pupils, did not meet the modern hygienic requirements of a school room. The size of the rooms was not adequate to provide for the comfort of the pupils and the teachers, and the structure was poorly ventilated and lighted. The double seats were stationary and no attempt was made to fit the individual pupils.

III. The Method of study:

The first step was to compile a concise, clear and tangible record form to be used in collecting the data for the case studies, since adequate records are essential for any study in child health.

School health records used in the public schools of Denver, Col.; Minneapolis, Minn.; and Springfield, Ill.; were secured. A tentative record sheet was also obtained from the division of school nursing of the National Organisation for Public Health Nursing. None of these forms, however, seemed to meet the needs of this particular study. After much time and thought, the following record form was evolved and it has proved adequate and satisfactory. The folder plan was especially helpful and made it possible to file additional data pertaining to each child.

No. _____ Name _____

PHYSICAL EXAMINATION RECORD

SOCIAL HISTORY

Age at Date of Birth	Health, or Cause of Death	Wt	Ht	Occupation	Weight per sq. ft.	Decent	Landmark
							Relatives or Lodgers
							Other Income
							Total Income

HOME CONDITIONS

Appliances	Beds	Bath	Per. per mo.
Refrigerator	Refr.	Refr.	No. rooms
Gas-stove or Electric	Refr.	Refr.	No. dark rooms
Cooperatives or O.N.M.	Refr.	Refr.	Sanitary
Food Sup. fed	Refr.	Refr.	
Refr.	Refr.	Refr.	

SOCIAL HISTORY

[illegible]

HOME CONDITIONS

[illegible]

No. Name

PHYSICAL EXAMINATION RECORD

Pupil's Name

School

Address 1

2

3

4

Telephone

GRADE	GRADE												CODE	
	KG.	1	2	3	4	5	6	7	8	9	10	11		12
Date														I. 1-Ten 2-Coffee 3-Candy between meals 4-No cereals 5-No vegetables 6-Sleeps with mouth open 7-Ears fast 8-Outside activities 9-Daily bowel movement
Age														II. 1-Poor 2-Frequent colds 3-Stomach trouble 4-Nutrition poor 5-Nutrition fair
Weight														III. 1-N/A 2-Lace
Height														IV. 1-Blepharitis 2-Conjunctivitis 3-Trachoma 4-Sternum
Underweight														V. 1-Nasal obstruction 2-Mouth breather
I. Habits														VI. 1-Berry 2-Decayed
II. Health														VII. 1-Tonsils diseased 2-Tonsils bad 3-Tonsils very bad
III. Head														
IV. Eyes														
V. Nose														
VI. Teeth														
VII. Throat														
VIII. Cervical Glands														
IX. Thyroid														
X. Ears														

[illegible]

The data for the study were collected from the findings of the physical examinations of the children and from the responses made by the parents to questionnaires and letters; and from the questionnaires returned by the family physicians. The following forms were used.

Hoping to stimulate the interest of the parents, and to gain their cooperation at the beginning of the health study, the following letter was sent to the parents of each child.

FORM I

Dear Parents:

We are anxious that you work with us in order that we may gain the very best results from our health program.

The following rules of the game are the simple means for the preservation and construction of a good, sound, robust body and happy mind for your child.

- I. A full bath more than once a week.
- II. Brushing the teeth at least once a day.
- III. Drinking at least four glasses of water a day.
- IV. A bowel movement every morning.
- V. Drinking at least three glasses of milk a day, and no coffee or tea.
- VI. Eating some vegetables, cereals, and fruit every day.
- VII. Walking or playing part of every day, out of doors.
- VIII. Sleeping long hours with windows wide open.

We are especially desirous for the formation of good habits of eating, since this factor means so much

to the health of the growing child. We are sure that you will be interested in these feeding suggestions.

Your Child's Food

Some of the recent studies which have been made seem to indicate that we are not giving our children enough food. Children too often go to school without any breakfast or with a hurried, inadequate one. This practice is to be strongly condemned, for, unless a proper breakfast is eaten, the day's fuel supply will not be sufficient and the child will have to draw on his reserve to supply the energy which he will need.

Your child should have plenty of milk, cereals, bread, fruit, vegetables, and animal foods.

Give:

Milk - at least a pint, better a quart, a day, since milk contains all the elements needed for growth and development. It contains Minerals for the formation of strong teeth and bones, Protein, the tissue building material, easy to digest Fat and Sugar, which supply energy, and Vitamins which promote and regulate growth and help to maintain health.

Cereals and Breads - From the various grain products is

secured starch, one of the most important fuels of the body, for the supply of heat and energy.

Fruit - Do not let a day go by without serving fruit at least once.

Vegetables - are often called the body regulators. They contain valuable minerals which help to build bone, teeth, tissue and blood. They, also, help to overcome and prevent constipation.

Animal foods are - meat, eggs, cheese and milk. Meat should be served no more than once a day.

Your Child Should Form Good Food Habits

1. He should eat three wholesome meals a day, at regular hours.
2. He should eat slowly and chew thoroughly. He should not bolt his food.
3. He should drink an abundance of milk, but no tea or coffee.
4. He may have candy and sweets at the end of a meal, but never between meals.
5. If hungry between meals, give bread and butter or a graham cracker and milk at 10:30 A.M. and 3:30 P.M.

Some Good Menus for the Child

Breakfast.

Breakfast should consist of:	(	Oatmeal
A well cooked cereal served	(	Cream of Wheat
with cream or top milk and a	(	Hominy Grits
little sugar, if desired.	(	Wheatina
	(	Farina
	(	Cornmeal

Dry prepared cereals are much less nourishing than cooked cereals and cost more. One or two slices of bread or toast (whole wheat preferred) and butter. Never use a butter substitute.

Milk - one glass.

To these may be added

Eggs , soft boiled, poached or scrambled, with or without butter.

Bacon

Fruit - oranges, grapefruit or stewed fruits, such as prunes, apples, figs, apricots, peaches.

Avoid pancakes, sausage, or other greasy fried foods.

Dinner.

Serve the heavy meal at noon, if possible.

1. 1 small piece of lean, fresh meat. Choice of:

Beef - roasted, broiled or stewed.

Mutton - roasted, broiled or stewed.

Fresh fish - baked or boiled.

Chicken - baked or stewed.

2. Two vegetables, one starchy, one nonstarchy.

Starch - potatoes, baked or boiled, hominy, rice, macaroni.

Nonstarch - spinach, carrots, turnips, onions, peas, string beans, lima beans.

Green vegetables - tomatoes, celery, lettuce, cress, radishes, and cabbage.

3. Whole wheat bread and butter, one slice.

4. Milk, one glass.

5. Simple dessert, such as rice, bread, tapioca or corn starch pudding; gelatine, ice cream, baked apple, stewed or fresh fruits, plain cake or cookies. Avoid rich pastries and hot breads. They are hard to digest.

Supper.

Choice of:

1. (a) Cereal cooked with raisins
(b) Milk toast
(c) Prunes or milk soups, made with milk, butter
or vegetables. Milk soups thickened with
vegetables, barley or rice.
(d) Cottage cheese
(e) Macaroni and cheese
(f) Eggs
2. Bread, butter, honey or jelly
3. Plain cookies, stewed fruit or simple desert
4. Milk, one glass

In order to stimulate the interest of the children in eating properly, the foods which are the best for them, we are asking that they keep for us, an accurate list of the food eaten daily. Your assistance in filling out the enclosed diet record will be greatly appreciated.

Sincerely yours,

Health Supervisor.

DIET BLANK ENCLOSED IN LETTER TO PARENTS

Name _____

	Breakfast	Lunch	Supper	School Milk
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				

Shortly preceding the October physical examinations, the following questionnaire was mailed to the parents of each child.

FORM III

PARENTS:

Name of child _____ School _____ Grade _____
 _____ Room _____
 Address _____

A physical examination of the above named child is to be made at the school. Will you kindly answer and return to us the following questions?

Does your child breathe through his mouth at night?

Is he restless at night?

Does he wet the bed?

Does he snore?

Do his bowels move daily at a regular hour?

Does he have frequent colds or sore throat?

Does he have frequent headache?

Do his eyes get red when he reads?

Does he complain of his eyes when he reads?

What is the date of the last successful vaccination?

Which of the following diseases has your child had?

Check them.

- | | | |
|-------------------|-------------|---------------|
| 1. Scarlet fever | 4. Smallpox | 7. Chickenpox |
| 2. Diphtheria | 5. Measles | 8. Typhoid |
| 3. Whooping cough | 6. Mumps | 9. Rheumatism |

This examination is not compulsory, but the school is working for your child's best interest and will appreciate your cooperation.

Health Supervisor.

The following form was used to report the results of the physical examinations to the parents.

FORM IV

TO PARENTS:

School _____ Room _____ Date _____

Mr. _____

Dear Sir:

Your child's greatest happiness and preaseasion is his health. Early attention to his body will preserve his health and help his school progress, and growth. This notification is sent to you in the interest of your child's health. The school physician reports below a condition needing your attention. Have this card signed by the physician who examines the child for the condition checked. Sign this card and return to the principal of the school as soon as possible.

Health Supervisor.

Physical examination seems to show that _____

Name

has defect checked below.

- | | |
|----------------------------------|------------------------------|
| 1. Defective eyesight_____ | 11. Defective joint_____ |
| 2. Eye disease_____ | 12. Decayed teeth_____ |
| 3. Defective hearing_____ | 13. Diseased gums_____ |
| 4. Ear disease_____ | 14. Teeth need cleaning_____ |
| 5. Defective nose breathing_____ | 15. Defective palate_____ |
| 6. Diseased tonsils_____ | 16. Skin disease_____ |
| 7. Enlarged cervical glands_____ | 17. Stooped shoulders_____ |
| 8. Lung disease_____ | 18. Poor posture_____ |
| 9. Heart disease_____ | 19. Other diseases_____ |
| 10. St. Vitus dance_____ | |

Height Weight normal Underweight Over weight Lbs.

%

TO PARENTS: Take this notice to your family physician.

TO FAMILY PHYSICIAN: The family physician is requested to fill out this notice after he has examined the child and to return it to the parents.

It is important that the following questions be answered for our records and to save the time of the health workers in following up the cases.

1. Diagnosis _____

2. What has been done to correct defect? _____

3. If nothing has been done when will something be done? _____

4. If nothing will be done why not? _____

Family Physician.

Parent.

TO THE PARENTS: The school health worker will call to see you as soon as possible after the examination.

TO THE PRINCIPAL: Please return this notice to the Health Education Department as it is important for our records.

In order to make the data as complete as possible, information was collected from the instructors and from the children, as well as from the parents. The physical examinations, and the information given by the children were the most prolific and valuable sources. The children, both consciously and unconsciously, revealed many facts which the parents might have hesitated to give. The following incident is offered in illustration of this: A certain child had been weighed and his extreme pallor, puffed eyes, and bearing of fatigue noted. He was questioned concerning his hours of sleep. He expressed his desire to obtain sufficient sleep and rest, but stated that it was impossible since he was taken by his father and mother "almost every night" to the second picture show, which started at nine o'clock.

The necessity for a complete physical examination of each child was recognized, and in February 1924, at the beginning of the study, forty-nine of the children were given a physical examination. This examination was made by two general medical practitioners; by a physician who did eye, ear, nose and throat work; and by a graduate nurse.

The physician's examination included inspection of the throat, heart, and lungs. The standardized school nurse's dental examination, and vision and hearing tests were made by the nurse. (The writer). Pyle¹ describes the method used in testing the vision and hearing.

The physicians were handicapped in making the general examinations, by the fact that no histories of the individual cases were available, and sufficient time was not consumed. For this reason, in October 1924, seven months after the first examination, the children were reexamined. At this time, twenty-two additional children, who had entered the school, were given the second examination, and a special investigation was made in each case, where it was thought to be indicated. The dental inspection and vision and hearing tests were made by the nurse as before, and the findings were checked with those of the preceeding examinations to guard, as nearly as possible, against error. A complete, and necessarily thorough, chest, abdominal, orthopedic, genital, and nose and throat examination was made on each child by a good diagnostician, aided by the nurse.

Since the height and weight index to health is used so extensively by child health workers, special emphasis was laid on this phase of the investigation. The children were weighed in indoor clothing at practically the same hour each month, and their weights were accurately recorded. The height was taken by having the child stand without shoes flat against the wall, with heels, shoulders, and head touching the wall, to which an accurate measure had been fastened. A right angled piece of wood was then placed firmly over the head of the child and against the measuring scale. This technique was similar to that suggested by the Bureau of Education, Washington, D.C., on their well known "Weight - Height - Age Table for Boys and Girls"; in order that the weights and measures might be compared with the 1923 revised Baldwin-Wood Tables. Nude weights were not attempted since even monthly nude weighings were impracticable at the time this study was made.

The children themselves kept daily records of their health habits by marking each morning in school the following health chart.

	M	T	W	TH	F
I. I washed my hands before each meal today. I cleaned my finger nails today.					
II. I brushed my teeth after breakfast. I brushed my teeth after supper.					
III. I drank water between meals.					
IV. I drank no tea or coffee today.					
V. I drank two glasses of milk today.					
VI. I ate some fruit today.					
VII. I ate one vegetable today besides potatoes.					
VIII. I ate some cereal today.					
IX. I was in bed with my windows open 11 hours last night.					
X. I had a bowel movement today.					
XI. I had a bath today.					

In an attempt to verify the information given in the health chart, personal conferences were held from time to time with the individual children and with the parents.

TABULATIONS AND DISCUSSION OF DATA

The following tabulations and discussion give the detailed information in regard to the physical health of the entire group of children.

THE MEDICAL EXAMINATION FINDINGS

TABLE I

Results of the Physical examinations

	Number	Percent of total
Children examined	71	100
Without physical defects	11	15
Needing treatment	60	85

TABLE II

Types of physical defects revealed by
the physical examinations

Physical defect	Nature of defect	(a) Number of defects	Percent of total
1 defects		169	100
decayed teeth	preventable-correctable	51	30.1
malnutrition	preventable-correctable	28	16.5
enlarged and hypertrophied tonsils	correctable	21	12.4
pharyngitis	preventable-correctable	11	6.5
enlarged submaxillary glands	correctable	5	2.9
enlarged cervical glands	correctable	3	1.8
widened shoulder	correctable	3	1.8
descended testicles	non correctable	2	1.2
deflected septum	correctable	2	1.2
enlarged turbinate	correctable	2	1.2
umbilical hernia	correctable	2	1.2
anemia	preventable-correctable	2	1.2
ring (impaired resonance)	correctable	2	1.2
flat chest	correctable	2	1.2
adherent foreskin	correctable	1	.6
thyroid enlargement	correctable	1	.6
adenoids	correctable	1	.6
flat belly	correctable	1	.6
rickets	preventable-correctable	1	.6
goose chest	non correctable	1	.6
venereal birthmark	correctable	1	.6
mouth tied	correctable	1	.6

(a) The total number of defects exceeded the total number of children since some of the pupils had more than one defect.

THE CHILDREN'S TEETH

Before reporting the findings of the dental examinations, it will perhaps be desirable to state briefly the standards used in judging the teeth. Teeth should be free from decay; they should be regular in placement; they should be free from stain; and occlusion, molar and anterior, should be perfect. The gums should be firm, pink and healthy.

The results of the dental examinations for the seventy-one children were as follows:

Normal mouth-----	16
Decayed teeth-----	24
Decayed, dirty and stained teeth----	14
Decayed and abscessed teeth-----	1

It was not possible to make a complete study of all the factors which might be responsible for the children's teeth, since this would include a history of the child from prenatal life to the present time. Certain findings for the group, which might perhaps have had a bearing on the condition of the teeth may be summarized as follows:

1. At least half of the children cleaned their teeth irregularly or not at all.
2. A faulty diet, that is, one containing tea and coffee, meat more than once a day; and lacking in cereals, fruits, vegetables and milk, was found in fifty-two percent of the cases. This fact is brought out more specifically, later.

Of the sixteen children having good, healthy teeth, but five were found to have a diet containing sufficient milk, fruits, cereals, and vegetables; while the remaining eleven had diets lacking in these essential foods. On the other hand, no child was found who had poor teeth with a satisfactory diet.

HEIGHT AND WEIGHT MEASUREMENTS

The comparison of the individual's height and weight to the age - height - weight tables, has been generally adopted as the best single index to health which we have today. It has become a generally established fact among pediatricians that an appreciable departure below average weight for height and age is evidence of poor health. The measurements of thousands of children have made possible the construction of average tables of weight for different heights and ages.

The tables constructed by Dr. Thomas Wood were made up from records of half a million boys and girls in many places. The Toronto Table was made from the records of sixty thousand children in Toronto, Canada. There is also a table that the city of Detroit has made from the measurements of its children. The most recent table is the one prepared by Doctor Baldwin and Doctor Wood from 36,000 measurements of boys and girls, most of whom were native born, with good heredity and environmental advantages. These children attended private schools and were the

recipients of school medical inspection, directed play, physical training and instruction in hygiene. For this reason, the new Baldwin Wood Table was used as a method of comparison in this study.

In making use of such tables, it must be borne in mind that the normal weight is not necessarily the average weight. A child may be of normal weight and still differ from the average. The average is a line, while the normal is a zone.

Growth is a law of health. Every normal child is taller and heavier at the end of a year than at the beginning. If this is not the case there is something wrong, and the matter needs a careful investigation by a competent and skilled physician, in order to locate the cause and prescribe the remedy.

It would be an easier task for those directing the health care of children, if all normal children grew at a regular rate. If this were true any child who did not conform to the standard could be easily recognized. Normal children, however, manifest great individual differences in the regularity of gaining. Some children gain with fair rapidity

regularity; while others remain stationary or even lose slightly, after which they gain with unusual rapidity. Some children fluctuate from month to month, now gaining, now remaining stationary, but eventually rounding out the year ahead of the previous year. For this reason there is no need for alarm in slight fluctuations in weight, from month to month. The factor of prime importance is that children should not lose weight or remain stationary, either in height or weight, for a prolonged period of time. The seasonal variations in gain complicate still further the problem of stating exactly how much a child should gain from month to month.

The results of a recent study of Italian children are reported by Dublin and Gebhart⁽²⁾. A capable pediatrician judged 34 per cent of the children as definitely malnourished, after a careful medical examination. This judgment was based on firmness of muscles, presence or absence of subcutaneous fat, color of mucous membranes, brightness or dullness of eyes, and the weight for height index. Of these ten per cent underweight but thirty-eight per cent were judged malnourished on the basis of the

ten per cent limit of under weight.

The following tabulations show the results of the weighings and the measurements of the children studied. In each case the age nearest the birthday was used in making the comparison to the age - height - weight tables in order to determine the average weight.

in February 1924 of a group of boys whose

ages ranged from 6 to 10 years.

Case Number	Age	Height in inches	Weight in pounds	Average wt. in pounds	Per cent above average wt.	Per cent below average wt.
21	6	47	41	50	0	18
1	6	48	57	52	9	0
5	7	48	51	53	0	3
18	7	47	51.25	50	2	0
37	7	50	66	58	13	0
51	7	48	53	53	0	0
22	8	51.5	66.5	62	7	0
53	8	52	64	64	0	0
20	8	52	64	64	0	0
70	8	51.5	64	64	0	0
24	9	52	59.5	64	0	7
50	9	49	58	55	5	0
63	10	51	67	61	9	0

The age - height - weight index to health
in February 1925 of the group given
in Table III

Case Number	Age	Height in inches	Weight in pounds	Average wt. in pounds	Per cent	
					Average wt. above	Per cent below average wt.
Year-Month						
21	7	49	54.25	55	1	0
1	7	50.5	67	59	13	0
5	8	53	58.5	67	0	12
18	8	50	61.5	58	5	0
37	8	54.75	82	72	13	0
51	8	48.25	56	53	5	0
22	9	54	75.5	70	7	0
53	9	54	71.75	70	2	0
20	9	55	76	72	5	0
70	9	54.75	75.5	73	3	0
24	10	55	68.5	73	0	10
50	10	51.25	62	61	1	0
63	11	53	77	67	13	0

The age - height - weight index to health
in February 1924 of a group of boys whose
ages ranged from 10 to 15 years.

Case Number	Age	Height in inches	Weight in pounds	Average wt. in pounds	Per cent above average wt.	Per cent below average wt.
Year-Month						
11	10 3	53	67	59	0	11.9
6	11 1	57	81	72	0	11
27	11 1	53.75	70	70	2	0
40	12	64.25	109	119	9	0
58	12 2	54	71	74	4	0
62	12 2	55	74	82	10	0
19	12 4	58.25	85	82	3	0
32	12 6	51	61	58	0	4.7
49	12 8	57	82	83.75	2	0
4	12 10	57	82	76.5	0	6
67	13 6	59.5	93	96	3	0
2	14 5	64.25	113	120	6	0
54	15	64.75	120	124.75	3	0

Case Number	Age	Height in inches	Weight in pounds	Average wt. in pounds	Per cent above average wt.	Per cent below average wt.
	Year-Month					
11	11 3	55.5	65.25	75	0	13
6	12 1	59	80.5	89	0	9.5
27	12 1	54.75	80	74	8	0
40	13	58.5	134	134	0	0
58	13 2	58	90	85	5	0
62	13 2	57.75	92	85	8	0
19	13 4	61.75	98.25	102	0	3
32	13 6	53.5	65	68	0	4
49	13 8	59.5	90	90	0	0
4	13 10	60.5	83.75	96	0	12.5
67	14 6	61	99	99	0	0
2	15 5	67.12	134	134	0	0
54	16	67.75	128	137	0	6

Monthly weights in pounds for a group of boys whose ages ranged from 6 to 10 years; and the yearly gain in pounds. The children were not weighed during the months of June, July, August, and September as school was not in session.

Case Number	Age in Feb. 1924	Wt. in Feb. in lbs.	Wt. in Mar. in lbs.	Wt. in Apr. in lbs.	Wt. in May in lbs.	Wt. in June in lbs.	Wt. in July in lbs.	Wt. in Aug. in lbs.	Wt. in Sept. in lbs.	Wt. in Oct. in lbs.	Wt. in Nov. in lbs.	Wt. in Dec. in lbs.	Wt. in Jan. in lbs.	Wt. in Feb. in lbs.	Yearly gain in lbs.
21	6	41	46	49.5	49.5	50.75	51	53.75	54.25	54.25	54.25	54.25	54.25	54.25	13.25
1	6	57	out	out	57	61.75	63	63	63.5	67	67	67	67	67	10
5	7	51	52	53	53	55.5	56.24	56	58.24	58.24	58.24	58.24	58.24	58.24	7.5
18	7	51.25	48	50.5	53	58	57	59	60.5	61.5	61.5	61.5	61.5	61.5	10.25
37	7	56	59	72	72	81.25	82	84	out	82	82	82	82	82	16
51	7	53.5	52.5	55	54	55.5	56.25	57.25	out	56	56	56	56	56	2.5
22	8	66.5	65.5	67	67	71	71	71	73.5	75.5	75.5	75.5	75.5	75.5	9
53	8	64.5	64	67	67	72	72	71.5	72	71.75	71.75	71.75	71.75	71.75	7.25
20	8	64.25	66	out	68	72.25	72.5	72.5	76	76	76	76	76	76	11.75
70	8	66.25	66.5	66.5	66.5	70.75	71	73.25	73.5	73.5	73.5	73.5	73.5	73.5	9.25
24	9	59.5	59.5	59	59.5	62	63.75	64	out	65.5	65.5	65.5	65.5	65.5	6
50	9	58	58	60	57	60.5	61.5	62	out	62	62	62	62	62	4
63	10	67	66	67	66	out	out	73.5	77	77	77	77	77	77	10

The age - height - weight index to health of a group of boys entering school in October 1924, whose ages ranged from 6 to 16 years.

October 1924

February 1925

Case No.	Age	Height in inches	Weight in pounds	Ave. wt. in pounds	Per cent above ave. wt.	Per cent below ave. wt.	Age	Height in inches	Weight in pounds	Ave. wt. in pounds	Per cent above ave. wt.	Per cent below ave. wt.
Yr-No												
30	6	43.25	40.25	41	12	0	6	3	45.25	49.25	6	0
9	6	45.25	55.5	46	19	0	6	7	49	52.5	0	4
8	6	46.5	49	48	2	0	6	8	49.25	53.25	0	3
36	6	47	50	50	0	0	6	8	49	57	6	0
42	6	47	50	50	0	0	6	8	48.25	48	0	0
61	7	45.75	43.5	48	0	3	7	8	51	57	0	6
15	7	48.75	55	55	0	0	7	8	54.5	67.75	0	4
13	8	53.5	64.75	67	0	3	9	1	59	70	1	0
34	9	48.5	55	52	5	0	9	3	49.75	55	12	0
14	9	53.25	75.75	67	13	0	10	1	53.25	78.5	0	5
33	10	53.75	64	70	0	5	10	3	57	66.25	0	3
38	10	56.25	75	77	0	2	10	9	57	77.75	0	2
69	11	56.25	77	77	0	0	11	4	57	79	0	6
12	11	60.75	83.5	96	0	7	12	3	62	94	0	10
46	12	61.25	82	97	0	5	13	1	62.25	89	0	0
52	12	53	70.5	68	2	0	13	1	54	72	1	0
56	16	66	140.5	123	9	0	16	9	66	140	6	0

The percentage of underweight of a group of boys whose weights were 10 per cent or more below

the average weight for their height and age in February 1924 and in February 1925, with a comparison with the average yearly gain in weight and height.

Case Number	Age	Based upon Emerson Tables				Based upon Baldwin-Wood Tables			
		Yearly gain in weight in pounds	Yearly gain in height in inches	Average		Per cent below av. wt. in	Per cent below av. wt. in	Feb. 1924	Feb. 1925
				yearly gain in weight in pounds	yearly gain in height in inches				
21	6	13.5	2	4.3	2.1	18	0		
5	7	7.5	5	5	2.8	3	12		
37	7	6.25	2.5	5.1	2.4	13	12		
24	9	7.5	3	5.7	1.9	7	10		
6	10	8.5	2	5.5	1.7	11	10		
4	12	7.25	3.5	10	2.4	6	12		

Yr.-No.

The age - height - weight index to health
in February 1924 of a group of girls whose
ages ranged from 6 to 9 years.

Case Number	Age	Year-Month		Height in inches	Weight in pounds	Average wt. in pounds	Per cent above average wt.	Per cent below average wt.
16	6	5	48	46	52	0	11	
44	6	5	47	50	50	0	0	
66	6	10	47	41	50	0	18	
25	7	1	51	56	58	0	5	
65	7	3	48	47	52	0	9	
39	7	7	46	47	48	0	2	
31	7	8	49	55	55	0	0	
26	8	3	48	55	52	5	0	
64	8	10	48	47	52	0	9	

The age - height - weight index to health
in February 1925 of the group given
in Table XI

Case Number	Age	Height in inches	Weight in pounds	Average wt. in pounds	Per cent		Per cent below Average wt.
					above Average wt.	below Average wt.	
Year-Month							
16	7 5	49.5	48.5	55	0		11
44	7 5	49.75	53.25	56	0		4
66	7 10	48	48.5	52	0		6
25	8 1	52	62	64	0		3
65	8 3	51	54	60	0		10
39	8 7	48.75	51.25	55	0		8
31	8 8	51	59.25	61	0		2
26	9 3	47.75	60	52	15		0
64	9 10	53.75	51.25	70	0		26

The age - height - weight index to health

in February 1924 of a group of girls whose

ages ranged from 9 to 13 years.

Case Number	Age	Height in inches	Weight in pounds	Average wt. in pounds	Per cent above average wt.	Per cent below average wt.
Year-Month						
71	9	51	70	61	14	0
3	10	53.5	61	69	0	11
23	11	56	74	74	0	0
45	11	57	86	82	4	0
57	13	57.25	89.75	84	7	0
43	13	60.25	92	97	0	5
29	13	63	106	110	0	3

The age - height - weight index to health
in February 1925 of the group given
in Table XIII

Case Number	Age		Height in inches	Weight in pounds	Average wt. in pounds	Per cent above average wt.	Per cent below average wt.
	Year	Month					
71	10		53.5	76.75	69	11	0
3	11	3	56.5	67.25	80	0	15
23	12	4	57.25	87.25	82	6	0
45	12	6	59.0	89.25	92	2	0
57	14	1	57.5	91	94	3	0
43	14	2	61.75	109	109	0	0
29	14	3	63.75	106.25	117	0	9

Monthly weights in pounds for a group of girls whose ages ranged from 6 to 9 years; and the yearly gain in pounds. The children were not weighed during the months of June, July, August, and September as school was not in session.

Case Number	Age in Feb. 1924	Wt. in Feb. pounds	Wt. in Mar. pounds	Wt. in Apr. pounds	Wt. in May pounds	Wt. in Oct. pounds	Wt. in Nov. pounds	Wt. in Dec. pounds	Wt. in Jan. pounds	Wt. in Feb. pounds	Yearly gain in lbs.
16	6 5	46	47	47	47	48	49	49.25	49	48.5	2.5
44	6 5	50.5	50	out	51	53	54	54.5	55.5	53.25	3.25
66	6 10	41	43	40	out	44.75	44	51	44.5	48.5	7.5
25	7 1	56	54.25	57	56.5	62	61.75	63	63	62	6
65	7 3	47	48	50.5	49	51.75	52.5	59.25	57.75	54	7
39	7 7	47	45	47.5	48	50.5	51.5	52	51.5	51.25	4.25
31	7 8	55	53.75	54.5	54.5	57.25	59	out	60	59.25	4.25
26	8 3	55	56	55	56	60	60.5	62.5	59.5	60	5
64	8 10	47	47	48	47	48.5	50.75	49.25	51	51.25	4.25

Monthly weights in pounds for a group of girls whose ages ranged from 10 to 15 years; and the yearly gain in pounds. The children were not weighed during the months of June, July, August, and September as school was not in session.

Case Number	Age in Feb. 1924	Wt. in Feb. pounds	Wt. in Mar. pounds	Wt. in Apr. pounds	Wt. in May pounds	Wt. in Oct. pounds	Wt. in Nov. pounds	Wt. in Dec. pounds	Wt. in Jan. pounds	Wt. in Feb. pounds	Yearly gain in lbs.
	Yr.-Mo.										
71	9	70	70	72	71	75.75	76.	out	77.25	76.75	6.75
3	10	61	61.5	61	61	65	64.75	65.5	66.5	67.25	6.25
23	11	74	74	74	75	84	82	85.5	84.25	87.25	13.25
45	11	86	86	86	85	85	85.5	87	89.25	89.25	3.25
57	13	89.75	89	out	85	95.75	91	92.5	91.75	91	1.25
43	13	106	110	out	out	109.75	111	116.5	115	106.25	.25
29	13	92	94	96	95	107.75	110.75	111.75	109.5	109.5	17.5

The age - height - weight index to health of a group of girls entering school in October 1924, whose ages ranged from 6 to 13 years.

October 1924

February 1925

Case No.	Yr-Mo		Height in inches	Weight in pounds	Ave. wt. in pounds	Per cent		Height in inches	Weight in pounds	Ave. wt. in pounds	Per cent		
	Yr	Mo				above ave. wt.	below ave. wt.				above ave. wt.	below ave. wt.	
28	6	6	44.75	52	45	15	0	6	9	47.5	50	10	0
48	6	6	47	52	50	4	0	6	9	50	53	0	5
60	6	11	43.5	42	42	0	0	6	7	45	48.5	7	0
47	6	11	44	42	42	0	0	7	2	47	42	0	15
41	7	7	44.5	47.75	45	6	0	7	10	46	47	0	0
59	7	7	48.5	55.75	52	7	0	7	10	50	58.5	2	0
10	8	10	48.75	60	55	9	0	9	1				
17	11		50.25	71.25	79	0	9	11	3	57	76	0	7
35	11	7	52	76.5	67	14	0	11	10	58	82	0	4
55	13		60.5	94.5	97	2	0	13	3	60.5	94.5	2	0

The percentage of underweight of a group of girls whose weights were 10 per cent or more below the average weight for their height and age in February 1924 and in February 1925, with a comparison with the average yearly gain in weight and height.

Case Number	Age	Based upon Emerson Tables				Based upon Baldwin-Wood Tables			
		Yearly gain		Average		Per cent		Per cent	
		in weight in pounds	in height in inches	yearly gain in weight in pounds	yearly gain in height in inches	below av. wt. in	below av. wt. in	below av. wt. in	below av. wt. in
Yr.-Mo.									
16	6 5	2.5	2.5	4.0	2.3	11	11	11	11
66	6 10	7.5	1.0	4.8	2.1	18	18	6	6
65	7 3	7	3	4.8	2	9	9	10	10
39	7 7	4.25	2.75	5.2	2.1	2	2	8	8
64	8 10	4.75	5.75	5.4	2	9	9	2.6	2.6
3	10 3	6.25	3.5	7.2	2.1	11	11	15	15
29	13 3	0.75	0.75	8.9	1.7	3	3	9	9

The report on the height and weight index to health of the children in this particular study is as follows. According to the method which classifies children who are ten per cent under weight as malnourished, fifteen of the seventy-one or twenty-two per cent of the children belong to this class. Each of these children had one or more of the other signs of malnutrition. None of the children who were ten per cent below weight for their height and age, were found to be in good health and well nourished. On the other hand, thirteen of the children who were up to or even above the average weight some of ten per cent proved to be malnourished when the other recognized tests in addition to weighing were used. Wood³ gives signs of malnutrition to be:

Bodily:- paleness, lines under eye, flabby muscles, round shoulders, projecting (winged) shoulder blades, stooping posture, curvature of spine, prominent abdomen, weak feet.

Nervousness:- restlessness, irritability, forgetfulness, timidity, inattention.

General :- poor resistance to disease.

Of the group judged to be malnourished by the signs mentioned above, nine of the children were somewhat underweight for their age and height; one being two per cent; one, three per cent; three, four per cent; two, five per cent; one, six per cent and one, seven per cent below the average. Four of the children were above the average for their age and height. Of those above the average weight, one was three per cent, two were five per cent and one was six per cent above the average for their age and height.

DIET AT TIME OF STUDY

The milk consumption for the group was fairly good as all but twenty-seven of the children had at least a pint a day; and seventeen of the seventy-one children averaged a cup daily. Milk was not included in the diets of ten of the children. Fruit was well liked by the entire group and was eaten daily by forty-two of the children, three times a week by twenty-six children and was found entirely lacking in but three cases. Meat was a very popular form of food and in a majority of cases was eaten to excess; since twenty-eight of the children ate it daily, thirty-six ate it two times a day, two ate it three times a day and in but five cases was it eaten less than three times a week. Cereals were also fairly well liked, and but eleven children failed to include them in their diets. They were eaten daily by forty-one children and three times a week by nineteen. The vegetable showing was the most unsatisfactory since only thirty-two children had a second vegetable daily in addition to potatoes. Thirty-seven children, however, had vegetables at least three times a week and all

of the children expressed their liking for vegetables with the exception of two. Coffee was used by seventeen children daily; four drank it two times a day and three had it with each meal. Sixty-one children ate between meals. The typical foods eaten were bread, butter and jam or fruit and cookies. All of the children liked sweets and sixty-nine of them ate candy between meals. Of the entire number of children, twenty-five had candy daily, sixteen ate it three times a week and thirty ate it at least once a week.

A number of common and typical dietaries of the group are as follows:

BREAKFAST

- Coffee and pan cakes.
- Milk and cereal.
- Bread and coffee.
- Meat, bread and and gravy.
- Bread and milk.

LUNCH

- Bread, butter, meat and doughnuts.
- Bread, butter, potatoes and gravy.

DINNER

Eggs, fried potatoes, bread and butter.

Meat, potatoes, gravy, bread and butter.

A summary of the dietary conditions shows the chief faults in this respect to be a diet inadequate in kind in the majority of the cases due to an absence of vegetables, milk and fruits; and an excess of meat, sweets and fried foods.

The group of poorly nourished children may be further enlarged when type of food is taken into consideration. A survey of the dietaries showed fifty-two per cent of the entire group to be suffering from faulty food habits. A diet was judged inadequate and at fault if it contained tea or coffee, or meat more than once a day; and if it were lacking in cereals, fresh vegetables or milk.

GENERAL HEALTH HABITS

In addition to the study of the food habits, other health habits of the group were studied. The majority of the children was found to secure adequate sleep since but eight received as little as eight hours, fourteen secured nine hours, nineteen secured ten hours, and thirty averaged eleven hours of sleep each night. The care of the teeth was very poor since forty-three of the entire group brushed their teeth irregularly or not at all; while only eleven brushed their teeth two times a day, and seventeen children brushed them daily. A tub bath was taken daily by one child, weekly by sixty-two children, three times a week by five, two times a week by two and but twice a month by one child.

CONCLUSIONS

Some practical conclusions may be drawn from this study.

1. In the organization of school health work, complete yearly physical examinations of each child are necessary in order to detect the physical defects and to secure their correction. Such an examination should include an eye, ear, nose, throat, dental, chest, abdominal, genital and orthopedic examination.
2. Since health habits have a far reaching influence upon future health, a complete record of both past and present health habits should be taken to supplement the physician's examination. A knowledge of the child's health habits will also make the physician's examination more accurate.
3. There is real danger of placing undue reliance upon the use of the age - height - weight tables as a single index to health. It is of great value as one of the steps in determining a child's physical condition; but does not take the place, in any way, of a thorough physical examination.

4. More adequate records in child health work should be kept in order that the school may have continuous records available for study from year to year.
5. There is a great need for a well organized program of health instruction which will fit the individual needs of the particular group to be benefitted.
6. There are many factors contributing to the health of children, and other measurements than mortality and morbidity rates must be provided.

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