

South Dakota State University
**Open PRAIRIE: Open Public Research Access Institutional
Repository and Information Exchange**

Bulletins

South Dakota State University Agricultural
Experiment Station

4-1-1931

Rural Health Situation in South Dakota

W.F. Kumlien

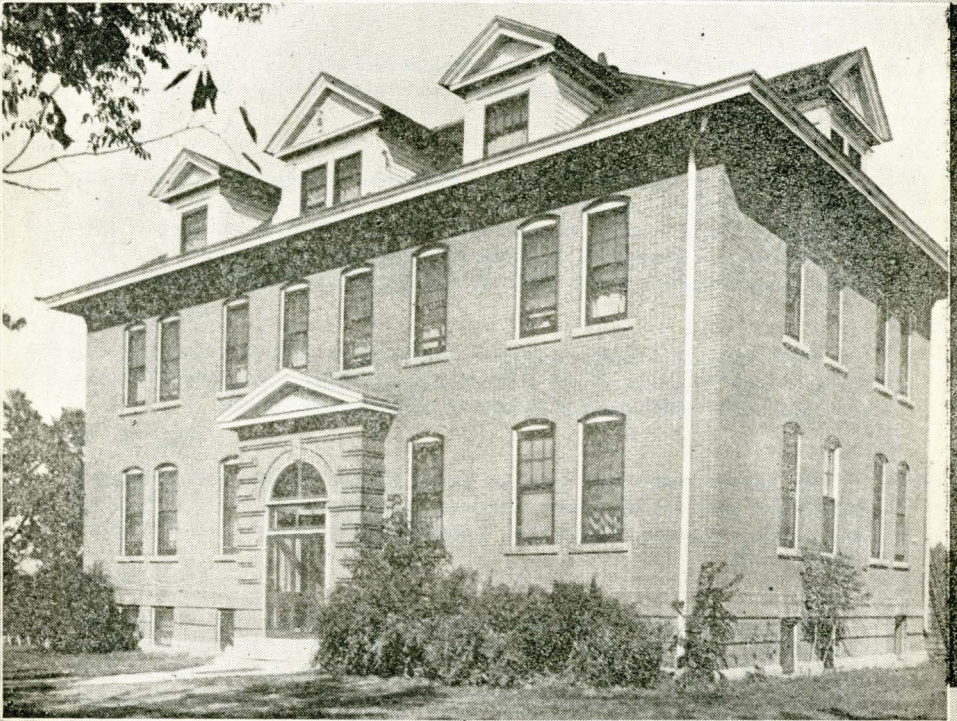
Follow this and additional works at: http://openprairie.sdstate.edu/agexperimentsta_bulletins

Recommended Citation

Kumlien, W.F., "Rural Health Situation in South Dakota" (1931). *Bulletins*. Paper 258.
http://openprairie.sdstate.edu/agexperimentsta_bulletins/258

This Bulletin is brought to you for free and open access by the South Dakota State University Agricultural Experiment Station at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Bulletins by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact michael.biondo@sdstate.edu.

RURAL HEALTH SITUATION IN SOUTH DAKOTA



BROOKINGS HOSPITAL—AN IMPORTANT UNIT IN
BROOKINGS COUNTY HEALTH FACILITIES

DEPARTMENT OF RURAL SOCIOLOGY
AGRICULTURAL EXPERIMENT STATION
SOUTH DAKOTA STATE COLLEGE OF
AGRICULTURE AND MECHANIC ARTS
BROOKINGS, S.D.

DIGEST

One of the most serious obstacles encountered in making a comparative statistical health study of South Dakota is the fact that our state is not in the United States Vital Statistics registration area. This difficulty is now in the process of being corrected.

Page 16—18

There are a total of 604 regularly licensed physicians in the state. This makes an average of one physician per 1095 people as compared to 726 people per physician for the United States.

Page 19—20

A considerable number of advantages in health services are shown to exist in the 14 urban counties as contrasted with a like number of rural counties.

Page 20

There are a total of 58 general hospitals serving the public in the state. Thirty-eight are owned and operated privately, 18 by churches, and one in Faulk county, as a county hospital. In hospital service only 15 counties can qualify as meeting the standard requirements for adequate hospitalization as set forth by the American Hospital Association.

Page 20—24

With respect to farm sanitation, food habits, and the prevalence of diseases and disorders, South Dakota farm families would seem to compare favorably with similar groups in other nearby states.

Page 29—38

In health costs the average farm family spends approximately \$64.00 per year for all health services, including doctors' fees, hospital and nursing charges, dental fees, together with unprescribed drugs and optical work.

Page 42—51

A majority of farm families replying in the survey stated that they were fairly well satisfied with their local health service, except those living in the small town of Bruce. A majority of the families in both town and country have had a family doctor for an average of 9.33 years. The average distance traveled by farm families for medical assistance was 12.93 miles.

Page 52

Among 1395 Brookings county elementary school children, physical defects of the throat, teeth, posture, skin, nose, eyes, and heart were the most common. With respect to the fourteen most common defects, the rural children made a better showing than the town children in all points but three.

Page 52—56

Of the various rural health problems as compared to those in town, the most serious was the spatial and economic handicap of living several miles distant from health service centers. The burden of this disability fell almost entirely on the rural family.

Page 57—59

THE RURAL HEALTH SITUATION IN SOUTH DAKOTA

W. F. KUMLIEN¹

PART I

The New Health Era as Related to Rural Life in South Dakota

The fact of our living in a new health era in the United States at the present time is quite generally conceded.

A few of the significant achievements indicating that this stage has been reached are:

The rapid development and growth of a science of preventive medicine.

The improvement and gradual diffusion of modern health facilities throughout all parts of the United States.

Very definite advances in the conquest of disease.

Death Rates for Registration Area

Infant Mortality Rates in Registration Area

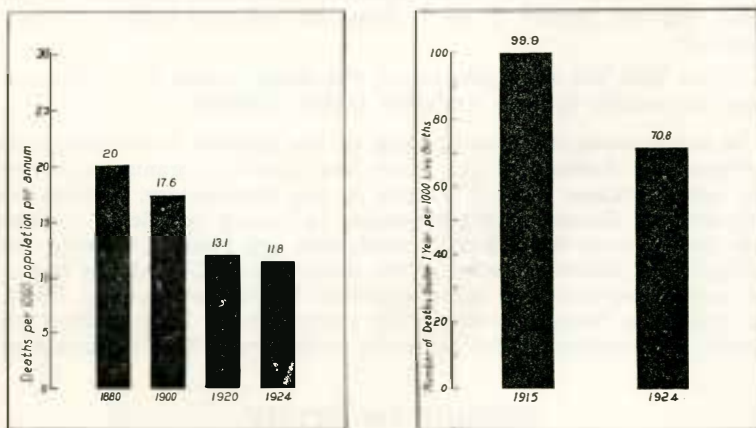


Figure 1—Showing the rapid decrease by periods in the general and infant death rates in the registration area of the United States.

The establishment of a well-organized federal birth and death registration area.

A rapid but consistent lowering of the general death rate, and infant mortality rate. (See Figure 1)

An appreciable lengthening of the average span of life. (See Figure 2)

¹ The first year of this study (1925) was made in cooperation with the Section of Rural Life Studies, Bureau of Agricultural Economics, U. S. D. A.

While the above constitute only a few representative indices in the norm for improved health conditions throughout the United States, each section may well occasionally apply these and other criteria as measuring sticks in analyzing its own health situation. Making the application specifically to South Dakota the following are perhaps typical questions that at once arise.

Is South Dakota sharing equally with the rest of the country in general health progress? Have the above health gains been diffused among the rural people of the state to the same extent as among the town and urban areas?

How well developed are our state, county, and local health organizations?

Are modern health agencies available and easily accessible to all of our people? Are they centrally located and well distributed? Are all classes of people making a reasonable use of these agencies? Are the costs reasonable?

How do our health statistics compare?

Is there anything peculiar in our health conditions as contrasted with other middle western states?

Are there any special health problems in the rural sections as contrasted with our towns? If so, is there any practical solution to these problems?

It has been the main purpose of this study to find as complete an answer as possible to these and other similar questions.

In consequence, the general plan of the bulletin in describing the conditions and findings of the study, has been to organize it around three related phases. Part I is more or less introductory, showing the relationship of the new health movement as applied specifically to rural South Dakota conditions. Part II deals with the location, number, and distribution of health agencies in the state. Part III attempts to describe more intensively the more important health conditions in Brookings county as being typical of the eastern South Dakota situation, together with suggestions for correcting certain rural health inequalities.

METHOD OF STUDY

Several different methods have been employed in making this study.

First of all, a fairly careful perusal was made of the published reports and other literature issued during the past five years by the main health agencies operating in the state. The agencies referred to include the State Board of Health with its various branches, certain extra governmental and voluntary health organizations that conduct health projects in cooperation with state and local agencies, and hospitals. In additions to this, records, articles, and reports of meetings, have been examined from the South Dakota medical and dental associations.

RURAL HEALTH SITUATION IN SOUTH DAKOTA

Parents	Nationality	Age	Birthplace	Education	Marriage	Lived in town (where)	When
Man							
Woman							

Water supply: Well_____drainage_____platform_____distance from pollution_____Excretia disposal:
sewerage, cesspool, septic tank: outlet_____privy_____flyproof_____Garbage disposal: collected, burned, buried, left on
ground, fed to fowls or hogs_____Barnyard manure disposal_____Fly control _____Milk
supply: purchased, private_____Tuberculin tested_____

[illegible]

Care at childbirth: Mother?-----Child?-----School Children Examined?-----Foot difficulties:
 bunions-----Corns-----Fallen arches-----Know points in buying shoes?-----
 Trouble obtaining them?-----

[illegible]

Obverse (front) side of questionnaire card used in interviewing families for the health survey in four townships and two small towns in Brookings County.

Unprescribed remedies from	Drug Store		Medicine Wagon		Mail Order		Days lost last year because of illness	Adults	Children
	No.	Cost	No.	Cost	No.	Cost			
1. Cathartics and laxatives							Family doctor?-----	How long-----	
2. Coughs and colds							Distance away-----	Satisfactory-----	
3. General tonics							Rates (mileage)-----		
4. Headache							Health service adequate-----		
5. Kidneys							Total health cost: Doctor-----		
6. Skin disease remedies							Dentist-----	Nurse-----	Drugs-----
7. Foot remedies							Hospital-----	Optical-----	
8. First aid remedies							Who fitted glasses?-----		
							Attitude towards Health Agencies-----		

Effect of sickness on life of the family: Social-----Income-----Education-----No. house rooms-----
 Ventilation-----Lighting-----Heating-----Running water-----Telephone, distance from-----
 power driven washer, oil stove, vacuum cleaner, radio, phonograph, piano, organ, kitchen sink, sewing machine, refrigerator, bathroom, shade
 trees, fenced yard, lawn, shrubs, flowers, garden, Who cares for?-----Vegetable storage: where?-----How
 -----satisfactory-----Canning: water bath, steam pr., oven-----

No. in family who eat	Lettuce	Raw Cabbage	Tomatoes raw, cooked	Celery	Cooked Vegetables	Greens	Milk	Cereals Cooked
Adults								
Children								

Foods served: daily: qts. milk-----pts. cream-----Weekly: pints cottage cheese-----pounds other cheese-----pounds sugar pounds but-
 ter-----pounds other fats-----Are children getting: hot school lunch-----fussy about their food-----eating
 vegetables-----drinking milk-----No. times following groups are served weekly.

Veg. (not pot.)			Tomatoes		Fruits			Meats		Other	Eggs	Cereals							
Cooked	Leafy	Raw	All	Kinds	Cooked	Raw	Chicken	Fish				Dark	Br.	Cooked	Prepared	Hot	Breads		
W	S	W	W	S	W	S	W	S	W	S	W	W	S	W	S	W	S		

Remarks: -----

Reverse (back) side of questionnaire card used in interviewing families for the health survey in four townships and two small towns in Brook-
 ings county.

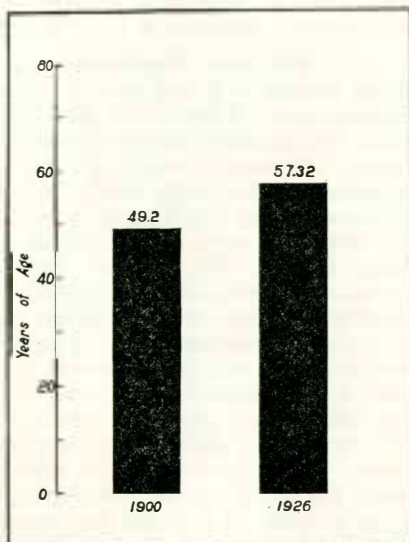
Average Span of Life in Registration Area

Figure 2—Increase in the average span of life in the registration area of the United States. (1900-1926)

A second method has been to visit personally representatives of various types of health agencies in Brookings county and the state at large. During these visits an attempt was made to get both a first-hand impression and a cross-section viewpoint of the health problem in various communities.

Third, questionnaires were sent out to a representative number of additional doctors, dentists, and hospital superintendents, to get their reaction to certain health questions not ordinarily covered in reports.

Last, but most important of all, has been to use the survey method. Two separate health surveys were made in Brookings county. The first was conducted by the writer and his assistant, as a house to house survey in four representative townships and two small towns in Brookings county. The schedule used in this survey is shown in Figure 1.

The other survey was conducted by Doctor M. W. Koenig, under the auspices of the State Board of Health and the Brookings County Health Association.¹ In this study Doctor Koenig gave a fairly thorough physical examination of the upper part of the body of all the children in the elementary and high schools in the county, with the exception of those residing in the city of Brookings. Most of the health tables used in this study are summaries from the schedules used in these two surveys.

¹ The writer is a member of the executive committee of the Brookings County Public Health Association, and thus has had access to all the data collected.

DESCRIPTION OF AREA AND PEOPLE

As a background to health conditions in the state there are unquestionably certain physical, historical, economic, and social factors that have exerted a powerful influence in their determination.

Physical Features

Physically, South Dakota is a vast area of rectangular shape consisting of 77,615 square miles. It ranks fourteenth in size among all the states of the union. The present economic interests of the state are primarily agricultural. However, because of widely divergent topographical features eastern and western South Dakota are considered as two distinct areas, separated by the Missouri river.

Western South Dakota is more or less broken in surface and with an excellent drainage system. The soils are made up of a variety of clays, overlaid to some extent with alluvial loam but lacking in vegetable mould. The agriculture of this section consists principally of stock raising. Probably the chief limiting factor in agriculture in this part of the state is the amount of rainfall. It varies from 12 to 17 inches, which in most years is insufficient to raise good crops.

Eastern South Dakota is a glaciated region, with a soil of deep alluvial loam. The surface is slightly rolling, but may properly be termed a prairie-plain. The agriculture of this region is diversified.

Brookings county lies about midway north and south in the extreme part of the state. In general, its physical features, economic resources, material and social development, make it a fairly typical county of eastern South Dakota.¹ Its shape is rectangular, and in size it is 33½ miles long and 24 miles wide. It contains twenty full-sized townships and three others that are irregular in shape and size.

Historical Background

South Dakota is one of the ten youngest states of the union, having been admitted to statehood in 1889. While this region had operated under a territorial status of varied auspices² since 1803, it really was not settled to any extent by the whites until after the close of the Civil War.³ The period of most rapid settlement for this region occurred between 1880 and 1890. In the latter census the population had grown to 358,600. With respect to age, it should be noted that Brookings county is quite typical of eastern South Dakota. The first permanent white settlement was established in 1869, although the county as a whole was not settled until the period between 1877 and 1880. The federal census of 1880 credits the county with 4,965 people.

Economic Status

As considerable has already been written about economic conditions in South Dakota through publications of the South Dakota Experiment

¹ Various checks have been made to verify this point with respect to soil, climate, land values, population data, towns, social institutions etc.

² It was a part of the Louisiana purchase in 1803, known as Louisiana territory (1805-1812), Missouri territory (1812-1834), Michigan territory (1834-1836), Wisconsin territory (1836-1838), Iowa territory (1838-1849), Minnesota territory (1849-1861) Dakota territory (1861-1889).

³ The federal census of 1870 gives the population as 11,776 for that portion of Dakota territory, later known as South Dakota.

Station. the writer wishes simply to refer to them,¹ and to call attention to a few additional factors that have a vital bearing on the health situation.

First of all it is worthy of note that South Dakota is one of five remaining states in the union (See Figure 3) with more farm people in its population than live in villages, towns, and cities.²

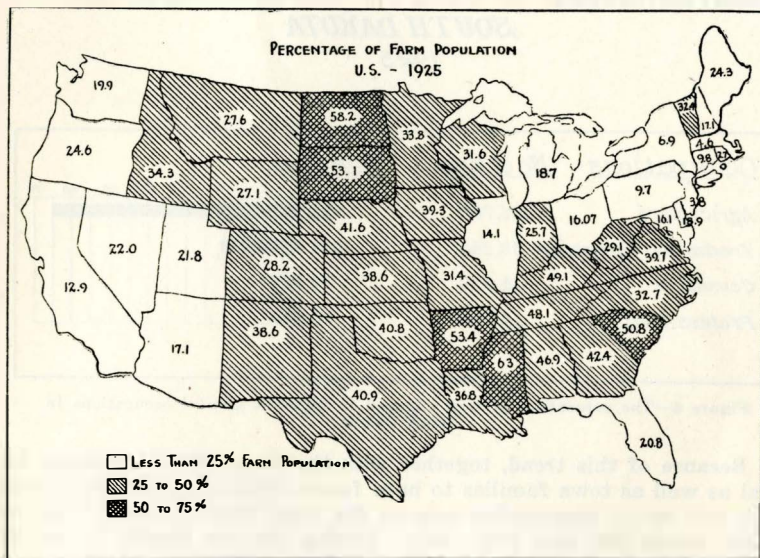


Figure 3—The percentage of the population living on farms in each state of the Union.

The number of farms in the state is gradually increasing, there being 83,138³ in 1930 in contrast to 74,637 in 1920.

A corollary of this point may be found in distribution of men engaged in useful occupations in South Dakota. Figure 4 shows that 65 per cent of these men are engaged in farming.

The rate of farm tenancy is also slightly on the increase as evidenced in Figure 5. By 1925 the rate had risen to 41.5 per cent, while the average for the west north central states as a whole was 37.8 per cent.

According to the 1930 census there are 1,991 farms in Brookings county. Between 1920 and 1925 there was a net gain of 123 farms, but a loss of 23 from the latter number between 1925 and 1930.

In this connection it should be noted that certain rural townships of Brookings county are now rapidly approaching maturity,⁴ at least under the present system of farming. Some 92.6 per cent of all the

1 The reader is especially referred to bulletins 226, 232, 234, 235, 238, 244, and 249, published by the Agricultural Economics Department, Experiment Station, South Dakota State College.

2 The other four states are North Dakota, 52.8%, Arkansas, 53.4%, Mississippi, 63%, and South Carolina, 50.8%. (Federal Agricultural Census of 1925)

3 Preliminary 1930 census.

4 The maximum of population numbers that can make a living comfortably on individually operated farms, according to present standards and under the present system of farming.

arable land of the county is in farms, and the average size of these farms has now reached about as low a point as will utilize most economically the available capital, labor, and equipment of the average farm family.¹

MEN ENGAGED IN USEFUL OCCUPATIONS IN SOUTH DAKOTA 1925

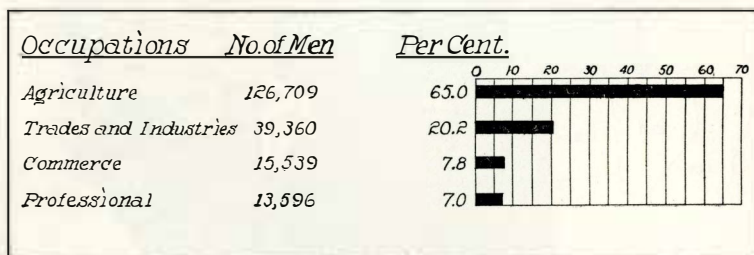


Figure 4—The percentage of men engaged in different gainful occupations in South Dakota.

Because of this trend, together with the very definite tendency for rural as well as town families to have fewer children, it is believed that there will be no appreciable gain in the total farm population in the county within the next few years. During the last decade 11 out of 23 townships have decreased in population, while four of the seven small towns have declined in numbers.

The average size of farms has decreased slightly since 1920. In 1920 the average size was 249.7, while in 1925 it was 232.9.

TABLE 1—TOTAL NUMBER OF MAJOR FARM ANIMALS BY TEN YEAR PERIODS IN BROOKINGS COUNTY

Year	Horses	Milk Cows	All other Cattle	Sheep	Swine	Mules	All Poultry
1925	13,511	12,079	33,903	19,199	71,366	424	223,997
1920	15,214	11,974	33,073	16,421	49,610	300	192,083
1910	13,142	11,105	18,755	37,051	19,288	254	144,805
1900	10,927	6,527	12,075	18,426	23,552	152	101,177
1890	7,014	6,776	10,862	8,218	5,102	196	53,193
1880	1,164	1,814	2,172	759	957	97	7,556

TABLE 2—TOTAL ACREAGE AND PER CENT DISTRIBUTION OF SEVEN MAJOR CROPS IN BROOKINGS COUNTY BY TEN YEAR PERIODS

Year	Acreage in Farms	Corn	Oats	Wheat	Barley	Rye	Flax	Potatoes
1925	468,996	132,956	121,729	770	8,796	3,506	10,596	4,517
1920	472,237	62,438	87,397	34,787	44,356	5,692	4,040	6,444
1910	473,816	35,800	50,735	58,351	59,534	839	12,248	1,871
1900	455,145	26,572	40,084	171,278	23,467	424	8,419	1,098
1890	333,838	6,816	23,105	75,237	1,616	271	34,701	1,032
1880	156,832	565	1,907	6,213	400	11		

¹ Rogers and Elliot, "Types of Farming in South Dakota," South Dakota Experiment Station, Bulletin 238, 1929, P. 25.

The assessed average valuation per acre in the county has also declined from its high peak of \$74.23 per acre in 1920 to \$54.79 per acre in 1930. This change reflects a general decline over the state as a whole and indicates the low income yielding ability of farm lands during the past nine years.

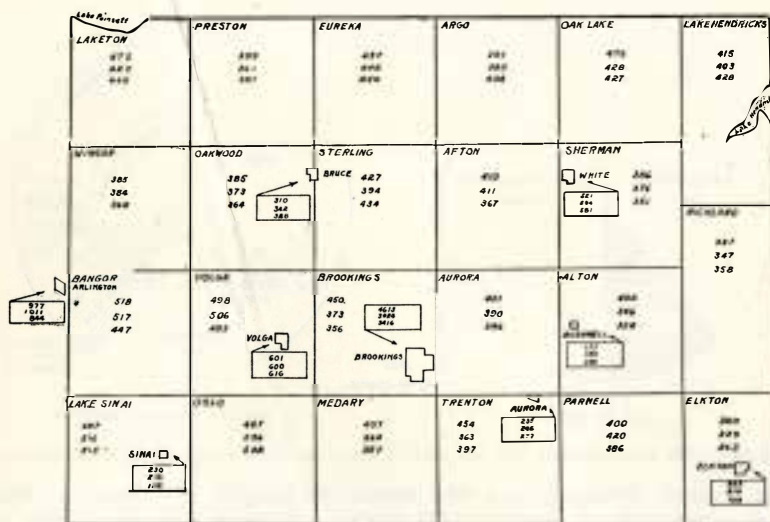
The farm enterprises found most profitable during recent years have been a combination of producing hogs and cattle, or in hogs and dairying. There has also been a noticeable decline in the production of grain to be sold directly to the market. Tables 1 and 2 show the trends in livestock and crop production from 1880 to 1925.

In connection with changes in farming methods it is particularly noticeable to see the decline in the amount of hired help used in operating farms in the county. Table 3 shows that approximately only 25 per cent of farmers in four townships hired help for as much as from six to 12 months during the year. This tendency to decrease the amount of hired labor has taken place largely because of the introduction of large scale machinery.

TABLE 3—THE AMOUNT OF HELP USED IN OPERATING FARMS IN FOUR BROOKINGS COUNTY TOWNSHIPS

	By the Month						Special Help		No Help Outside of Family	
	1-3 months		3-6 months		6-12 months					
	Owners	Tenants	Owners	Tenants	Owners	Tenants	Owners	Tenants	Owners	Tenants
Argo Township		1	5	2	6	3	2	2	22	31
Oakwood Township	4	4	3	3	6	2	1	1	27	19
Oslo Township	2	4	1	2	12	4	2	3	35	26
Parnell Township	5	3	8		4	12	2	1	16	23
	11	12	12	7	28	21	7	8	100	99

Compared to the rest of the state, Brookings county has a relatively high tenancy rate. (See Figure 5) The tenancy rate in turn has tended to lower the average age level of farmers and their families together with their length of residence on the farm now operated.



Upper Figure - Farm Population for 1925

Middle " " " " " 1920

Lower " " " " " 1915

Boxed Figures - Incorporated Town Population in the same order.

Figure 6—Population changes in various unit areas of Brookings County. (1915-1925)

The density of population in Brookings county is 21.3, compared to 9 for the state as a whole. The rate of density has increased constantly with each federal census since the first one taken in the county in 1880.

The relative proportion of racial stocks or nationalities¹ in a county's population exerts considerable influence on its health conditions. The three most populous strains in Brookings county list their ancestry as American, 33.84, Scandinavian (mostly Norwegian), 29.37, and German, 11.59 per cent. (See Figure 7) Some 54.4 per cent or slightly more than half of the county's population are native born South Dakotans, 38.1 per cent have moved in from other states, and 11.5 per cent are foreign born. These figures compare favorably with the state as a whole, the main nationality strains of which are American, 31.72 per cent, German, 18.81 per cent, and Scandinavian, 14.7 per cent. As to place of birth, 48.6 per cent of the state's population are native born, 41.55 per cent have come in from other states, while 10.39 are foreign born.²

The extent of education of the population, eighteen years and over, as shown in table 4 reveals a comparison between Brookings county and the state of South Dakota for 1925, giving a decided advantage in all respects to the former. Particularly noteworthy is the low rate of illiteracy in Brookings county, (.7 per cent), despite its slightly higher percentage of foreign born than is found in the state as a whole. This can probably be accounted for in the relatively high percentage of Scandinavian people³ who come from countries having a correspondingly

1 The term nationalities is used here in the popular sense of denoting fairly recent descent from certain ancestral strains in the Old World.

2 State census of 1925.

3 Insurance companies also quite generally recognize the desirability of North European stocks as a preferred health risk.

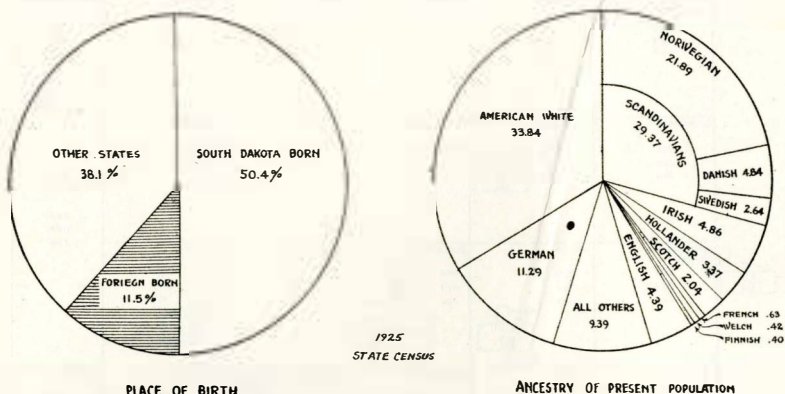


Figure 7—The place of birth and ancestry of the present population of Brookings county.

low rate of illiteracy, and who believe thoroughly in education. The high percentage of people in the county who have attended college is doubtless due to the influence of State college being centrally located within its boundaries.

TABLE 4—THE EXTENT OF EDUCATION OF MALES AND FEMALES
EIGHTEEN YEARS AND OVER IN BROOKINGS COUNTY—(1925)

	All Brookings County Population 18 years of age and over		All South Dakotans 18 years of age and over	
	Number	Pct. of Total	Number	Pct. of Total
Dropped out of school in or with the Grades-----	7,430	71.0	292,503	78.5
Dropped out of school in or with High School-----	1,560	14.9	51,927	13.9
Dropped out of school in or with College-----	1,469	14.0	26,652	7.1

One other population factor bearing on health conditions should be noted here, and that is the number of farm people who sometime or other have lived in town. Table 5 compares the farmers and their wives in this respect, in three different townships in the county. The wide variation in the experiences of farmers and their wives in these three townships is probably due to the dominance of certain nationality strains.¹

TABLE 5—THE PERCENTAGE OF FARM PEOPLE THAT HAVE LIVED IN
TOWN FROM THREE TOWNSHIPS IN BROOKINGS COUNTY

	Oakwood		Oslo		Parnell	
	Men	Women	Men	Women	Men	Women
Owners -----	52.8	51.3	11.4	12.2	3.4	3.7
Average number of years	10.4	13.3	2.5	2.5	6.	6.
Tenants -----	40.	58.6	8.6	8.6	2.7	3.1
Average number of years	5.6	6.7	15.	15.	.5	.5

¹ Oakwood township is made up largely of mixed nationality strains and with a history of considerable change in population. Oslo township has been predominately Norwegian since its settlement, while Parnell township is predominately Irish. The social and economic life of the last two named townships has been relatively more stable than Oakwood.

PART II

GENERAL FACTS ABOUT HEALTH AGENCIES IN SOUTH DAKOTA

Pivotal to the collective success of local and county health agencies operating in a state is the form and manner in which the overhead or supervisory organization functions.

State Supervision of Public Health

Potentially South Dakota has an effective well set up central organization in its state board of health. Actually, however, the state legislatures have not given consistent and adequate financial support to the state board of health, so that it can function in the manner and to the extent that its task would seem to warrant.

Figure 8 gives a schematic plan of the working relationships between the various health agencies in the state. Very naturally the regulatory health work and much of the preventive work of the state,

ORGANIZATION OF THE SOUTH DAKOTA HEALTH AGENCIES

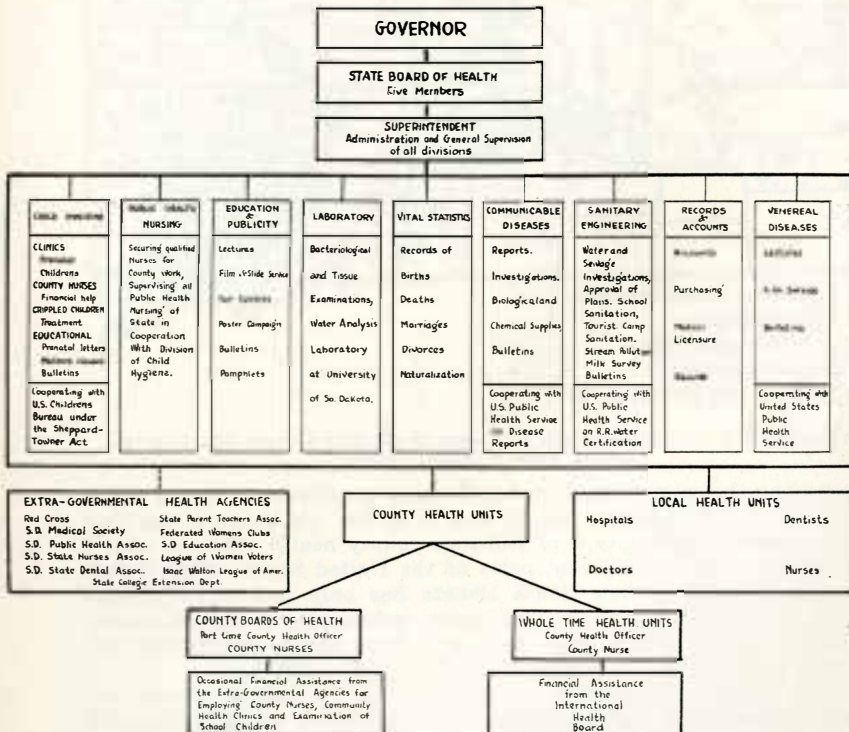


Figure 8—Showing the relationship of the State Board of Health to the other Health Agencies of South Dakota.

county, and local units is conducted by public health agencies. Figure 9 shows something of the type of work carried on by the board of health through its child hygiene division for the year 1926.

Much of the educational and some remedial health work, however, is conducted by voluntary extra-governmental health agencies, such as the Red Cross, public health associations, etc., as noted in the organization chart. (Figure 10) Practically all of the corrective medical work of a private nature is carried on by private practicing physicians.

Statewide Field Work of Child Hygiene Division State Board of Health (1926)

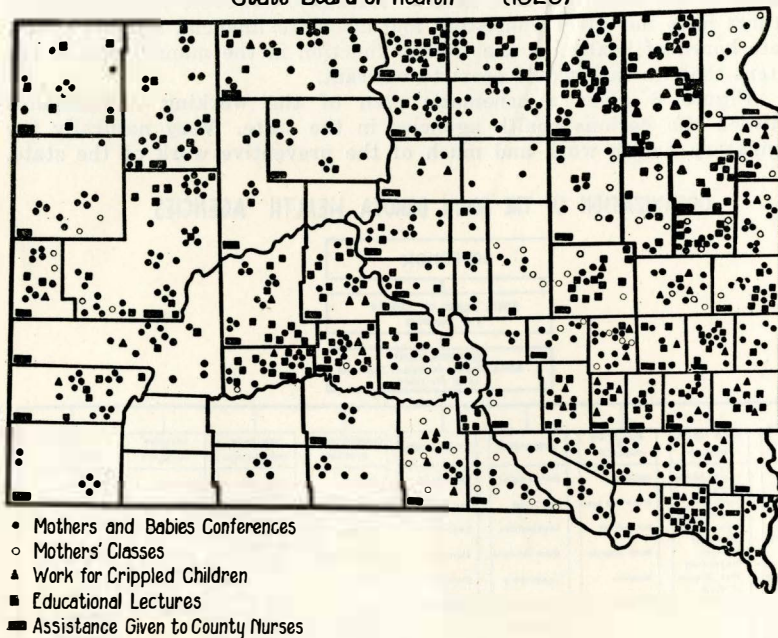


Figure 9—A part of the statewide field work of the child hygiene division of the State Board of Health. (1926)

Among the county health units, the usual practice is to have a single part-time county medical officer, and in a few instances, a full-time county nurse. Another type of full-time county health officer is slowly coming into vogue in different parts of the United States. (See Figure 11) At the present time South Dakota has only two such full-time county health officers, one in Pennington and another in Brown county. In such cases the county nurse is a part of the county health unit, and a public health office is maintained at the county court house.

One of the serious handicaps under which all health workers, especially those doing investigational work, have been struggling against in South Dakota for the past few years, has been a faulty birth and death registration system. By virtue of not conforming to the federal

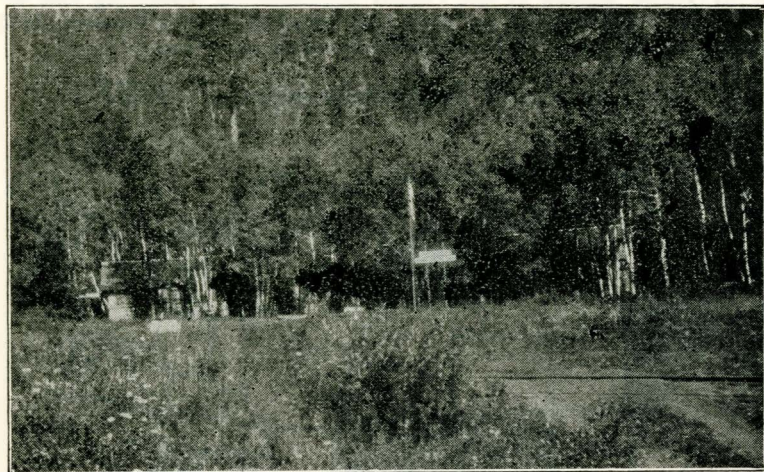


Figure 10—Camp Wanzer, a preventorium in the Black Hills, for undernourished children, sponsored by the South Dakota Public Health Association.

system of registering births and deaths, South Dakota has not been included in the Federal Birth and Death Registration area. (See Figure 12) Accordingly much South Dakota health data assembled up to the present time is not scientifically comparable to that of the other states. During the recent session of the legislature (1931), however, the South Dakota registration law for births was changed so as to conform to the

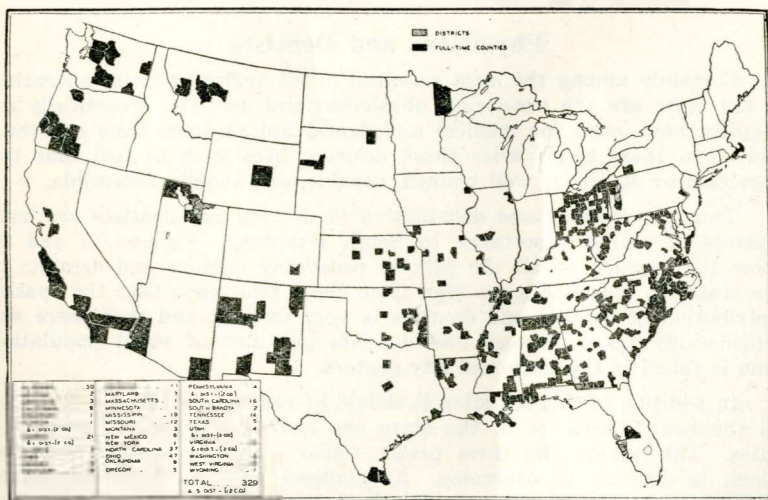


Figure 11—Full time county health units in the United States in 1926. (Courtesy of the division of Vital Statistics, Bureau of the Census)

United States Bureau of the Census requirements. Providing this law meets the additional 90 per cent test required by the bureau, South Dakota will from now on be in the birth registration area.

Birth and Death Registration Area: 1927

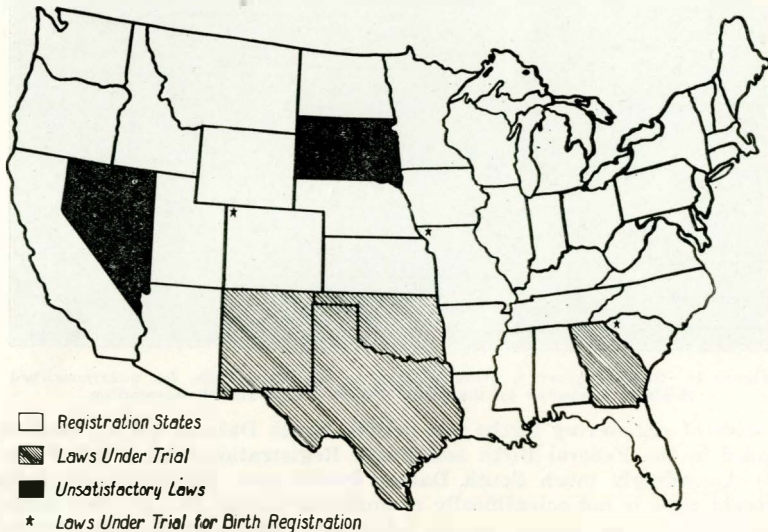


Figure 12—The birth and death registration area of the United States for 1927.
(Courtesy of the division of Vital Statistics, Bureau of the Census)

Physicians and Dentists

Certainly among the most essential of all health agencies operating in the state are the practicing physicians and dentists. Practically all families have need for medical and dental aid at some time or other, and when those needs arise those desiring help wish to feel that the physician or dentist is well trained, capable, and readily accessible.

Thus the number and distribution of doctors and dentists are both matters of prime importance to South Dakotans. Figures 13 and 14 show the location of all the private practicing doctors and dentists in the state. It can readily be seen from these two maps that the spatial distribution of doctors and dentists is very uneven, and that there are considerably fewer doctors and dentists per unit of rural population than is found in the town and city centers.

In addition to this situation it should be remembered that practically all the health agencies in the state are located in villages, towns, or cities. This places the farm people under a severe spatial handicap which is difficult to overcome. As evidence of this disadvantage, it must be remembered that the South Dakota Medical Association has for some years authorized its members to charge a standard mileage fee of \$1 per mile one way for all country calls, in addition to the customary

Practicing Physicians in South Dakota

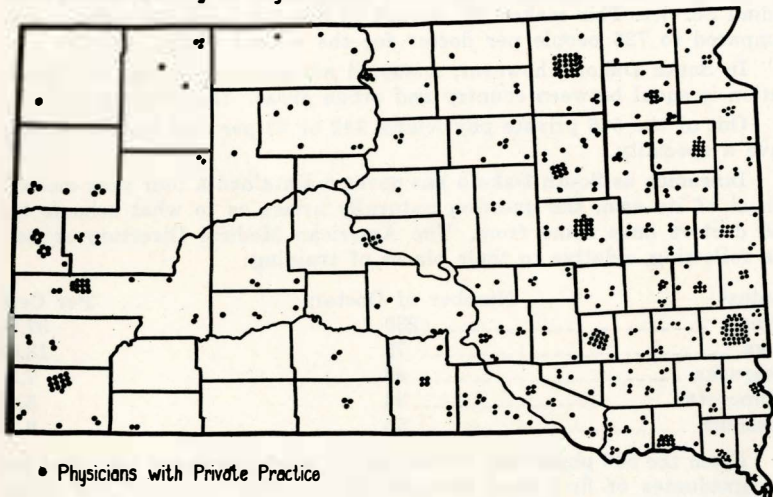


Figure 13—Practicing physicians in South Dakota for 1926.

Practicing Dentists in South Dakota

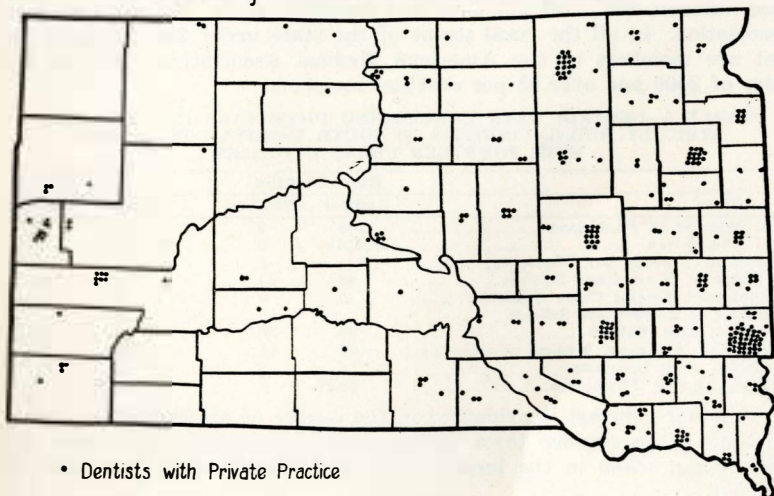


Figure 14—Practicing dentists in South Dakota for 1926.

\$3 medical fee. Even if the patient drives in to call at the doctor's office in town, there is the extra mileage cost both ways, which the townsman escapes because of his nearby residence.

There are a total of 604 regularly licensed physicians in South Dakota,¹ but only 566 are private practicing physicians. The remainder

¹ American Medical Association Directory, 1927.

of 38 are either connected with state institutions or in the government Indian Service. This makes an average of one physician per 1,095 people compared to 726 people per doctor for the United States. (1921)¹

In South Dakota, however, it should not be inferred that the distribution is equal between country and urban areas. (See Figure 13)

Out of the 566 private physicians, 142 or 23 per cent state that they have a specialty.

Inasmuch as South Dakota has never maintained a four year medical school of its own, the question naturally arises as to what schools the 566 doctors have come from. The American Medical Directory reveals the following, relative to their places of training:

States ²	Number of Doctors	Per Cent
Illinois -----	230	37.95
Iowa -----	79	13.03
Nebraska -----	46	7.59
Minnesota -----	34	5.61
Missouri -----	56	9.24

From the 566 physicians in the state it is interesting to note that 386 are graduates of first class medical schools. The remainder are either graduates of second class or third class schools, or from schools that are now extinct or that have been consolidated with other schools. The average age of all the 566 physicians in the state is 50.09 years. Of the total number, 226 or 37 per cent, are members of the American Medical Association. In all the rural towns of the state under 2500, only 27 per cent are members of the American Medical Association, while in the cities of 2500 and over 55 per cent are members.

TABLE 6--CERTAIN DATA CONCERNING PHYSICIANS IN FOURTEEN STRICTLY RURAL COUNTIES IN SOUTH DAKOTA CONTRASTED WITH FOURTEEN URBAN COUNTIES

Items	Rural Counties		Urban Counties	
	Number	Per Cent	Number	Per Cent
Total Number of Physicians-----	108	0	284	0
Total Population -----	145,216	0	230,798	0
Number of Persons per Physician-----	1,344	0	841	0
Graduates of First Class Schools-----	68	63.	154	54.
Graduates of Second Class Schools-----	0	0	1	.035
Graduates of Third Class Schools or Schools now Extinct-----	39	36.	95	33.
Members of American Medical Association--	25	24.	129	45.
Physicians with Specialty-----	10	9.	96	34.
Average Age of Physicians-----	50.26	0	49.23	0

Another contrast is evidenced in the degree of specialization. There are among the smaller town doctors only about 13 per cent who are specializing, while in the larger cities of 2500 and over, there are 42 per cent.

Further inequalities in point of health service rendered to 14 strictly rural counties¹ in contrast to 14 larger urban counties are shown in Table 6. It is noteworthy that in every item of comparison, the urban centers have the advantage.

1 "Some Rural Social Agencies in Ohio," Bulletin Number 4. Ohio Extension Service, P. 21, C. E. Lively, 1922.

2 Other important states were represented in the order named: Michigan. Ohio, Indiana, New York, and Kentucky.

Hospitals

South Dakota has 58 general hospitals serving the public.² (1926). (See Figure 15). Of this number 38 are privately owned and operated, 18 by churches, and one is a tax supported county hospital.

The location and distribution of these hospitals is noteworthy. Some 31 out of 58 are in cities of 2500, while only two small hospitals are in towns of less than 250. (See Table 7).

TABLE 7—NUMBER OF HOSPITALS AND HOSPITAL BEDS IN SOUTH DAKOTA ACCORDING TO LOCATION AND AUSPICES

Location in Towns According to Size		Privately Owned		Under Church Auspices		Tax Supported	
		Number of Hospitals	Average No. Beds	Number of Hospitals	Average No. Beds	Number of Hospitals	Average No. Beds
2501 or more	17	54		14	57		
251-2500	19	32		4	49	1	16
250 or less	2	20					

There are 38 counties out of 66 in South Dakota without hospital service at all. These counties contain 37.8 per cent of the state's population. Most of the territory between the Black Hills and the Missouri river is entirely without hospital service. (See Figure 15).

Public Hospital Service in South Dakota

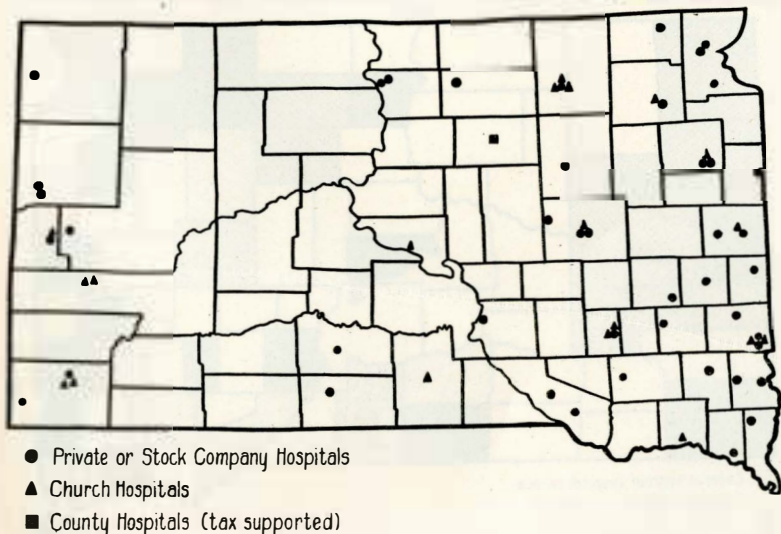


Figure 15—Public hospital service in South Dakota for 1926.

1 The rural counties referred to are Grant, Day, Clark, Moody, McCook, Hutchinson, Union, Charles Mix, Gregory, Hand, Faulk, Stanley, Corson, and Meade. The fourteen urban counties are Codington, Brookings, Lake, Minnehaha, Clay, Yankton, Davison, Beadle, Spink, Brown, Walworth, Hughes, Pennington, and Lawrence. A so-called urban county in South Dakota is one with a town of over 2500 as its center. Most of these centers are county seat towns.

2 In addition to the above there are 12 federal and state institutional hospitals of one kind or another with a total of 2,403 beds. These of course are not open to the general public.

The unit of hospital service, however, must be primarily the hospital bed. Figure 16 shows the hospital service in the various counties measured in terms of hospital beds. (1926).

The American Hospital Association maintains that adequate hospitalization demands one hospital bed for every 250 of the population. On this basis, South Dakota is woefully under-hospitalized, as only 15 counties can qualify. (See Figure 16). Considering the state as a whole there are only 2,698 hospital beds to serve a public of 620,163, not otherwise reached by hospitalization. This means an average of one bed to 2,290 people, or about one ninth enough to be adequate.

Something should be said concerning the effectiveness of the one tax-supported hospital in the state, located at Faulkton, in Faulk county. (Figure 17).

The writer spent some time there three years ago, going over the health situation with both local health workers and citizen tax payers of that county. As far as could be ascertained, the Faulk county people in the main were enthusiastic over the project and felt that the county hospital plan offered the most practical solution for hospitalization in a rural county. It is patronized freely by both town and country people, the latter constituting 70 per cent of the patronage.

Hospital service measured in terms of hospital beds per population, by counties.
1926

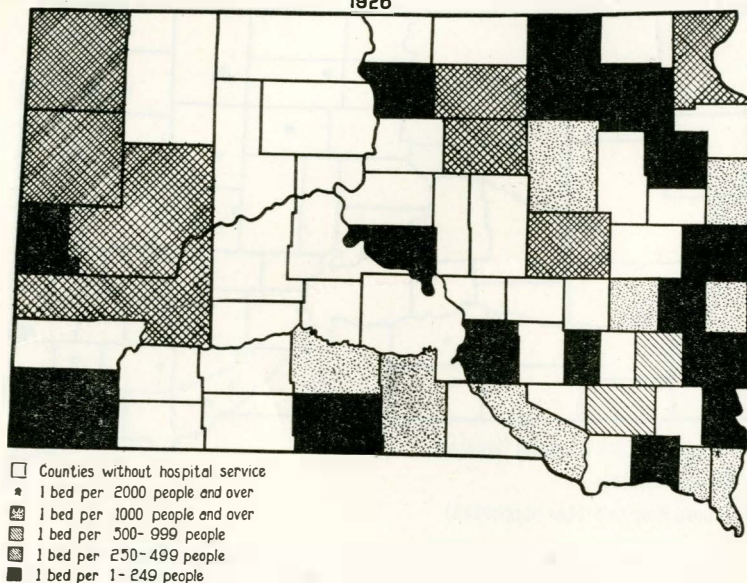


Figure 16—Hospital service, 1926, measured in terms of hospital beds per population in counties of South Dakota.

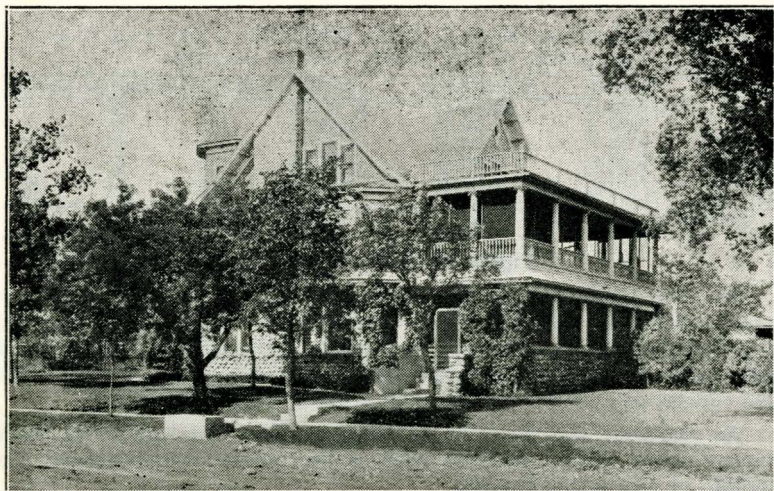


Figure 17—Faulk county hospital—the only county hospital in South Dakota.

The hospital was first started in 1915 as a community hospital corporation. An unusually spacious and well-built three story private residence was purchased for \$15,000, and remodeled for hospital purposes. The corporation operated for four years but in 1919, owing to financial embarrassment, asked the county to take over the project as a county hospital and assume the remaining indebtedness of \$7,500.¹ This was done, giving the county a well-equipped property in good repair, valued at \$30,000. Since then much other equipment has been added so that the establishment now is worth approximately \$50,000.

The hospital is managed by a county board of control, one member of which must be a physician. No paid hospital interne or resident county physician is maintained on the staff, but any reputable physician in the county may treat his patients there. A nursing staff is maintained, consisting of a matron, one day nurse, and a night nurse, and such other graduate nurses as may be needed.

The hospital as present has 16 hospital beds in eight rooms.

Under county ownership the deficits are met out of tax levies. At present the annual levy is about \$3,500, which amounts to about 50 cents per capita. It is hoped to eventually make the hospital self-sustaining.

Table 8 is a brief statistical summary of certain phases of the work of the Faulk county hospital for the period of six years from 1921-1926, inclusive.²

¹ This was the same year in which the legislature passed a county hospital law, enabling a county to authorize a bond issue for owning and operating a hospital.

² Furnished by the secretary of the Faulk county hospital. He states that expenditures during 1923 and 1924 were large owing to the fact that a new heating equipment was installed, elevator and operating room and equipment were added. Later in 1924 a modern sterilizer was installed.

TABLE 8—CERTAIN STATISTICAL DATA COVERING A SIX YEAR PERIOD
RELATIVE TO THE FAULK COUNTY HOSPITAL

Year	Receipts	Expenditures	Deficits*	Total Patients	Medical	Surgical
1921	\$10,656.97	\$11,174.00	\$ 517.03	169	82	70
1922	7,671.84	11,635.64	3,963.80	218	108	90
1923	9,720.97	15,696.73	5,975.76	242	89	113
1924	11,543.05	14,908.31	3,365.26	278	88	156
1925	10,923.66	13,501.58	2,577.92	286	97	145
1926	11,845.22	13,535.98	1 690.76	296	104	144

*Paid out of county taxes.

Public Health Nursing

The first public health nursing services in South Dakota were furnished entirely by volunteer health agencies, such as the Red Cross and the South Dakota Public Health Association. The purpose of furnishing these services was to demonstrate the value and practicability of a full time county, city, or school nurse, as a public health agency.

As expected, the financing of these services was gradually taken over by public official agencies such as the county commissioners, city councils, or city school boards.

In 1920 the State Board of Health employed a state supervisor of public health nursing, aided by the Red Cross and the South Dakota Public Health Association. After the passage of the federal law, called the Shepherd-Towner act and its acceptance by the state of South Dakota, this supervising of public health nursing was financed entirely by the state.

In 1926 there were 25 public health nurses employed in the state. (See Figure 18). Nine of this number were county nurses, four were city nurses, seven were city school nurses, and the remainder worked in a statewide capacity, mainly through state voluntary health organizations, and the State Board of Health.

Public health nursing includes in its scope a wide range of activities. Under South Dakota conditions perhaps the best known is school nursing, together with tuberculosis prevention, pre-natal and infant hygiene work, emergency bedside nursing, and general health education.

Unfortunately since the beginning of the agricultural depression in 1922 and up to the present time, this type of public health work has been very much at a standstill.

In addition to the public health nurses, there are of course many more private registered nurses practicing in the state. In this connection, however, it is interesting to see how in recent years the care of the sick is gradually being turned over to the hospitals rather than to employ a private nurse to look after the patient in the home.

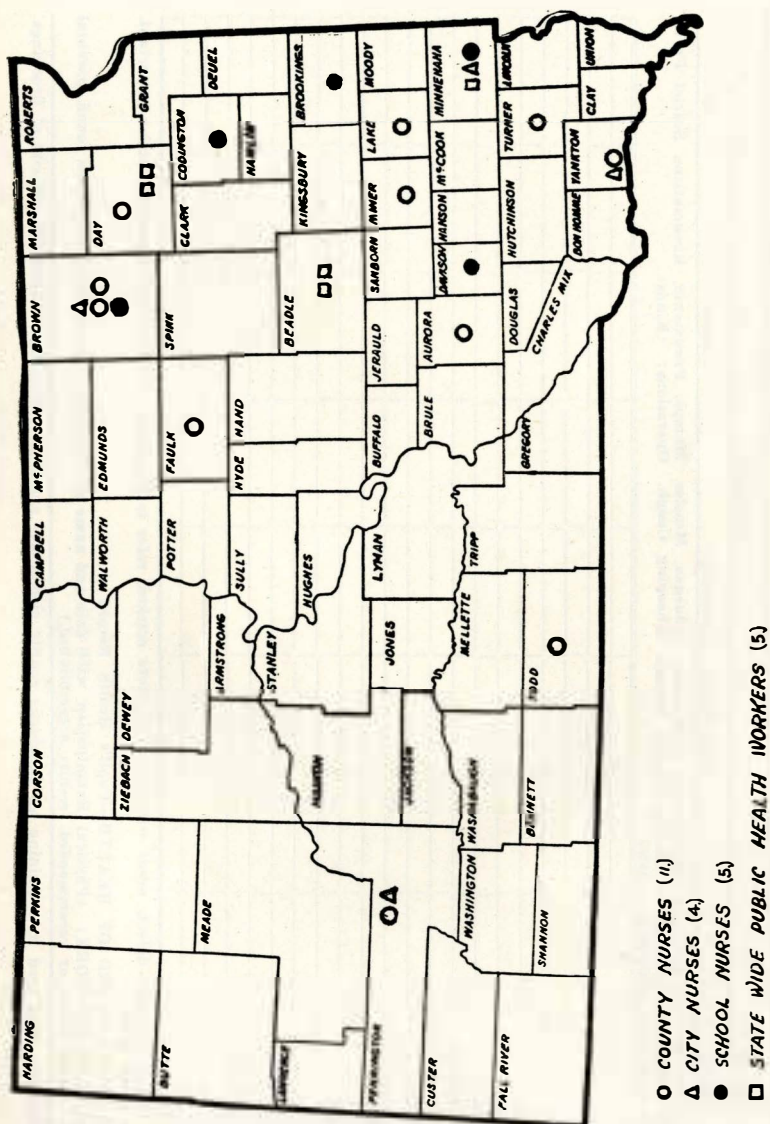


Figure 18—Public health nurses in South Dakota for 1926.

Name or No. of School			
Name in full (Surname first)	Sex	Birthplace	Date of Birth
Name of Parent or Guardian	City, Village, Township	County	State
HISTORY OF: (underline) Appendicitis, Chicken-pox, Diphtheria, Influenza, Measles, Mumps, Pneumonia, Rheumatism, Scarlet Fever, Smallpox, Tonsillitis, Typhoid, Tuberculosis, (lungs, glands, bones), Whooping Cough. Operations: (Kinds) Successful vaccination against Smallpox: (date)			
Date of Inspection			
Grade			
Height in Inches			
Weight			
Actual			
Normal			
Defects of: Vision			
Eyes			
Ears			
Teeth			
Nose			
Throat			
Skin			
Glands			
Bones			
Nutrition			
Posture			
Symptoms of Diseases of:			
Lungs			
Heart			
Nerves			

KEY: C-no defect found. V-slight defect, needs watching. VV-more marked, refer to Physician. VVV-serious, immediate action important. C-correction (with date).

SOUTH DAKOTA STATE BOARD OF HEALTH—Pupil's Health Record

RECORD OF FOLLOW-UP WORK: (Physical Examination with date and name of Physician, date of visits, conditions found, parental co-operation action taken or recommended, results accomplished.)

Front side of questionnaire card used in examining all Brookings county elementary and high school pupils, except in the city of Brookings.

PART III

HEALTH CONDITIONS IN BROOKINGS COUNTY

In order to make a more intensive study of existing health conditions in the state, at this point all efforts were focused on one county. Brookings county was selected as it seemed to be as typical as any county for the eastern part of the state, and as it was more readily accessible to the writer than any other.

The reader is referred to pages 8 to 12, under the section entitled, "Description of Area and People," to review again the physical, historical, economic, and social factors which have influenced health conditions in Brookings county.

This part of the bulletin will deal largely with the findings obtained in the two surveys referred to on pages 4 to 7, under the section on "Method of Study." Attention is called to the fact that the four townships were selected as furnishing a good cross section of Brookings county. The two small towns of Sinai and Bruce are thought to be typical of the village type of town in the country.

Sources and Routes of Infectious Disease¹

Formerly public health experts thought that the sources of infectious diseases as well as non-infectious diseases were to be sought mainly in the surroundings of mankind, especially "In the foul, ill-smelling, unventilated, and sunless places." Accordingly, remedial and preventive measures sought to make man's surroundings conform to so called "sanitary laws of health." This method, as desirable as it might seem, was only partially successful because of the enormity of the task and because it seldom got at the heart of the problem.

Thanks to later findings in bacteriology, epidemiology, and vital statistics, the emphasis in the new public health, as far as infectious diseases are concerned, has now been shifted from environment to that of the infected individual. The modern public health officer first looks for "the source of infectious diseases in the infected individual or animal whose excretia, or other constituents or body contents may enter the bodies of other individuals." In short "the ultimate goal of modern public health is to locate all infected individuals and to guard all their body discharges." Because of the present difficulty in knowing who these infected persons are, every effort is made to guard the routes which unlocated infections may take.

Briefly epidemiologists now accept tentatively the following formulations concerning the sources and routes of infectious diseases:

"Due to the transmissibility of germs from body to body, it is believed that germs leave the body in the form of discharges, principally from the nose, throat, bladder, bowels, or other orifices of the body.

"The discharges infect another person practically only when that person takes the discharges in some form in the mouth or nose except in trachoma and venereal diseases.

"Outside the body, disease germs do not multiply in nature except rarely and very temporarily in milk, water, or other similar fluids."

¹ For the ideas expressed in this section on "Sources and Routes of Infectious Diseases" the writer has drawn freely from the book by H. W. Hill, entitled "The New Public Health."

TABLE 9—WATER SUPPLY CONDITIONS IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY—1929

Cistern		Well				Drainage				Platform			Distance from Poulton	
		Drilled	Dug	Bored	Sand Point	Good	Fair	Poor		Wood	Cement	Gravel	25 ft. or less	Above 25 ft.
No.	Pct.	No. Pct.	No. Pct.	No. Pct.	No. Pct.	No. Pct.	No. Pct.	No. Pct.		No. Pct.	No. Pct.	No. Pct.	No. Pct.	No. Pct.
Oslo.....	0 0	45 47	41 43	9 9	0 0	60 73	19 23	3 3		74 85	11 12	2 2	23 27	62 72
Oakwood.....	2 6	3 10	9 31	7 24	8 27	14 70	2 10	4 20		6 42	8 57	0 0	4 57	3 42
Parnell.....	0 0	32 43	23 31	19 25	0 0	65 85	10 13	1 1		69 93	3 4	2 2	17 24	52 75
Argo.....	0 0	28 38	27 37	17 23	0 0	54 75	16 22	2 2		51 69	22 30	0 0	20 29	47 70
Bruce.....	0 0	3 3	4 5	0 0	70 90	9 81	2 18	0 0		12 35	18 52	4 11		
Sinai.....	46 100	0 0	0 0	0 0	0 0	24 88	3 11	0 0		3 7	36 92	0 0		

TABLE 13—NUMBER AND PERCENTAGE OF FARM HOMES WITH MODERN CONVENIENCES IN FOUR BROOKINGS COUNTY TOWNSHIPS

Conveniences	Argo				Oakwood				Oslo				Parnell			
	No. of all homes with	Per cent	No. owners homes with	No. tenants homes with	No. of all homes with	Per cent	No. owners homes with	No. tenants homes with	No. of all homes with	Per cent	No. owners homes with	No. tenants homes with	No. of all homes with	Per cent	No. owners homes with	No. tenants homes with
Av. No. Rooms.....	5.7		6.5	6.7	6.6		7.0	5.9	6.5		6.8	6.1	7.1		7.0	7.3
Electric Lights.....	8	12.1	5	3	6	8.8	4	2	13	13.9	12	1	11	18	6	5
Furnace Heat.....	8	12.1	7	1	7	10.3	4	3	9	9.6	9	0	8	13.1	4	4
Running Water.....	1	1.5	1	0	9	13.2	7	2	6	6.4	5	1	9	14.7	6	3
Telephone.....	57	86.4	27	30	19	27.9	13	6	59	63.4	35	24	21	34.4	12	9
Power Driven Washer.....	57	86.4	27	30	31	45.6	20	11	67	72	38	29	48	78.7	20	28
Oil Stove.....	38	57.6	18	20	29	42.6	16	13	61	65.5	36	25	23	37.7	19	14
Vacuum Cleaner.....	1	1.5	0	1	2	2.9	1	1	0	0	0	0	4	6.5	4	0
Radio.....	50	75.79	26	24	31	45.6	18	13	51	54.8	32	19	39	63.9	16	21
Phonograph.....	16	24.2	8	8	8	11.8	4	4	37	39.7	24	13	21	34.4	10	11
Piano.....	18	27.2	11	7	16	23.5	11	5	22	23.6	16	6	17	27.9	10	7
Organ.....	12	18.1	8	4	8	11.8	5	3	8	8.6	3	5	1	1.6	0	1
Kitchen Sink.....	43	65.1	24	19	41	60.3	21	20	37	39.7	24	13	32	52.5	15	17
Sewing Machine.....	62	93.9	30	32	50	73.5	28	22	70	75.2	39	31	51	83.6	21	30
Refrigerator.....	6	9.1	3	3	8	4.4	3	0	0	0	0	0	2	3.3	0	2
Bathroom.....	2	3	2	0	7	10.3	4	3	9	9.6	8	1	5	8.2	2	3

The main routes of infectious diseases arise from:

Nose and mouth through spray or sputum. This may be spread by direct contact, or by kissing, and by the hands.

Bowels and bladder discharges spread chiefly by the hands.

Flies, carrying germs from feces to food.

Food, such as milk and other foods carried by flies, hands, etc.

Water, often contaminated by sewage.

Farm Sanitation

With the above principles of sanitation in mind, the first step in the survey was to examine the conditions surrounding rural and village homes, especially those surroundings which might be possible routes for the spread of infectious diseases.

Table 9 contains the findings relative to the water supply of the four townships and two small towns of Sinai and Bruce. It is evident that the majority of farm homes in Brookings county maintain a fairly satisfactory water supply. In the majority of instances the wells are protected by a wooden platform, and have fairly good drainage. Sinai is apparently dependent on cistern water, while the Bruce water supply comes from wells fed through sandpoints. The other wells in the county are either dug, drilled, or bored.

Table 10 shows the situation relative to the milk supply. Most of the milk is produced from herds on the farms of the families surveyed, and is apparently of at least average grade. About 15 per cent of the herds producing milk used in the farm homes, have been tuberculin tested, and 60 per cent of those supplying milk to the villages. The city of Brookings has a city ordinance requiring all milk sold within its limits to come from tuberculin tested herds.

TABLE 10—SOURCES OF MILK SUPPLY IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY

	Purchased		Private		Tuberculin Tested			
	No.	%	No.	%	Yes		No	
	No.	%	No.	%	No.	%	No.	%
Oslo -----	4	4.8	80	95.2	16	20.3	63	79.7
Oakwood -----	0	0	58	100.	6	10.7	50	89.3
Parnell -----	1	1.3	77	98.7	17	23.9	54	76.1
Argo -----	0	0	73	100.	6	8.6	64	91.4
Bruce Village --	43	69.4	19	30.6	42	82.4	9	17.6
Sinai Village --	31	86.1	5	13.9	8	44.4	10	55.6

The manner of excreta disposal is tabulated in table 11. It is evident that the "privy" is the common method used in the four townships. The two villages have attempted to solve the problem in individual homes by some form of indoor toilet, but as yet have no village sewage system.

The common method of garbage disposal on the farms is to feed the garbage to either the hogs or fowls. (Table 12). Due to cool or temperate climatic conditions for most of the year, this is not as serious a problem as it is farther south. In the villages no garbage collection system has been developed, but each family disposes of its own, mostly by burning.

TABLE 11—KIND, NUMBER, AND PERCENTAGE OF EXCRETIA DISPOSAL SYSTEMS IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY—1929

	Sewage		Cesspool		Tank		Outlet		Privy	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Oslo -----	4	4.6	0	0	1	1.2	0	0	81	94.2
Oakwood ----	0	0	1	1.6	1	1.6	0	0	60	96.3
Parnell -----	0	0	0	0	0	0	0	0	53	100
Argo -----	0	0	1	1.5	0	0	0	0	67	98.5
Bruce Village 0	0	0	10	27	10	13.5	1	1.4	43	58.1
Sinai Village 21	23.1		1	1.1	15	16.4	27	29.7	27	29.7

Considering the problem of farm sanitation as a whole, it is probably fair to say that conditions in Brookings county are at least average. Farmers in this section of the country are fortunate in having plenty of sunshine, and a fairly cool, dry climate. In its incidence of both communicable and non-communicable diseases it has a better record for the past six years than the average of the twenty counties with the best health facilities in South Dakota.

TABLE 12—METHODS OF GARBAGE DISPOSAL IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY

	Collected		Burned		Buried		Left on Ground		Fowls		Fed to Hogs	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Oslo -----	0	0	1	.9	0	0	0	0	28	24.8	84	74.3
Oakwood ----	0	0	1	1.	0	0	0	0	47	49.5	47	49.5
Parnell -----	0	0	1	1.1	0	0	0	0	44	50.	43	48.9
Argo -----	0	0	0	0	0	0	1	.9	55	48.7	57	50.4
Bruce Village .2	2.7		21	28.	1	1.3	9	12.	25	38.7	13	17.3
Sinai Village .4	7.7		16	30.7	5	9.6	0	0	26	50.	1	1.9

Home Conveniences

The movement for the modernization of farm homes in the county was progressing rather rapidly until 1922 when the agricultural depression became general throughout the country. Many farmers in the survey stated that plans had been made in their homes to install running water, electric lights, furnace heat, etc., but the drastic curtailment of their income due to falling prices had necessitated an equally drastic cut in their family standard of living. Naturally one of the first places for this retrenchment to take place was in the matter of home conveniences.

It is noteworthy, however, to see the large percentage of farm homes having telephones, power-driven washing machines, oil stoves, kitchen sinks, radios, and sewing machines. (Table 13). From a health standpoint, these conveniences have done much to free farm women from much of their former drudgery, and to increase to some extent the amount of their leisure time. As an offset to this gain, however, attention is called to the decreasing amount of help hired on farms, as shown in table 3. While much of the farm work formerly done by hired help is now being done by machinery, it is also true that various members of the family including the women are now helping more with the outside work, especially that work which is of a seasonal nature.

The large modal average number of rooms found in the homes of both owners and tenants (Table 14) seems to be consistent with the large rural families found in the county. The large families, in turn, can be satisfactorily explained on the basis of custom among certain nationality strains.

It is evident from Table 15 that the major emphasis has been centered on utility and comfort, rather than ornamentation and beauty in the surroundings of the farm homes in the county. The maintenance of shade trees and a garden has in most cases taken precedence over a fenced yard, lawn, shrubs, and flowers.

Food Habits of the Farm Family

There seems to be no doubt but that a definite and vital relationship exists between food habits and the health of the family. There are certain food needs that must be met to maintain good health. These food needs vary somewhat with individuals according to their age, activity, etc., but in the main all members of the family require a regular and well-balanced diet. Such a diet calls for a sufficient amount of food, as well as foods that contain every material needed by the body.

Nutrition specialists seem to be agreed that there are certain important food needs.

Growth and repair foods

Proteins, furnish the main basis for growth and repair of the living tissues. They are supplied in such foods as eggs, milk, cheese, lean meat, legumes, etc., and to some extent in other foods such as bread and potatoes.

Calcium or **lime**, and **phosphorus**, form the principal constituents for growth of bones and teeth. Some of the best foods supplying calcium are milk and leafy vegetables. Phosphorus is supplied through milk, meat, whole cereals, egg yolk, and fruits.

Iron, is another important building food, especially for the blood. It is supplied in such foods as leafy vegetables, whole cereals, and fruits. (Certain other minerals are needed in small amounts, but if the homemaker uses the above named foods, these will probably be taken care of.

Heat and energy foods

Carbohydrates (sugars and starches) and **fats**, are the best fuel foods.

Vitamins are of five different types. They are known as vitamins A, B, C, D, E.

A—Is supplied mainly through milk, butter, cream, egg yolk, leafy vegetables, and glandular organs, such as liver, kidneys, and sweet breads.

B—Is found in nearly all the common food stuffs. It is seldom found in oils, starch, sugar, syrups, and only in inadequate amounts in highly refined flours and polished rice.

C—Is found in fresh fruits, especially citrus fruits and fresh vegetables such as cabbage, turnips, potatoes, tomatoes. It is easily destroyed by heat.

D—Is found in egg yolk, leaves of plants, cod liver oil and to some extent in butter fat.

E—It quite widely distributed in most of the common foods.

¹ Materials for this section have been borrowed freely from a publication called "Food Needs for Health," by Mary A. Dolve, Extension Circular 275, South Dakota State College, 1928. For other valuable suggestions the writer is heavily indebted to Dean Edith Pierson and Susan Z. Wilder, extension nutritionist of the home economics staff at South Dakota State College.

Foods regulating processes and growth

TABLE 16
THE PERCENTAGE OF FAMILY MEMBERS IN FOUR TOWNSHIPS WHO REGULARLY EAT CERTAIN FOODS CONSIDERED ESSENTIAL TO GOOD HEALTH.

	Lettuce		Raw Cabbage		Tomatoes raw, cooked		Celery		Cooked Vegetables		Greens		Milk		Cereals Cooked	
	Ad.(1)	Ch.(2)	Ad.	Ch.	Ad.	Ch.	Ad.	Ch.	Ad.	Ch.	Ad.	Ch.	Ad.	Ch.	Ad.	Ch.
Oslo -----	58	64	76	70	84	80	43	42	86	90	52	49	75	80	84	86
Oakwood ----	80	67	86	69	87	71	48	46	87	76	53	57	77	74	86	75
Argo -----	72	90	90	55	92	56	57	88	66	73	75	42	76	43	56	73
Parnell ----	71	68	90	69	93	82	73	52	98	83	74	60	62	65	95	81
AVERAGE 70		72	86	66	89	72	55	57	85	80	64	52	72	66	80	79
Sinai -----	47	28	75	51	84	47	37	13	82	56	40	10	82	56	83	53
Bruce -----	72	69	86	73	83	73	58	65	86	78	60	33	78	80	78	72
AVERAGE 59		49	80	62	83	60	47	39	84	67	50	21	80	68	80	63
(1) Adult (2) Children																

TABLE 17
THE AMOUNT OF CERTAIN FOODS SERVED DAILY OR BY FAMILIES IN FOUR BROOKINGS COUNTY TOWNSHIPS AND TWO SMALL TOWNS

	DAILY			WEEKLY		
	Qts. Milk	Pts. Cream	Pts. Cot. Cheese	Lbs. Other Cheese	Lbs. Sugar	Lbs. Butter
Oslo -----	3.2 qts.	1.1 pt.	.08 pt.	.03 lb.	5.2	3.5
Oakwood ----	2.8 qts.	.09 pt.			8	3.5
Argo -----	2.1 qts.	.08 pt.	.009 pt.	.01 lb.	6.5	3.5
Parnell ----	2 qts.	.06 pt.	.02 pt.	.04 lb.	6.	3.4
AVERAGE 2.5 qts.		.33 pt.	.036 pt.	.03 lb.	6.4	3.5
Sinai -----	1.7 qts.	.03 pt.	.003 pt.	.01 lb.	4.2	2.5
Bruce -----	1.9 qts.	.02 pt.	.01 pt.	.02 lb.	4.8	2.8
AVERAGE 1.8 qts.		.03 pt.	.006 pt.	.015 lb.	4.5	2.6

Roughage is supplied through vegetables, fruits and whole cereals. Meals served regularly, the use of plenty of water, and regular visits to the toilet, are important factors in adequate elimination of body wastes.

If these principles of body food needs for health are stated in quantitative terms, a day's balanced diet for the family should include the following food groups and in the approximate amounts given:

- 1 quart of milk for every child.
- 1 pint of milk for every adult.
- 1 serving of vegetables besides potatoes.
- 1 serving of fruit.
- 1 serving of raw vegetables or fruit.
- 1 serving at least of meat, egg, fish, or cheese.
- 1 serving of whole cereal as breakfast food or bread.
- 6 to 8 glasses of water.

Assuming this brief and general statment of a well-balanced diet to be approximately correct, the writer has applied it as a measuring stick to the food habits of farm families in Brookings county.

Tables 16, 17, 18 and 19 show the survey findings in relation to food habits in four townships and two small towns.

In order to interpret these findings the reader is referred first to Tables 20 and 21 dealing with the size of families and distribution of age groups in these areas, and especially to the column in Table 20 showing the total average number of people at home among the various families.

Applying the standards as set forth above for the daily diet, the following conclusions may be drawn concerning the uses made of various food groups:

Milk—Considering the great importance of milk as a food, the showing of 2.5 quarts per day for country families and 1.8 quarts per day for town families is fair, for both adults and children using milk regularly; the chief shortcoming is that far too large a percentage in both country and town are not using milk regularly in the diet.

Vegetables—The showing in this food group was quite good. Besides potatoes, some vegetables, cooked or raw, were served 7.49 times per week for country families and 9.58 for town families.

Fruits—The use made of this food group cooked or raw. averages 1.2 times per day for both town and country families, and during winter and summer this compares favorably with the standard.

Raw vegetables or fruits—The findings indicate that the uses made of this group were similar to the fruit group. These were served 1.15 times per day in the country and 1.1 times in town.

Proteins—The use made of this group was above the standard suggested. It was served 1.56 times daily in the country, and 1.45 times in town. The shortcoming, if any, in protein foods was on the basis of selection. Many excellent protein foods such as cheese, fish, eggs, etc., were used only in very small quantities. These dishes, if used more freely, would give variety to the protein group.

Whole cereals—Cereals are used on an average of 1.4 times a day. A high percentage of cooked cereals (mostly oatmeal) is used almost once a day. Dark bread was used more often in town than country.

The percentage of children receiving a hot school lunch was very low in the country. (Table 19). If the hot lunch had been served to all

TABLE 18
THE NUMBER OF TIMES CERTAIN FOODS ARE SERVED WEEKLY IN FAMILIES OF FOUR BROOKINGS COUNTY TOWNSHIPS
AND TWO SMALL TOWNS

Vegetables (not potatoes)							Tomatoes		Fruits				
Cooked		Leafy		Raw			All Kinds		Raw		Cooked		
W.(1)	S.(2)	W.	S.	W.	S.		W.	S.	W.	S.	W.	S.	
Oslo	4.3	4.3		.08	.03	.02	.05	1.3	3.6	5.6	3.7	4.1	3.9
Oakwood	6.3	6.3						2.1	2.1	5.	5.1		
Argo	5.1	5.9	1.2	1.1	1.	1.3		1.2	3.4	5.	4.3	4.9	3.5
Parnell	5.3	5.8	.08	1.4	1.	1.8		.09	2.4	4.2	4.	4.2	3.6
AVERAGE	5.2	5.6	.45	.84	.67	1.05		1.17	2.9	4.9	4.3	4.4	3.7
Sinai								1.8	4.	4.9	3.1	4.1	4.
Bruce	3.1	3.7	1.3	1.4	1.4	2.		1.4	4.	5.	3.5	2.9	3.8
AVERAGE								1.6	4.	4.9	3.3	3.5	3.8

Bread										Cereals				
					Dark			Cooked		Prepared		Hot	Breads	
					S.	W.	S.	W.	S.	W.	S.	W.	S.	
Oslo	.04	.04	.02	.04	5.3	5.5	4.3	3.6	2.9	2.4	5.6	.08	.06	5.8 .09 .03
Oakwood	.06	.05	.03	.03	6.	6.1	5.5	5.4	1.4	1.4	6.4	.07	.01	5.8 2.4 2.
Argo	.06	.09	.01	.02	6.	6.	4.8	4.9	1.7	1.8	6.3	1.2	1.4	5.6 .06 .02
Parnell	.06	.08	.03	.05	6.7	6.5	4.9	5.4	2.2	2.2	6.	1.6	1.4	5.5 1. .07
AVERAGE	.06	.07	.02	.04	6.	6.	4.9	4.8	2.	1.9	6.1	.74	.72	5.7 .89 .53
Sinai	.02	.01	.01		6.1	5.8	4.8	2.8	2.9	2.7	5.5	.03	.04	5.5 .06 .02
Bruce	.02	.02	.01	.02	6.	5.7	4.7	4.3	2.4	2.5	6.	1.8	1.1	5.2 1. .04
AVERAGE	.02	.02	.01	.02	6.	5.8	4.8	3.6	2.7	2.6	5.8	.92	.57	5.4 .53 .03

(1) Winter (2) Summer

TABLE 19

GENERAL FOOD HABITS OF CHILDREN IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY

Percentage of Children Who Are:

	Getting Hot School Lunch		Fussy About Their Food		Eating Vegetables		Drinking Milk	
	Yes	No.	Yes	No	Yes	No	Yes	No
Oslo -----	.38	.62	.22	.78	.93	.07	.91	.09
Oakwood -----	.38	.62	.22	.78	.82	.18	.75	.25
Argo -----	.39	.61	.31	.69	.97	.03	.71	.29
Parnell -----	.28	.72	.20	.80	.97	.03	.84	.16
AVERAGE -----	.36	.64	.24	.76	.92	.08	.80	.20
Sinai -----	.89	.11	.36	.64	.69	.31	.80	.20
Bruce -----	.97	.03	.31	.69	.96	.04	.89	.11
AVERAGE -----	.93	.07	.34	.66	.82	.18	.85	.15

TABLE 20

THE SIZE OF FAMILIES AND NUMBER OF MEMBERS REMAINING AT HOME IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY

	Total Number At Home	Number Boys In Family	Total Number Members In Family	Number Girls In Family
Oslo -----	4.8	4.6	1.6	1.3
Oakwood -----	5.0	4.2	1.7	1.4
Argo -----	4.8	4.7	1.5	1.4
Parnell -----	5.2	4.7	1.8	1.5
AVERAGE -----	5.0	4.6	1.7	1.4
Sinai -----	3.8	3.6	1.1	.9
Bruce -----	4.2	3.9	1.0	1.3
AVERAGE -----	4.0	3.8	1.1	1.1

TABLE 21

POPULATION OF FOUR TOWNSHIPS AND TWO TOWNS IN BROOKINGS COUNTY BY AGE PERIODS
(1929)

Age Period (Years)	In Villages						Outside of Villages						Total	
	Bruce		Sinai		Oslo		Oakwood		Parnell		Argo		No.	Percent of Total
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Under 5	30	8.96	17	8.72	40	9.57	45	11.97	45	11.39	41	11.85	218	10.56
5-19	111	33.13	67	34.36	128	30.70	106	28.19	134	33.93	135	39.02	681	32.99
20-44	108	32.24	59	30.26	156	37.41	143	38.03	118	29.87	111	32.08	695	33.67
45-64	42	12.54	24	17.44	57	13.69	51	13.57	36	9.12	44	12.72	264	12.79
65	24	7.16	16	8.20	20	4.79	16	4.25	20	5.06	5	1.44	101	4.90
Unknown	20	5.97	2	1.02	16	3.84	15	3.99	42	10.63	19	2.89	105	5.09
Total	335		195		417		376		395		346		2064	

of the children, the amount of milk consumed might have been raised. The percentage of children in town receiving hot lunch was excellent. This is probably due to the fact that the town children went home for lunch.

The percentage of children fussy about their food was high in town and country. The percentage of children eating vegetables was also high in town and country. When this was checked against Table 1, it seemed that the children had eaten vegetables, but not regularly.

The number of children drinking milk were fair. Eighty per cent replied in the affirmative for the country, and eighty-five per cent in town.

Taken as a whole the food habits of farm families in the four townships and two small towns were found to be fairly good. To a considerable extent this condition reflects the influence of home economics extension work¹ carried on in the country. A probable contributing factor, was the reading of nutrition articles in farm and home magazines on the part of farm women.²

Prevalence of Diseases and Disorders

In order to have a broad basis for comparison with respect to the incidence of disease in both eastern and western South Dakota, 40 counties³ were selected and arranged into groups of 20 counties each.

Selected Counties Having Good and Poor Health Facilities

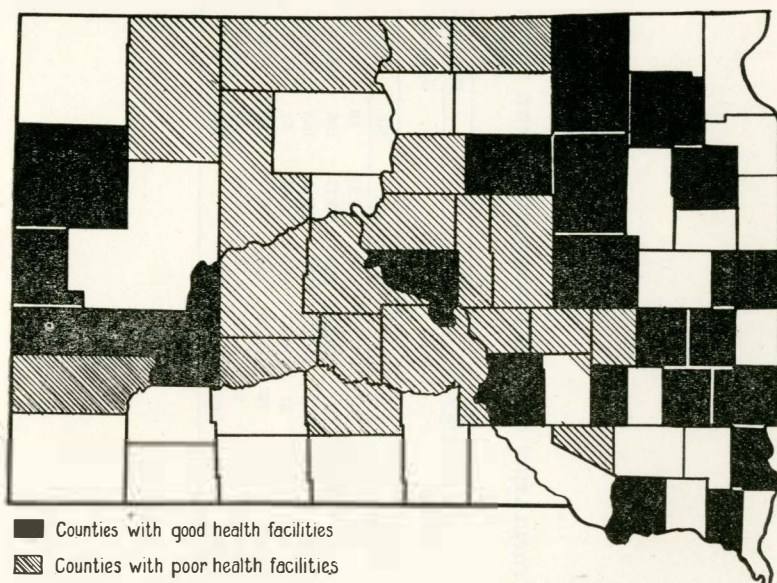


Figure 19—Forty selected counties in South Dakota having good and poor health facilities. (1926)

¹ Since 1924 Brookings county has maintained an average of 15 women's home extension clubs, cooperating with the Extension Service of State College.

² A survey covering two townships in Lake county in 1927 reveals the fact that 61% of the farm homes subscribe to a woman's magazine, and 83% subscribe to farm journals.

³ The data for these counties were selected from the annual report of the South Dakota State Board of Health, for 1922 to 1927 inclusive.

TABLE 22

SHOWING NUMBER OF DEATHS BY COUNTIES FROM SELECTED COMMUNICABLE DISEASES.

AVERAGE DEATH RATE FOR SIX YEARS PER THOUSAND PER ANNUM.

20 Counties having good health facilities	Diphtheria	Infantile Paralysis	Influenza	Measles	Meningitis	Scarlet Fever	Whooping Cough
Beadle	.1	.1	.4	.1	.1	.1	.1
Bon Homme	.2	.1	.2	.1	.1	.1	.1
Brookings	.1	.1	.4	.1	.1	.2	.1
Brown	.1	0	.4	.1	.1	.1	.1
Brule	.1	0	.7	.1	.2	.3	.1
Butte	.5	.2	.5	.2	.2	.2	.4
Clay	0	.1	.2	.1	.1	0	.2
Codington	.1	.1	.3	.1	.1	.1	.1
Davison	.1	0	.4	.2	.1	.1	0
Day	.1	.1	.4	.1	.1	.1	.2
Faulk	.3	.1	.4	.2	.1	.7	.1
Hughes	.3	0	.8	.1	.1	0	.1
Lake	.1	.1	.7	.2	.1	.1	.1
Lawrence	.1	.1	.4	.2	.1	.2	.2
Lincoln	.1	.1	.3	.1	.1	.1	.1
McCook	.1	0	.3	.1	.1	.1	0
Miner	.3	.1	.6	.4	.3	.1	.1
Minnehaha	.1	0	.3	.1	.1	.1	0
Pennington	.1	.1	.2	.2	.1	.2	.2
Spink	.2	0	.5	.3	.1	.1	.2
AVERAGE	.16	.07	.42	.16	.12	.15	.18

TWENTY COUNTIES HAVING POOR HEALTH FACILITIES

Buffalo	0	0	.4	0	0	.4	.9
Campbell	.3	0	.3	.3	0	0	.2
Corson	0	0	.2	.5	.2	.1	.1
Custer	.2	0	.3	0	0	0	.2
Douglas	.1	0	.4	.1	0	.1	.1
Haakon	0	0	.4	0	0	0	.3
Hand	0	0	.6	.2	.1	.2	.1
Hyde	.3	0	1.2	.3	0	.4	.3
Jackson	.4	.4	.5	0	.4	.4	.4
Jerauld	.5	0	.6	0	.2	.3	.2
Jones	.5	0	.4	0	.5	.3	.5
Lyman	0	0	.3	.1	0	.3	.1
McPherson	.3	.1	.1	.1	0	.2	.1
Mellette	.2	.2	.4	.2	.2	0	.6
Perkins	0	.1	.3	.2	0	.4	0
Potter	.2	0	.4	0	.2	.8	.2
Sanborn	.3	0	.5	.3	.1	.1	.1
Stanley	0	0	.5	0	0	0	0
Sully	0	0	.3	0	.3	0	.3
Ziebach	0	0	1.0	0	0	.2	.5
AVERAGE	.16	.04	.46	.12	.11	.21	.26

The first group was selected as representing 20 counties with fairly good health facilities, as regards the number and distribution of physicians, dentists, and hospitals, etc. The second group was selected as representing 20 counties with somewhat poorer health facilities. (See Figure 19).

Table 22 shows the average number of deaths per thousand per annum in the six years from 1922-1927 inclusive in the two groups of counties, from certain selected communicable diseases. Table 23 shows the same type of data selected from the same counties with respect to non-communicable diseases.

TABLE 23
SHOWING NUMBER OF DEATHS BY COUNTIES FROM SELECTED NON-COMMUNICABLE DISEASES.

AVERAGE DEATH RATE FOR SIX YEARS PER THOUSAND PER ANNUM.

Twenty Counties With Good Health Facilities

	Appendicitis	Bright's Disease	Cancer	Diabetes	Diarrhea & Enteritis	Heart Disease	Acute Nephritis	Pneumonia	Septicemia	Typhoid Fever
Beadle	.2	.4	.5	.1	.2	.6	.1	.6	.1	.1
Bon Homme	.2	.4	.6	.2	.2	.9	.1	.6	.1	.1
Brookings	.1	.4	.9	.2	.2	.8	.1	.5	.1	0
Brown	.3	.6	.6	.2	.2	.8	.1	.8	.1	.1
Butte	.3	.4	.3	.3	.2	.6	.2	.7	0	.2
Clay	.1	.5	.4	.1	.2	.7	.1	.7	.1	0
Codington	.3	.5	.9	.2	.2	1.0	.1	.6	.3	.1
Davison	.7	.7	1.0	.2	.1	.9	.1	.7	.1	.1
Day	.2	.4	.6	.2	.4	.9	.1	.6	.1	.1
DeRue	.2	.6	.7	.3	.2	1.0	.2	.9	.1	.2
Faulk	.2	.6	.4	.1	.3	.5	.1	.9	.2	0
Hughes	.3	.4	.4	.2	.4	1.3	.3	.6	.2	.2
Lake	.3	.4	.8	.2	.2	.8	0	.6	.1	.1
Lawrence	.3	.7	1.2	.2	.3	.9	.1	.8	.2	.1
Lincoln	.1	.5	.8	.1	.1	.8	.1	.6	.1	.1
McCook	0	.3	.7	.1	.1	1.0	.1	1.1	.1	.1
Miner	.1	.3	.5	.2	.2	.7	.1	.4	0	.1
Minnehaha	.2	.7	1.1	.2	.2	.9	0	.8	.1	0
Pennington	.2	.4	.5	.1	.1	.8	.1	.7	.2	.1
Spink	.1	.5	.5	.2	.3	.8	.1	.8	.1	.1
AVERAGE	.22	.49	.67	.18	.21	.83	.12	.7	.12	.095

Twenty Counties With Poor Health Facilities

Buffalo	.4	.4	.6	0	.6	1.3	0	1.1	0	0
Campbell	.2	.2	.6	.2	.3	.5	0	.6	0	.2
Corson	.1	.1	.8	.1	.3	.3	.1	.7	0	.1
Custer	0	.3	.5	0	.2	1.0	0	.3	0	0
Douglas	.2	.3	.7	.3	.3	.8	.1	.5	.1	.1
Haakon	.2	.2	.2	0	.2	.2	0	.2	.2	0
Hand	.2	.4	.5	.2	.3	.5	.2	.5	.2	.1
Hyde	0	.5	.5	.3	.3	.6	.3	.4	0	0
Jackson	0	.5	.6	.4	.7	.6	0	.8	.4	0
Jerauld	0	.4	.5	.2	.2	.6	.2	.6	.2	0
Jones	.3	.4	.5	.3	.3	.4	.3	.5	.3	.3
Lyman	0	.3	.3	.1	.3	.3	0	.4	.3	.1
McPherson	.1	.4	.5	.2	.2	.3	0	.4	.1	.1
Mellette	.2	.2	.4	0	.5	.2	.2	1.3	.2	0
Perkins	.2	.3	.4	.1	.2	.7	.1	.5	0	.1
Potter	0	.3	.5	.2	0	.6	0	.5	0	.2
Sanborn	0	.2	.4	.3	.2	.7	.1	.5	0	.1
Stanley	0	.8	.4	.4	.6	1.0	.4	.6	0	0
Sully	0	.3	.4	0	.3	.6	.3	.5	.3	.3
Ziebach	0	.2	.2	.2	.5	.5	.2	.8	0	1.0
AVERAGE	.1	.32	.45	.18	.33	.59	.13	.59	.12	.14

TABLE 24

INFANT AND MATERNAL DEATH RATE BY COUNTIES PER THOUSAND BIRTHS
PER ANNUM

20 Counties having good health facilities	Death Rate Per 1000 births under one month.	Death Rate Per 1000 births under one year.	Death Rate Per 1000 births under five years.	Death Rate per 1000 births maternal.
Beadle -----	41.6	62.1	83.4	4.4
Bon Homme -----	33.7	54.7	69.7	4.2
Brookings -----	33.0	46.2	64.9	5.4
Brown -----	40.0	55.8	76.8	6.3
Brule -----	35.1	54.1	75.6	10.4
Butte -----	34.6	56.5	77.6	10.1
Clay -----	30.9	53.4	69.2	7.8
Codington -----	28.6	53.3	80.5	5.7
Davison -----	36.9	53.7	75.7	4.6
Day -----	35.7	54.8	76.1	5.7
Faulk -----	27.8	51.9	63.5	10.1
Hughes -----	22.4	38.6	53.9	8.9
Lake -----	35.7	61.4	83.0	9.3
Lawrence -----	44.7	71.5	85.0	9.5
Lincoln -----	37.8	50.4	63.9	5.6
McCook -----	55.5	77.7	92.9	0
Miner -----	32.5	51.7	68.2	5.5
Minnehaha -----	34.3	58.6	76.5	3.5
Pennington -----	27.2	49.1	70.0	9.1
Spink -----	33.0	49.5	63.4	5.8
AVERAGE -----	35.1	55.2	73.5	6.3
Counties having poor health facilities:				
Buffalo -----	47.9	82.4	95.8	0
Campbell -----	44.1	92.3	115.8	12.7
Corson -----	41.4	77.2	108.8	7.4
Custer -----	21.9	48.7	56.2	0
Douglas -----	30.1	46.5	63.9	0
Haakon -----	45.0	13.1	85.3	1.1
Hand -----	33.8	50.8	59.0	8.8
Hyde -----	31.3	63.0	83.4	9.5
Jackson -----	60.3	91.9	120.8	22.4
Jerauld -----	47.9	48.2	92.7	6.9
Jones -----	35.2	39.3	57.2	32.8
Lyman -----	26.9	54.0	82.9	0
McPherson -----	37.9	61.6	74.6	3.5
Mellette -----	26.7	96.4	130.8	8.4
Perkins -----	36.0	51.7	83.1	7.8
Potter -----	27.4	43.6	50.6	5.7
Sanborn -----	40.3	71.1	100.6	6.0
Stanley -----	44.8	40.5	43.3	54.0
Sully -----	53.6	49.7	74.0	12.9
Ziebach -----	45.3	67.0	110.8	9.3
AVERAGE -----	38.9	62.4	84.5	10.5

While the advantage of a lower death rate in most cases rests with the counties having good health facilities, there are certain notable exceptions that are difficult to explain. One possible explanation of this situation is that with the more dangerous diseases such as infantile paralysis, meningitis, appendicitis, brights disease, cancer, heart disease, and pneumonia, the patients have been removed from their own county and sent for better treatment to the nearest county with adequate health facilities. Thus if death ensues, it is credited to the county where the patient dies.¹

Considering the maternal and infant death rates in these two groups of counties as shown in Table 24, the advantage is very distinctly with the group having the best health facilities. This is natural of course as proper medical aid is such a vital factor in preventing an excessive death rate among mothers and infants in puerperal cases.

In connection with all the confinement cases which took place in four townships and two small towns in one year, it is noteworthy that approximately one-fourth of the cases were cared for at hospitals, and of the remainder all had medical care except three cases in the village of Bruce. (Table 25). This trend toward making greater use of hospitals for confinement cases marks a decided advance in rural health practices.

The amount of sickness during 1929 for both adults and children is shown in Table 26. The findings indicate that in proportion to their numbers, children are sick less often than adults and for a shorter duration of time. It also appears that there is a smaller percentage of sickness in the village populations than on the farms. Table 27 shows the incidence of certain classified adult disorders for the year, arranged in a decreasing scale according to the number of cases which have occurred. Table 28 shows similar data and arranged in similar fashion with respect to children disorders.

Foot difficulties with consequent trouble in buying shoes, appears to be much more prevalent and serious than commonly supposed, as shown in Table 29.

Health Costs

The average total health costs for farm families for one year appear to be approximately \$64, as shown in table 30. A similar average was obtained from estimates and individual questionnaires from 435 families² in six other counties of the state, as shown in Table 31.

In the itemized costs the doctors' fees constitutes the largest item, the dentists' charges the second, and hospital charges are next.

Table 32 covers the cost of medical, hospital, and nurses services for adults.

For confinement cases taken care of by the doctor in the patient's home, the average cost was \$33.39. The average doctor's fee for taking

1 There are of course many other possible explanations for the lower death rate from selected diseases in the counties with the poorer health facilities. The sparse population in the western counties may reduce the spread of certain epidemics. The climatic conditions and other environmental differences may also have an influence on the death rate from certain diseases.

2 These figures in the six counties have been obtained by extension specialists in connection with economic conferences held during the past two years (1929-30)

TABLE 25

CARE GIVEN TO CONFINEMENT CASES IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY

Hospital		Doctor and Practical Nurse		Doctor and Hired Help		Other Practical Nurse		Midwife		
No.	%	No.	%	No.	%	No.	%	No.	%	
Oslo -----	12	25.	26	59.1	5	11.4	1	2.1	0	0
Oakwood -----	3	12.5	0	0 0	21	87.5	0	0	0	0
Parnell -----	5	29.4	10	58.8	1	5.8	1	5.8	0	0
Argo -----	5	29.4	11	64.7	1	5.8	0	0	0	0
Bruce Village -----	3	20.	8	53.3	0	0	1	6.7	3	20
Sinai Village -----	6	37.5	8	50.	0	0	2	12.5	0	0

TABLE 26

THE AMOUNT OF SICKNESS IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY
(1929)

Persons Ill					Cases in Bed				Cases Not in Bed			
Adults			Children		Adults		Children		Adults		Children	
No.	Average No. Days	No.	Average No. Days	No.	Average No. Days	No.	Average No. Days	No.	Average No. Days	No.	Average No. Days	
Argo -----	45	36.9	30	6.4	37	14.2	17	4.5	24	44.4	23	4.4
Oakwood -----	115	23.3	42	11.8	44	16.2	20	9.2	48	28.1	19	9.1
Oslo -----	70	23.5	43	7.4	53	16.3	37	5.7	16	39.8	12	9.1
Parnell -----	57	20.6	74	9.5	39	8.9	63	6.3	42	14.4	63	4.5
Bruce -----	41	14.8	37	8.5	26	14.4	19	5.4	5	15.6	9	8.4
Sinai -----	17	10.9	16	12.9	13	7.8	13	9.6	2	20.0	9	7.7

TABLE 28

CHILDREN'S DISORDERS
(1929)

	Influenza	Scarlet Fever	Eye & Ear Trouble	Measles	Operations	Tonsils & Adenoids	Stomach Trouble	Appendicitis	Spine Trouble	Bones	Bladder	Feet Troubles	X-ray Examination	Circumcised	Miscellaneous
Arco Township	14		2	1		2		1		1		1			11
Oakwood Township	15	3		4		4	2				1				18
Oslo Township	10	12	2	2	1	3	2	2	1		1	1	1	2	5
Parnell Township	4	1	1	17	1	2	2				1				10
Bruce	2	1	1		1	6	1	2							9
Sinai	6	3		6	1	1									

TABLE 29

NUMBER AND PERCENTAGE HAVING FOOT DIFFICULTIES IN FOUR TOWNSHIPS AND TWO TOWNS IN BROOKINGS COUNTY

	Bunions		Corns		Falls	n Arches	Know Points In Buying Shoes			Trouble Obtaining Them					
							Yes		No.		Yes		No.		
	No.	%	No.	%			No.	%	No.	%	No.	%	No.	%	
Oslo	3	10.7	19	67.9	6		21.4	32	64.	18	36.	6	8.6	64	91.4
Oakwood	3	20.	6	40.	6		40.	5	83.3	1	16.7	15	42.8	20	57.1
Parnell	8	21.6	23	62.2	6		16.2	7	29.2	17	70.8	4	7.4	50	92.6
Argo	6	14.3	28	66.7	8		19.0	12	31.6	26	68.4	11	17.7	51	82.3
Bruce Village	5	13.5	24	64.9	8		21.6	17	48.6	18	51.4	9	17.6	42	82.4
Sinai Village	0	0	5	55.5	4		44.4	15	83.3	3	16.6	4	12.5	28	87.5

TABLE 30

TOTAL HEALTH COST IN FOUR TOWNSHIPS AND TWO TOWNS IN BROOKINGS COUNTY

	Doctor	Dentist	Hospital	Drugs	Nurse	Optical	Total
Oslo -----	\$16.51	\$9.96	\$18.49	\$3.32	\$.92	\$2.01	\$51.21
Oakwood -----	47.00	8.80	24.77	7.07	.20	.85	88.69
Parnell -----	32.52	5.89	7.37	2.74	2.07	1.48	52.07
Argo -----	34.42	7.21	9.30	3.63	7.39	1.91	63.86
TOTAL AVERAGE -----	\$32.61	\$7.97	\$14.98	\$4.19	\$2.65	\$1.56	\$63.96
Bruce -----	\$13.39	\$8.88	\$11.73	\$2.70	\$.05	\$.59	\$37.34
Sinai -----	19.31	14.44	2.80	2.30		3.15	42.00
TOTAL AVERAGE -----	\$16.35	\$11.66	\$ 7.26	\$2.50	\$.025	\$1.87	\$39.67

TABLE 31

TOTAL ITEMIZED HEALTH COSTS OF 435 FARM FAMILIES FOR ONE YEAR IN SEVEN SOUTH DAKOTA FAMILIES

County	No. of families involved	Doctor	Dental	Hospital	Drug	Total Average
Brown -----	154	\$35.56	\$ 8.77	\$ 7.87	\$5.94	\$58.14
Yankton -----	11	53.18	18.77	13.91	3.91	87.77
Day -----	53	17.38	10.75	11.47	5.88	45.48
Brookings -----	52	22.27	10.21	5.59	2.85	40.92
Codington -----	66	19.31	11.79	6.70	6.58	44.38
Minnehaha -----	63	57.91	15.20	32.48	3.97	109.56
Turner -----	36	Total 25.19	23.96	14.63	6.47	70.25
	435 Average	32.97	\$14.22	\$13.22	\$5.09	\$65.50

TABLE 32

THE COST OF MEDICAL, HOSPITAL AND NURSES SERVICES FOR ADULTS IN FOUR TOWNSHIPS AND
TWO SMALL TOWNS IN BROOKINGS COUNTY.

	Doctor's Calls at Patient's Home		Patient's Calls at Doctor's Office		Doctor's Fees at Hospital for		General Hos- pital Service		Trained Nurse Costs		Prac. Nurse Costs		Cases Having Home Care Only			
	Confinement and Miscarriage	Other Sickness	Operations	Other Sickness	Confinement Cases		Other Sickness	Confinement Cases	Trained Nurse Costs	Prac. Nurse Costs	Cases Having Home Care Only	Cases Having Home Care Only	Cases Having Home Care Only			
	No.	Average Cost Per Call	No.	Average Cost Per Call	No.	Average Cost Per Operation	No.	Average Cost Per Call	No.	Average Cost Per Call	No. Days	Average Cost Per Day	No. Days	Average Cost Per Day	No. Days	Cost Per Day
Argo -----	7	33.86	16	7.94	12	169.17	62	3.40	2	30.00	133	4.93	74	7.35	9	2.00
Oakwood ---	8	33.00	29	6.17	13	126.23	407	2.86	4	28.25	311	5.78			7	2.14
Oslo -----	6	35.83	36	6.74	9	102.33	78	3.45	2	30.00	204	4.34	5	2.00	66	1.05
Parnell -----	9	30.89	27	5.04	8	192.75	85	3.42	4	32.50	140	5.62	25	4.76	23	1.00
AVERAGE		33.39		6.47		147.62		3.28		30.19		5.17		4.70		1.55
Bruce -----	0	0	15	7.70	6	110.00	28	2.52	2	43.50	205	4.82	0	0		
Sinai -----	0	0	33	6.70	2	107.50	45	2.33	1	25.00	27	4.61	0	0		
AVERAGE	0	0		7.20		108.75		2.42		34.25		4.71		0		

TABLE 33

THE COST OF MEDICAL, HOSPITAL AND NURSES SERVICES FOR CHILDREN IN FOUR TOWNSHIPS AND TWO SMALL TOWNS
IN BROOKINGS COUNTY

Doctor's Calls at Patient's Home			Patient's Calls at Doctor's Office				General Hos- pital Service	Trained Nurse Costs	Cases Having Home Care Only	
			Operations	Other Sickness						
	No.	Average Cost Per Call	No.	Average Cost Per Operation	No.	Average Cost Per Call	No. Days	Average Cost Per Day	No. Days	Average Cost Per Day
Argo -----	4	4.75	3	33.00	24	3.02	31	4.35	9	9.33
Oakwood -----	9	4.61	4	32.00	40	2.54	14	3.50	0	0
Oslo -----	17	7.88	2	87.50	25	3.78	34	3.88	0	0
Parnell -----	13	6.88	5	44.00	17	3.76	24	5.38	0	0
AVERAGE		6.03		49.12		3.27		4.28		9.33
Bruce -----	4	4.67	7	79.71	41	2.83	55	6.00	2	2.00
Sinai -----	14	6.71	2	77.50	3	2.00	0	0	0	0
AVERAGE		5.69		78.60		2.41		6.00		2.00

TABLE 34

THE DEGREE OF ADEQUACY IN LOCAL HEALTH SERVICE AS EXPRESSED BY THE FAMILIES IN FOUR TOWNSHIPS AND TWO SMALL TOWNS IN BROOKINGS COUNTY

	Family Doctor				Average No. of Years	Average Miles Distance Away	Is Medical Ser- vice Satisfactory?		Is General Health vice adequate?	
	Yes		No.				Yes	No	Yes	No
	No.	%	No.	%						
Oslo -----	47	61.8	29	38.2	13.8	8.16	58	1	48	3
Oakwood -----	40	88.9	5	11.1	7.4	7.16	16	0	1	0
Parnell -----	34	66.7	17	33.3	9.4	7.00	31	0	30	1
Argo -----	9	19.6	37	80.4	5.8	15.00	9	0	26	4
Bruce -----	9	18.8	39	81.2	7.5	12.25	8	0	19	20
Sinai -----	26	63.4	15	36.6	13.9	13.61	27	0	34	5

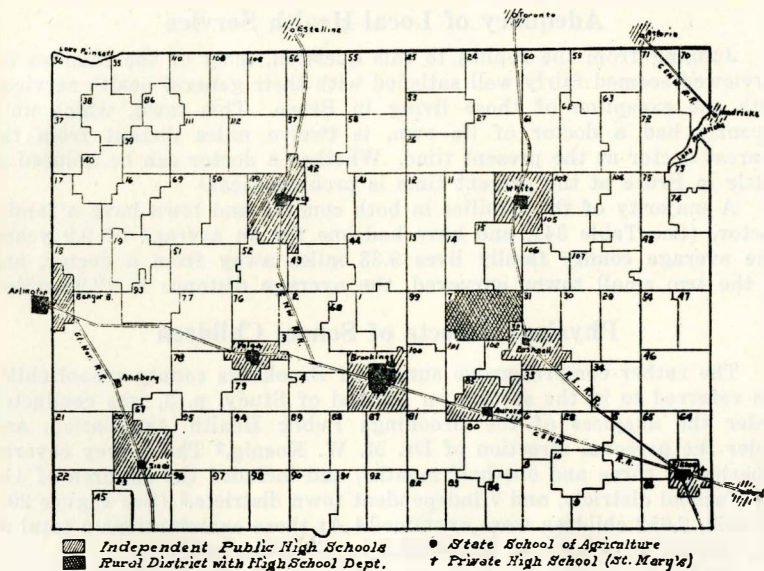


Figure 20—Various types of school districts in Brookings county.

care of confinement cases in the hospital was \$30.19. All confinement cases for the year in the two small towns were taken care of at the hospital at an average cost of \$34.25.

Several notable changes are taking place in the type of health service rendered to both country and small town people. The use of a trained nurse in the private home is decreasing rapidly. To some extent the practical nurse and home care are being substituted, but more often the patient is taken to the doctor's office, or if serious enough, to the hospital. A glance at table 30 again will show that the usual cost of hospital care per day is no greater than the cost of hiring a trained nurse, and the arrangement may be carried out with less inconvenience to both the patient and his or her family.

While the use made of the doctor's services has probably increased in each community, he is called less often into the country homes. This is due mainly to the increased cost of mileage charged by the doctor. The customary mileage¹ charge \$1 per mile one way, in addition to the \$3 charge for the residence call. The result is that usually the patient is bundled into a sedan car and calls at the doctor's office.

Table 33 shows the cost of medical, hospital, and nurses services for children. Generally speaking the costs are lower in all items. The only exception to the high average cost in the trained nurse item, is due to a special non-typical situation.

¹ This charge is authorized by the South Dakota Medical Association. All doctors do not make the full mileage charge however. The practice seems to vary considerably.

Adequacy of Local Health Service

Judging from the replies to this question, most of the families interviewed seemed fairly well satisfied with their general health services, with the exception of those living in Bruce. This town, which until recently had a doctor of its own, is twelve miles distant from the nearest doctor at the present time. Whether a doctor can be induced to settle in Bruce at the present time is problematical.¹

A majority of the families in both country and town have a family doctor, (See Table 34), and have had one for an average of 9.9 years. The average county family lives 9.33 miles away from a doctor, and in the two small towns surveyed, the average distance is 12.93 miles.

Physical Defects of School Children

The rather comprehensive survey of Brookings county school children referred to in the section on Method of Study, p. 3, was conducted under the auspices of the Brookings Public Health Association, and under the personal direction of Dr. M. W. Koenig.² The survey covered a period of three and one-half months, and included the children of 110 rural school districts, and 7 independent town districts.³ (See Figure 20). All told, 2,652 children were examined.⁴ At these examinations a total of 501 parents were present in addition to 137 other visitors.

While the 2,652 individual schedule cards as filled in by Dr. Koenig and her helper gave in detail the scientific names of some 204 physical defects of the children examined, the problem of the writer was to translate these into common terms, intelligible to the average layman in health matters, and to reduce the number of defects into a few general categories. The results of this undertaking are shown in tables 35 and 36, setting forth the total number of defects under 14 headings for both country and town children. As an aid to evaluating the significance of percentages used in these two tables, the reader is referred first to table 37, indicating the number of children involved in each age group by school districts.

Bone defects came fourth, 1,365 manifesting some skeletal imperfection, such as rachitic changes noted in chest development, bowlegs, knock-knees, joint enlargements and other structural deviations as seen in foot pronation, rotating or weak ankles, falling arches and complete flat foot.

One thousand one hundred and eighty-eight showed skin lesions of varying types, eczema, pigmented or other moles, warts, dandruff, eruptions, among them itch or scabies of which 38 cases were found.

1 The State Board of Health (1926) reports that a number of small towns under 400 are having difficulty in finding a doctor to locate in them.

2 Dr. M. W. Koenig is a trained and experienced physician sent out to the various counties on cooperative public health projects by the South Dakota State Board of Health. The costs of the projects within the county are paid for out of local county public health association monies collected from the sale of Christmas seals.

3 The only school district not included was the independent district of the city of Brookings.

4 Because of lack of time to completely summarize all the data, the tables include only the defects of children from 0 to 13 years of age in both town and country. As indicated in table 37, the rural pupils of these age groups total 1595, and the town pupils, 602. Tabulated data for the remaining 455 pupils from 14 to 19 inclusive will be furnished upon written request.

TABLE 35
AVERAGE PERCENTAGE OF PHYSICAL DEFECTS FOUND AMONG COUNTRY CHILDREN FROM SIX TO FOURTEEN YEARS OF AGE IN BROOKINGS COUNTY

	Ages							Total Average
	6	7	8	9	10	11	12	
	Average of Percentages							
Throat -----	84.96	84.26	79.00	89.61	84.22	83.96	86.74	84.89
Nose -----	33.74	37.35	33.78	39.09	41.43	33.70	31.61	35.97
Glands -----	45.61	41.87	33.57	27.57	30.09	27.17	22.48	31.40
Teeth -----	71.13	79.56	81.30	84.74	79.48	76.48	81.91	78.62
Ears -----	3.61	6.26	4.65	7.74	5.35	9.52	5.00	6.34
Overweight -----	.39	.78	2.91	1.48	2.22	3.30	2.87	2.48
Underweight -----	14.26	18.35	13.65	31.96	32.56	27.64	29.87	24.51
Heart -----	19.69	19.17	21.69	24.65	20.61	16.39	14.83	18.64
Lungs -----	26.52	22.22	18.04	17.26	9.74	12.65	6.09	15.27
Bones -----	58.48	57.52	57.52	66.69	61.61	68.74	69.35	63.28
Posture -----	74.82	81.22	81.30	87.00	85.17	81.69	81.04	81.51
Mal-Nutrition -----	.74	.52	.39	1.43	.35	1.17	3.39	1.00
Eyes -----	23.43	32.65	23.83	28.00	31.65	35.43	26.43	28.48
Skin -----	24.83	32.35	32.78	36.83	47.56	47.35	36.39	40.06

TABLE 36

AVERAGE PERCENTAGE OF PHYSICAL DEFECTS FOUND AMONG VILLAGE AND TOWN SCHOOL CHILDREN FROM SIX TO FOURTEEN YEARS OF AGE IN BROOKINGS COUNTY

	Ages							Total Average
	6	7	8	9	10	11	12	
	Average of Percentages							
Throat -----	91.34	86.86	82.00	73.43	95.15	87.86	81.00	86.03
Nose -----	50.50	38.86	57.71	37.86	44.29	43.14	47.28	44.06
Glands -----	49.00	62.86	50.00	47.43	45.85	45.36	35.85	46.76
Teeth -----	89.00	96.86	97.71	89.71	94.28	85.85	81.14	88.28
Ears -----	11.67	5.00	0	4.57	3.57	1.57	5.85	4.29
Overweight -----	.67	0	1.00	1.71	3.57	1.57	0	1.69
Underweight -----	23.33	18.29	25.85	18.43	25.43	40.14	23.71	26.45
Heart -----	26.00	41.71	42.71	31.29	31.00	38.00	15.71	29.77
Lungs -----	35.33	43.86	42.43	15.71	16.11	12.00	8.57	22.64
Bones -----	63.17	57.00	66.00	47.86	69.00	70.28	88.43	65.22
Posture -----	89.00	81.00	87.86	80.71	88.00	83.57	81.71	84.02
Mal-Nutrition -----	12.16	6.29	5.14	0	1.57	3.57	4.71	5.32
Eyes -----	17.67	35.71	21.71	24.43	26.57	40.00	25.86	26.43
Skin -----	21.33	47.14	34.43	41.11	43.00	51.14	47.28	43.57

TABLE 37

NUMBER OF RURAL AND TOWN PUPILS IN BROOKINGS COUNTY

Rural (Townships)	6	7	8	9	10	11	12	13
	No. of Pupils	No. of Pupils	No. of Pupils	No. of Pupils	No. of Pupils	No. of Pupils	No. of Pupils	No. of Pupils
Afton -----	11	12	13	12	7	12	8	9
Alton -----	9	10	7	11	10	7	12	4
Argo -----	9	9	10	8	9	13	6	9
Aurora -----	10	6	9	9	8	16	9	5
Bangor -----	12	13	15	13	17	15	10	10
Brookings -----	10	8	7	2	10	8	7	6
Elkton -----	4	2	2	3	6	3	3	5
Eureka -----	8	7	6	9	9	7	5	8
Lake Hendricks -----	5	10	13	8	12	12	8	3
Lake Sinai -----	10	9	8	12	10	8	16	2
Laketon -----	11	12	9	8	10	9	7	13
Medary -----	10	9	15	12	12	11	8	9
Oak Lake -----	15	8	19	13	8	11	12	10
Oakwood -----	8	8	9	3	18	6	4	4
Oslo -----	9	7	10	7	10	6	11	10
Parnell -----	11	8	11	8	9	7	13	6
Preston -----	11	10	11	8	10	9	8	8
Richland -----	15	9	7	5	13	7	4	11
Sherman -----	9	8	5	8	8	5	9	5
Sterling -----	11	14	5	14	8	9	8	12
Trenton -----	10	5	8	7	14	6	12	8
Volga -----	4	5	7	2	3	4	4	4
Winsor -----	7	5	7	6	8	9	4	8
TOTAL -----	219	194	217	188	224	199	188	166
TOWNS (Incorporated)								
Aurora -----	3	9	4	14	4	10	6	8
Bruce -----	13	10	9	9	14	9	6	15
Bushnell -----	0	6	8	5	5	3	3	8
Elkton -----	21	22	27	17	22	11	26	20
Sinai -----	5	8	10	6	11	6	3	12
Volga -----	10	13	12	16	13	19	18	21
White -----	2	13	7	14	11	5	4	16
TOTAL -----	54	81	77	81	80	63	66	100

RURAL HEALTH SITUATION IN SOUTH DAKOTA

Development of full-time county health units in the United States

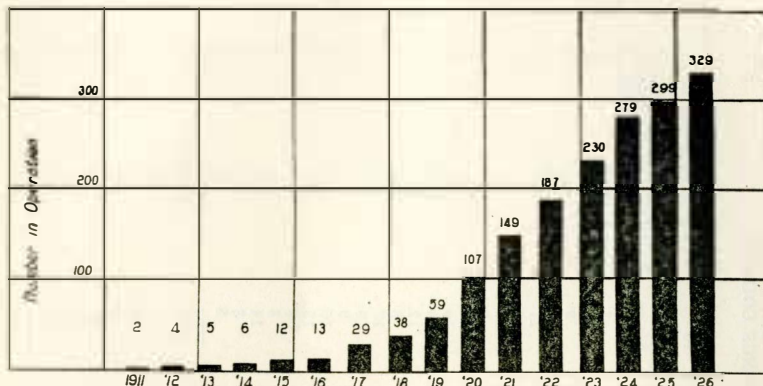


Figure 21—Showing the progressive development of full-time county health units in the United States. (1911-1926) (Adopted from article, by Covington, American Medical Association Journal, August 28, 1926.)

In one thousand fourteen cases some defect of the nose was apparent: enlarged turbinates, nasal obstruction, deflected septum conditions were contributory factors. Eight hundred thirty-four evidenced glandular enlargement, chiefly in the glands of the neck. Some eye trouble such as irritation, simple conjunctivitis, and crusty eye lids was observed in 209 children. Forty-six showed a granular condition of the eyelids. Fourteen cases of pinkeye came under observation. There were noted 63 cases of "cross-eye" of which 13 were corrected by glasses. One had an operation but the condition still persists.

Five hundred and twenty-five children showed heart defects such as disturbance of rhythm, labored or overtaxed hearts, especially in rapidly growing boys. Functional and organic murmurs (only five of the latter) and accentuation of the second sound were found. Three hundred fifty-five manifested some impairment of the upper respiratory tract, particularly harshness. Much influenza among children might account for much of the two latter conditions. Sixty-nine of the number showed some ear defect.

In 80 children some nervous instability was present, viz irritability, sensitiveness, stuttering, "fidgetiness," retardation, and mental goiter tendency, of which 17 were real goiters. In 35 of these thyroid conditions there was a history of family tendency.

Thirty-four children showed deformities varying from slight cripplings caused by fractures and dislocations to deformities from infantile paralysis, arthritis and congenital causes. There was one case of harelip.

Four hundred and thirty-three of the 2,652 children examined had had tonsillectomies or tonsil and adenoid operations. Two hundred and eighty of this number had come back to a normal health standard. One hundred fifty-three were still below par physically due perhaps to other defects retarding complete coming back or that the tonsils had not been removed early enough, that is before too many constitutional symptoms

developed. There were found 24 cases showing hernias and 21 with an umbilical weakness. One child was found whom parents stated had never talked. Two cases of tuberculosis, one bone and one pulmonary came under observation.

Immunization against the transmissible diseases were as follows: smallpox, 823, diphtheria, 9, scarlet fever, 7, and typhoid, 2. The histories of many of the children showed that they had had smallpox but this was not tabulated as we were not sure of its accuracy. Much measles, smallpox, chickenpox, pinkeye, and some scarlet fever was encountered during the survey.

Comparing the two groups of pupils on the basis of residence, the country children made a better showing than the small town children in all respects, except in the cases of ear, eye, and overweight defects. This is rather interesting considering the fact that the country children operate under a spatial handicap in not being easily accessible to medical aid.

Summary and Conclusions

In summarizing the findings of this study what light if any is thrown on the questions presented in the introductory sections of Part I, pages one and two? Briefly the following conclusions are offered as an answer at least in part to these questions:

1. In general indications point to the effect that South Dakota compares fairly well with the rest of the country in health progress. It is impossible, however, to make accurate comparisons with other states in such matters as general death rates, maternal and infant mortality, morbidity rates, birth rates, expectancy of life, etc., because South Dakota has not been in the official birth and death registration area of the United States, and accordingly her vital statistics have been computed on a different basis.¹

2. From the standpoint of the number and distribution of health agencies in the state, it is evident that the 14 so called urban counties have a decided advantage over a like number of rural counties. (See Table 6.) A similar showing of advantage was made between urban and rural counties with respect to their comparative maternal and infant death rates, and in the number of deaths resulting from communicable and non-communicable diseases. (Tables 22, 23, 24.). Exceptions to this rule apparently can be accounted for satisfactorily.

3. With respect to the organization of public health work, South Dakota has a fairly sound and workable plan. (Figure 8). The chief difficulty seems to lie in a lack of sufficient funds to carry out a reasonably comprehensive program. For a number of years the State Board of Health has not been able even to man certain of its **important departments**. The state health laws enabling counties under certain conditions to establish county health units and county hospitals are well drawn, but as yet the great majority of counties have not considered local health needs to be particularly pressing.

4. A glance at Figures 13, 14, 15, 16, 17, 18 and 19 will show that the various health agencies are not equally available and accessible to

¹ In a letter from the chief statistician for vital statistics in the U. S. Bureau of the Census, it is estimated that there is a probable error of more than 10 per cent in our South Dakota vital statistics records due to the way in which births and deaths are reported indirectly instead of directly to the State Board of Health.

all parts of the state. This condition is due mainly to economic conditions and the variation in density of population.

5. Considering the spatial handicap under which farm people operate relative to health agencies, both farmers and townspeople are making a reasonable use of them. (Table 30).

6. While the health costs per farm family in South Dakota (Table 31), are slightly higher than in some of the eastern states, they are probably not greatly out of line with other comparative costs in the average family budget.

7. The writer cannot find anything inherently peculiar in the South Dakota rural health situation, excepting such problems as arise out of our geographical locations and economic limitations. On the other hand there are many compensating features as a relatively healthful climate and an unusually hardy homogeneous population stock.

8. There do not seem to be many serious rural health problems in South Dakota as contrasted with those of the towns, other than the problems arising out of a spatial handicap. It is noteworthy that the location of all health agencies are in villages, towns, or cities, thereby making them less accessible to the open country population.

9. Under our present type of rural social organization the most practical solution to the health problems of those counties without adequate health service, would seem to be:

a. A careful consideration of the full-time county health unit plan.

b. A careful consideration of a county hospital operating similarly to the one in Faulk county, or the guarantee of a fair share of the salary for a resident physician. This could be done through tax support, or through a voluntary health association.

In summarizing the survey as a whole,¹ the writer can do no better than to quote a part of the written report made to the Brookings County Health Association by Dr. Koenig after completing her work in April, 1930.

"The most prevalent defect noted was that of teeth, 1,940 of the number showing bad carious teeth and other accompanying conditions. Rachitic and ill formed jaws with crowded and marked irregularity of teeth; badly stained and unclean; inflamed, bleeding, sloughing gums; single and multiple gum abscesses; halitosis; 612 malocclusions, in many instances so pronounced as to cause facial deformity; 21 cases showed pyorrheic conditions. There was much premature loss of both deciduous and permanent teeth, the sixth year molar especially being lost through ignorance of its being a permanent tooth. It was the tooth found decayed most frequently. Three hundred and thirty-two children were found having sound teeth (no cavity or filling) and 638 were given

¹ This includes the additional 455 pupils ranging from 14-19 years of age. Because of this the order of prevalence in certain defects will differ slightly from the percentage as shown in Tables 35 and 36.

buttons for having perfect teeth, or for having their dental defects corrected. Forty-eight of the 332 children having sound teeth showed some slight imperfection. Over four hundred have correctible dental defects.

Next in order of frequency were the throat defects, 1,733 showing diseased, irritable, enlarged and ragged tonsils. Many embedded, regrowth or tonsillar tissue and 352 showed, in addition to the above, granulations of the throat. Much of this trouble can be attributed to the severity of the winter weather. Coated tongues were quite universal among the group.

Postural defects ranked third, 1,712 showing faulty postures in varying degrees, from beginning fatigue and slight protruding scapulae to badly rounded shoulders with accompanying protuberant abdomens, hollow and flat chest and in 14 instances rounded spines. Not many spinal curvatures were revealed.

CONTENTS

	Page
Part I—The New Health Era As Related to Rural Life in South Dakota	
Method of Study	4—8
Description of Area and People	8—15
Physical Features	8
Historical Background	8
Economic Status	8—11
Social Factors	11—14
Part II—General Facts About Health Agencies in South Dakota	
State Supervision of Public Health	15—18
Physicians and Dentists	18—20
Hospitals	20—24
Public Health Nursing	24—26
Part III—Health Conditions in Brookings County	
Sources and Routes of Infectious Diseases	27—29
Farm Sanitation	29—30
Home Conveniences	30—32
Food Habits of the Farm Family	32—38
Prevalence of Diseases and Disorders	38—42
Health Costs	42—51
Adequacy of Local Health Service	52
Physical defects of farm children	52—57
Summary and Conclusions	57—59