REGIONAL COPPER-NICKEL STUDY

HEALTH MANPOWER IN NORTHEAST MINNESOTA

Minnesota Environmental Qaulity Board
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TABLE OF CONTENTS

ABSTRACT

Northeast Minnesota has no obvious shortages of health professionals. In most cases, the proportion of health professionals in northeast Minnesota is similar to or less than that of the state as a whole. Comparisons with national rates show that northeast Minnesota has proportionally fewer physicians (although these proportions are probably typical of the national experience for counties of similar population), and proportionally more dentists and nurses. Although there are heavy concentrations of health professionals in Duluth, and to a lesser extent, Virginia, health professionals are well-distributed with regard to population throughout the region.

Public health services are well-developed in St. Louis County. The St. Louis County Health Department has a flexible structure which enables it to make rapid responses to the changing needs of its population. Public health services in the rest of the region are less comprehensive than those in St. Louis County, but have been stimulated by the Community Health Services Act, passed by the Legislature in 1976.

INTRODUCTION TO THE REGIONAL COPPER-NICKEL STUDY

The Regional Copper-Nickel Environmental Impact Study is a comprehensive examination of the potential cumulative environmental, social, and economic impacts of copper-nickel mineral development in northeastern Minnesota. This study is being conducted for the Minnesota Legislature and state Executive Branch agencies, under the direction of the Minnesota Environmental Quality Board (MEQB) and with the funding, review, and concurrence of the Legislative Commission on Minnesota Resources.

A region along the surface contact of the Duluth Complex in St. Louis and Lake counties in northeastern Minnesota contains a major domestic resource of copper-nickel sulfide mineralization. This region has been explored by several mineral resource development companies for more than twenty years, and recently two firms, AMAX and International Nickel Company, have considered commercial operations. These exploration and mine planning activities indicate the potential establishment of a new mining and processing industry in Minnesota. In addition, these activities indicate the need for a comprehensive environmental, social, and economic analysis by the state in order to consider the cumulative regional implications of this new industry and to provide adequate information for future state policy review and development. In January, 1976, the MEQB organized and initiated the Regional Copper-Nickel Study.

The major objectives of the Regional Copper-Nickel Study are: 1) to characterize the region in its pre-copper-nickel development state; 2) to identify and describe the probable technologies which may be used to exploit the mineral resource and to convert it into salable commodities; 3) to identify and assess the impacts of primary copper-nickel development and secondary regional growth; 4) to conceptualize alternative degrees of regional copper-nickel development; and 5) to assess the cumulative environmental, social, and economic impacts of such hypothetical developments. The Regional Study is a scientific information gathering and analysis effort and will not present subjective social judgements on whether, where, when, or how copper-nickel development should or should not proceed. In addition, the Study will not make or propose state policy pertaining to copper-nickel development.

The Minnesota Environmental Quality Board is a state agency responsible for the implementation of the Minnesota Environmental Policy Act and promotes cooperation between state agencies on environmental matters. The Regional Copper-Nickel Study is an ad hoc effort of the MEQB and future regulatory and site specific environmental impact studies will most likely be the responsibility of the Minnesota Department of Natural Resources and the Minnesota Pollution Control Agency.

INTRODUCTION

Availability of high quality medical care is generally believed to be a major determinant of the health of a population. Although this belief may be incorrect, the sick and injured should have high quality medical care readily accessible (Winkelstein and French, 1972).

Both the northeast region of Minnesota and the Regional Copper Nickel Study Area have characteristics that tend to attract health profesionals. Foremost among these characteristics is the existence of major urban centers -- Duluth, and to a lesser extent, Virginia and other cities on the Iron Range. Larger cities usually contain relatively more and wider variety of health professionals than the smaller cities and towns.

This report is an attempt to provide an understanding of the numbers and distribution of health manpower throughout the northeast region of Minnesota and the Copper-Nickel Study Area. Comparisons with similar data for the entire state are made when data permit.

NUMBERS AND LOCATION OF HEALTH MANPOWER

As a brief overview of health manpower, some general information for the seven counties is presented in Table 1.

Physicians

At the center of the health care system are physicians. It can be seen in Table 1 that the northeast region of the state has proportionately one-third fewer doctors than the state as a whole. Broken down by county, the proportion of physicians shows a very wide range from 0.25 per 1,000 in Aitkin County to 1.35 per 1,000 in St. Louis County. These findings are in accordance with national trends which show that as the size of a county increases, the proportion of doctors increases (Public Health Service, 1976). Comparable data for the United States as a whole were not readily available from the source listed for Table 1; however, in 1974, the United States had an average of 1.66 physicians per 1,000 population, compared to 1.67 per 1,000 population for Minnesota (United States Bureau of the Census, 1976). Because the trends in distribution of physicians are similar to those across the country, the availability of health care in northeast Minnesota is probably similar to the country, given the demographic characteristics of the region.

Figure 1 shows the distribution of physicians throughout the northeast region and the Study Area. It should be noted that the source of data for figure 1 (American Medical Association, 1973) is different than that for table 1 (U.S. Department of Health, Education, and Welfare, 1976). Although Duluth caontains almost two-thirds of the physicians, Figure 1 shows that the remaining physicians are well dispersed throughout the region with a secondary cluster along the Iron Range. Virginia contains over two-thirds of the physicians in the Study Area with the remainder dispersed throughout the area.

In addition to the numbers of physicians, the presence of specialists is also of interest. Table 2 shows the number of medical specialists certified as Diplomats by national specialty boards for the Study Area and each county in the northeast region. While almost all the specialty areas are represented in the northeast region, the vast majority of board-certified specialists are located in St. Louis County, and Duluth in particular (data for Duluth not shown). The Study Area has a wider variety of board-certified specialists than any of the counties outside of St. Louis, but not as wide a variety as Duluth.

Dentists

Dentists constitute a second major category of health professionals. All seven counties in northeast Minnesota had dentists in 1973 (Table 1). The variation in the proportion of dentists among counties, ranging from 0.33 per 1,000 population in Aitkin County to 0.76 in St. Louis County (Table 1), is much smaller than among physicians. Minnesota has about 20 percent more dentists proportionately than the United States' average (United States Bureau of the Census, 1976). Therefore, even though the northeast region has slightly fewer dentists than the rest of the state, it still has more than the national average.

Distrbution of dentists throughout the northeast region and the Study Area is shown in Figure 2. This diagram shows that dentists are well dispersed throughout both the northeast region in general and the Study Area, specifically. Again, a different source of information was used for Figure 2 (American Dental Association, 1975) than for Table 2 (U.S. Department of Health, Education, and Welfare, 1976), so the numbers may not be identical.

Nurses

Nurses are the largest category of health professionals. This category includes both registered nurses, who are responsible for the nature and quality of all nursing care that patients receive, and practical nurses, who provide care and treatment under the supervision of registered nurses. In this report only registered nurses will be discussed; data for other nurses were not readily available. Table 1 shows that there were 1405 registered nurses in the northeast region in 1972. This works out to 4.25 registered nurses per 1,000 population for the northeast region, ranging from 2.36 in Koochiching to 4.79 per 1,000 population in St. Louis County (Table 1). All figures are below the state average of 4.93 per 1,000. In 1972, Minnesota averaged more than 25 percent more nurses per 1,000 population than the Unites States average (United States Bureau of the Census, 1976). Hence, the northeast region as a whole had proportionately more nurses than the rest of the country.

Public Health Professionals

Public health services throughout the state have been experiencing some rapid changes in the past year because of the Community Health Services Act recently passed by the Minnesota Legislature. This law has provided a new source of funds to assist provision of public health services by

municipal and county governments. In this process, the counties have been responsible for preparing "Community Health Services Plans" in which local resources and needs are determined. St. Louis County has provided a major role in this process for northeast Minnesota by participating in two plans -- one for St. Louis County alone and one in combination with Carlton, Lake, and Cook counties to help coordinate community health services in the four counties. Aitkin, Itasca, and Koochiching Counties combined to form a community health services board and also prepared a joint plan. A summary of the public health personnel for the seven counties is presented in Table 3.

In 1976, the St. Louis County Health Department provided a wide range of public health services (St. Louis County Health Department, 1977). This department is divided into four divisions: Health Education, Public Health Nursing, Environmental Health, and Administration, all of which are directly under the Executive Officer. The following personnel were employed in each division: 2 in Health Education, 30 in Public Health Nursing, 26 in Environmental Health, and 20 in Administration. With the assistance of the Community Health Services Act and budgetary changes, total staff projected by the end of 1977 were: 11 in Health Education, 42 in Public Health Nursing, 27 in Environmental Health, and 27 in Administration. Program areas planned for 1977 in Health Education included: school health, venereal diseases, family planning, non-communicable disease control, environmental health, dental health, and public health nutrition. Public Health Nursing programs planned for 1977 included: maternal and child health, health services to parents during and after pregnancy, health services to high risk mothers and infants, early and periodic screening follow-up, school health, teen parents, home care,

itinerant clinics, mental health, tuberculosis, and communicable diseases. Environmental Health programs planned for 1977 included: food sanitation, boarding and lodging, clean indoor air, rodent control (phased out by June, 1977), sewage, solid waste, air pollution, water supply, housing, general sanitation, and swimming pools. The extent to which this plan has been implemented was not available at the time this report was prepared.

The St. Louis County Health Department has a flexible organization which enhances its ability to meet the changing needs of its population. Currently, central offices are located in Virginia and Duluth, and branch offices are located in Cook, Ely, Hibbing, and Meadowlands.

According to the four-county plan (Arrowhead Regional Development Commission, 1976 b), the following Public Health staffs existed in 1976: Carlton County had one Public Health Nursing Director, one Public Health Nurse, two Registered Nurses, 30 Home Health Aides and a half-time Zoning Administrator; Cook County had one Senior Public Health Nurse, two Homemaker I's, and a half-time Zoning Administrator; Lake County had two Senior Public Health Nurses, some part-time Home Health Aides, a one-third-time Zoning Administrator, a half-time Zoning Administrator Assistant, and a one-third-time Health Educator. Both Cook and Lake Counties had plans for hiring a sanitarian in 1977 to provide environmental health services.

According to the three-county plan (Arrowhead Regional Development Commission, 1976 a), the following public health staffs existed in 1976: Aitkin County had one Senior Public Health Nurse, 1.6 Public Health Nurses, a one-fifth-time Registered Nurse, some part-time Registered Nurses and Licensed Practical Nurses on an "as needed" basis, and a three-fourths-time Zoning Administrator;

Itasca County had one Senior Public Health Nurse, one Public Health Nurse, three Registered Nurses, some part-time Homemakers and Home Health Aides, one Zoning Administrator, and one Sanitarian; Koochiching County had one Senior Public Health Nurse, a three-fifths-time Registered Nurse, a one-fourth-time Zoning Administrator, and a three-fourths-time Sanitarian. However, in the descriptions of each county's public health programs, neither Itasca nor Koochiching Counties listed a Sanitarian and Itasca actually mentioned that they had no Sanitarian but intended to hire one in 1977.

Other Health Professionals

Numbers of pharmacists, occupational therapists, optometrists, podiatrists, chiropractors, and nursing home administrators are shown in Tables 1 and 4. For comparative purposes, the numbers of health professionals per 1,000 population have been calculated (Tables 1 and 4). In all cases, the northeast region as a whole has proportionately the same or fewer health professionals than the State as a whole. Data for pharmacists and optometrists are given twice because two different sources of data were readily available. Although not strictly comparable, the data give an indication of the variability in the number of optometrists and pharmacists.

DISCUSSION

Seven County Overview

Northeast Minnesota has no obvious shortages of health professionals. Comparisons of this region to the state and national experience may be used to help place the question of adequacy into perspective. In most cases, the proportion of health professionals in northeast Minnesota is similar to or

less than that of the state as a whole. Comparisons with national rates show that northeast Minnesota has proportionally fewer physicians (although these proportions are probably typical of national experience for counties of similar population), and proportionally more dentists and nurses.

Although there are heavy concentrations of physicians and dentists in Duluth, these health professionals appear to be well distributed with regard to population throughout the region. A wide variety of specialists practice in the region, with the vast majority in St. Louis County. Other health professionals are also well distributed throughout the region.

Public health manpower adequacy is even more difficult to assess. The Community Health Services Act, passed by the Minnesota Legislature in 1976, has stimulated development of public health services. Because this Act has been passed so recently, rapid changes in public health services are taking place, and as a result this paper has presented a conservative discussion of public health services in the region. In spite of these changes, the greatest numbers of public health personnel and variety of services are concentrated in St. Louis County, while some services are provided throughout the region.

Because health professionals are well distributed throughout the region, the population appears to have ready access to medical care for most of their needs. For more complicated health problems, a wide variety of specialists are available in Duluth and, to a lesser extent, Virginia.

Regional Copper-Nickel Study Area

Outside of the Duluth metropolitan area, the Iron Range has the largest number and variety of health professionals in northeast Minnesota. Virginia appears to be a center for health services, having more physicians, specialists, and dentists than any other city in northeastern Minnesota, except for Duluth.

In addition to the concentration of health professionals in Virginia, physicians and dentists are present in quite a few of the municipalities in the Copper-Nickel Study Area. Hency, health services appear to be available within short distances throughout the Study Area, including that part which is closest to the Duluth Gabbro Contact where additional people might be expected to settle if copper-nickel development occurs.

Quality of Data

It should be kept in mind that some of the data are almost five years old. Many changes could have occurred in that time to produce different results for 1977. It is therefore important to avoid placing too much significance in the actual numbers and rates, but rather to use data in a relative sense -- where are there concentrations of health manpower? how have the data for northeastern Minnesota compared with state and national data? what factors serve to maintain or change the status quo? In addition to the age of the data, one must keep in mind that undercounting and overcounting of health professionals were possibilities in all of the data collected.

Table 1

Numbers of Active Health Professionals in Northeast Minnesota, 1972-1974

Region	Dentists (1973)	Pharmacists (1974)	Occupational Therapists (1974)	Optometrists (1973)	Physicians* (1973)	Podiatrists (1974)	Registered Nurses (1972)
Aitkin	4(0.33)**	2(0.16)	1(0.08)	2(0.16)	3(0.25)	---	30(2.46)
Carlton	15(0.52)	14(0.49)	1(0.03)	1(0.03)	17(0.59)	---	112(3.91)
Cook	2(0.54)	3(0.81)	1(0.27)	-	3(0.81)	---	16(4.31)
Itasca	18(0.48)	16(0.43)	-	1(0.03)	25(0.67)	1(0.03)	123(3.31)
Koochiching	10(0.57)	8(0.46)	1(0.06)	1(0.06)	8(0.46)	---	41(2.36)
Lake	8(0.60)	5(0.38)	-	1(0.08)	9(0.67)	---	37(2.77)
St. Louis	166(0.76)	99(0.45)	21(0.10)	16(0.07)	294(1.35)	3(0.01)	1,046(4.79)
Total-Northeast	223(0.67)	147(0.44)	25(0.08)	22(0.07)	359(1.09)	4(0.01)	1,405(4.25)
Total-Minnesota	2,707(0.70)	1,960(0.50)	489(0.13)	337(0.09)	6,053(1.56)	69(0.02)	19,169(4.93)

* Includes M.D. and D.O.
** Numbers of active health professionals per 1,000 population, based upon 1973 estimates (U.S. Bureau of the Census, 1977).

SOURCE: United States Department of Health, Education, and Welfare (1976)

Table 2. Board-certified specialists in northeastern Minnesota 1976.

Region	Allergy and Immunology	Anesthesiology	Colon and Rectal Surgery	Dermatology	Family Practice	Internal Medicine	Neurological Surgery	Nuclear Medicine	Obstetrics and Gynecology	Opthamology	Orthopaedic Surgery	Otolaryngology	Pathology	Pediatrics	Physical Medicine and Rehabilitation	Plastic Surgery	Preventive Medicine	Psychiatry and Neurology	Radiology	Surgery	Thoracic Surgery	Urology	All Specialists
itkin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
arlton	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	3
ook	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
asca	-	-	-	-	3	1	-	-	-	1	-	-	1	-	-	-	-	1	2**	3	-	-	12**
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ake	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	5
t. Louis	-	9	-	4	8	29	3	1	9	10	9	7	13	9	-	-	2	7	17	22	2	6	167
otal-tudy Area	-	-	-	2	4	5	-	1	3	2	2	-	2	-	-	-	-	1	3	5	-	1	31
otal-ortheast	-	9	-	4	18	31	3	1	9	11	9	7	14	9	-	-	2	8	19	27	2	6	189

*Does not include specialists listed in the supplemental list; hence, these numbers may be slightly low.
**One specialist splits his time between Grand Rapids and International Falls.

OURCE: Marquis Who's Who (1976)

Table 3.

Selected Public Health Personnel - 1976

	Personal Health				
	Nurses (P.H.N., R.N., L.P.N.)	Other*	Health Education	Environmental Health	
				Sanitarians	Other**
Aitkin	2.8+				0.75
Carlton	4	30			0.5
Cook	1	2			0.5
Itasca	5	some			1
Koochiching	1.6				0.25
Lake	2	some	0.33		0.83
St. Louis	30		2	23	3

*Home Health Aides, Homemakers
**Zoning Administrators, laboratory personnel (in St. Louis County)

NOTE: These numbers have probably shown some substantial changes because of the Community Health Services Act (see text).

SOURCES: Arrowhead Regional Development Commission (1976 a,b); St. Louis County Health Department (1977).

Table 4.

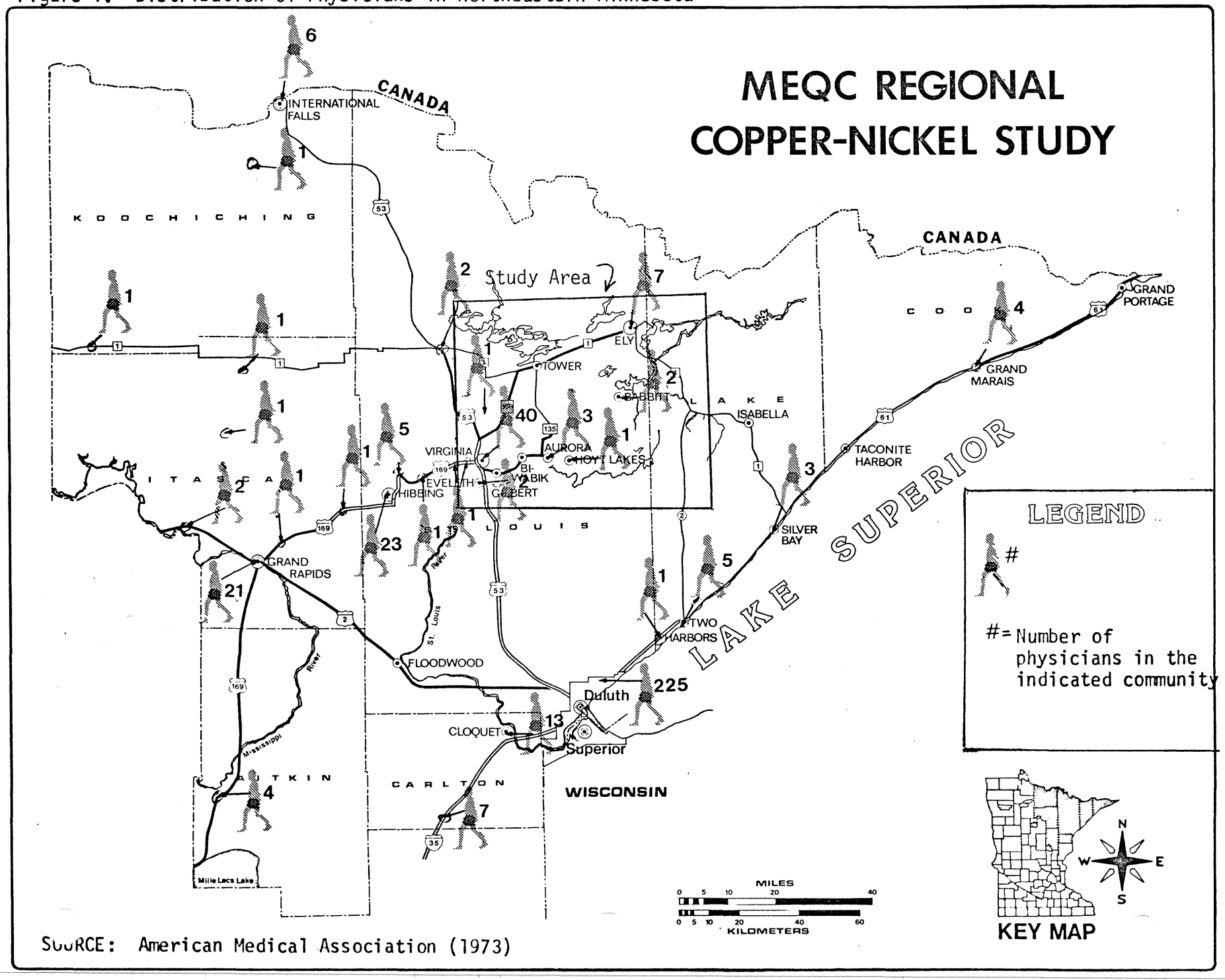
Numbers of Active Health Professionals in Northeast Minnesota, 1976

	Pharmacists (1976)	Optometrists (1976)	Chiropractors (1976)	Nursing Home Administrators (1976)
Aitkin	5(0.40)*	1(0.08)	2(0.16)	2(0.16)
Carlton	13(0.45)	3(0.10)	4(0.14)	5(0.17)
Cook	1(0.27)	-	-	-
Itasca	19(0.49)	4(0.10)	3(0.08)	3(0.08)
Koochiching	8(0.45)	2(0.11)	1(0.06)	2(0.11)
Lake	4(0.29)	-	1(0.07)	1(0.07)
St. Louis	118(0.55)	17(0.08)	23(0.11)	12(0.06)
Total-Northeast	168(0.51)	27(0.08)	34(0.10)	25(0.08)
Total-Minnesota	2,195(0.56)	309(0.08)	388(0.10)	462(0.12)

* Numbers of active health professionals per 1,000 population, based upon 1975 population estimates (U.S. Bureau of the Census, 1977).

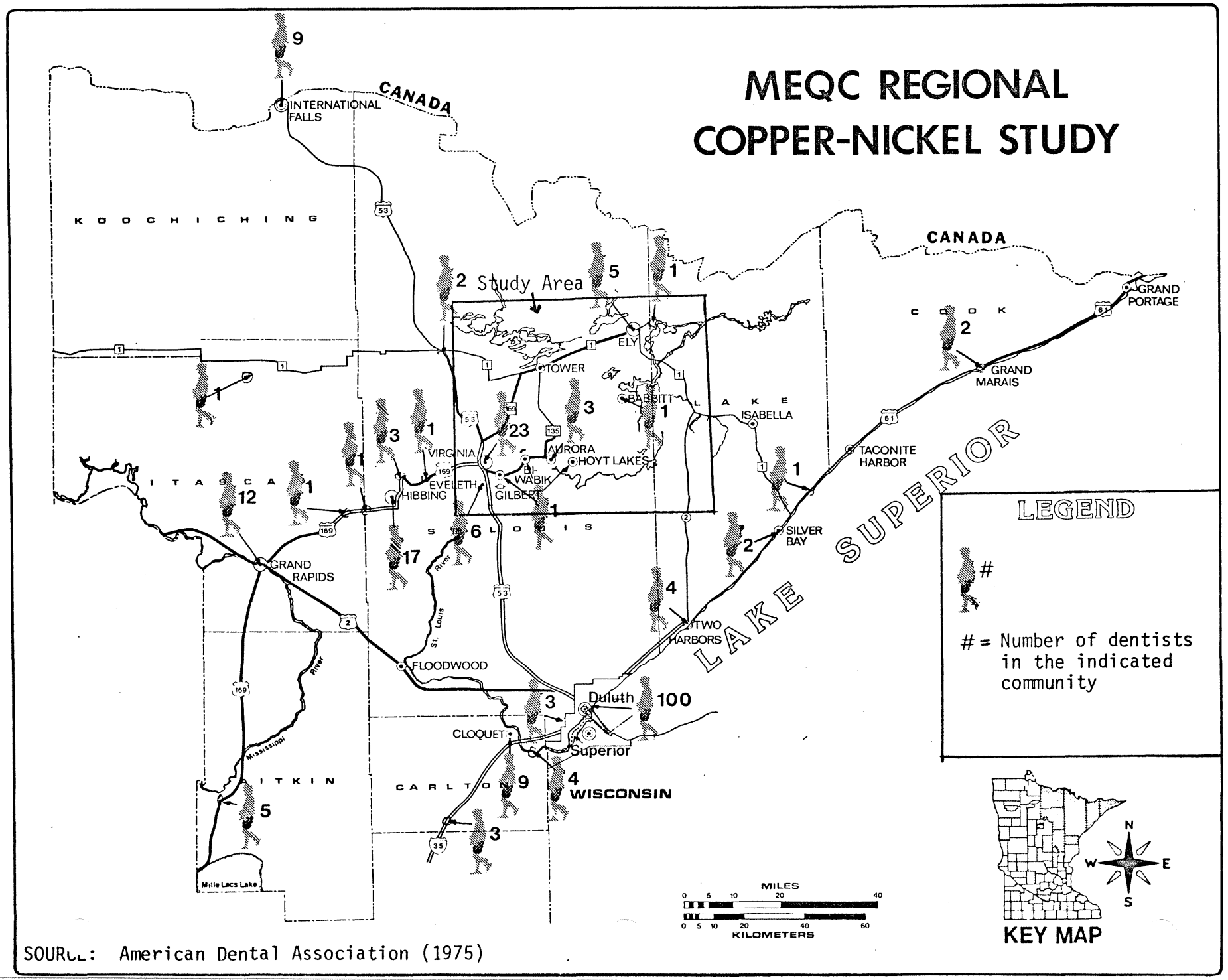
SOURCE: Minnesota Department of Health (1977).

Figure 1. Distribution of Physicians in Northeastern Minnesota



SOURCE: American Medical Association (1973)

Figure 2. Distribution of dentists in northeastern Minnesota.



SOURCE: American Dental Association (1975)

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