A Data Bank for Patient Care, Curriculum, and Research in Family Practice: 526,196 Patient Problems

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The health care problems that 88,000 patients presented to 118 family physicians over two years were evaluated. As a result, 526,196 health care problems were noted. Ninety percent of all problems were contained within 169 descriptive problems using the RCGP coding system for primary care. Knowledge of the profile of patient problems as they present to the family physician will allow for the development of a logical curriculum for the family practice resident and of patient care systems in family medicine. An appropriate methodology for the development of curriculum is discussed.

The Millis Report has stated that health care systems need to be developed to meet the general medical needs of the people.[1] Health care should not be confused with medical cure. Hospitals have established very complex medical cure systems during the past 30 years in conjunction with medical schools. However, during the same interval, a comparable growth in primary health care systems has not been noted.[2]

Family practice is a young medical specialty steeped in the proud traditions of general practice.[3] Primary health care delivery is the major responsibility of family medicine. To assume its rightful position among the other specialties in medicine, family practice must be subjected to the rigors of the scientific method.

To date, family practice has been defined as a discipline with great horizontal dimension and small vertical one.[4] A few studies have looked at this horizontal dimension, but only in relation to a single practice[5-7] or a review in a finite period of time.[8,9] This article will define the horizontal dimension of family practice (the numbers and kinds of health care problems that are evaluated by the family physician), show that there is a substantial vertical component (the detailed definition of descriptive diagnosis through a continuum of time) in this horizontal dimension, and suggest a rational methodology for developing curriculum and patient care systems in family practice.

Methodology

From July 1, 1973, to August 1, 1975, 82 family practice residents and 36 practicing family physicians recorded all patient problems evaluated during each 24-hour period onto a daily work sheet (Figure 1). Table 1 shows the distribution of the physician sample by population of practice community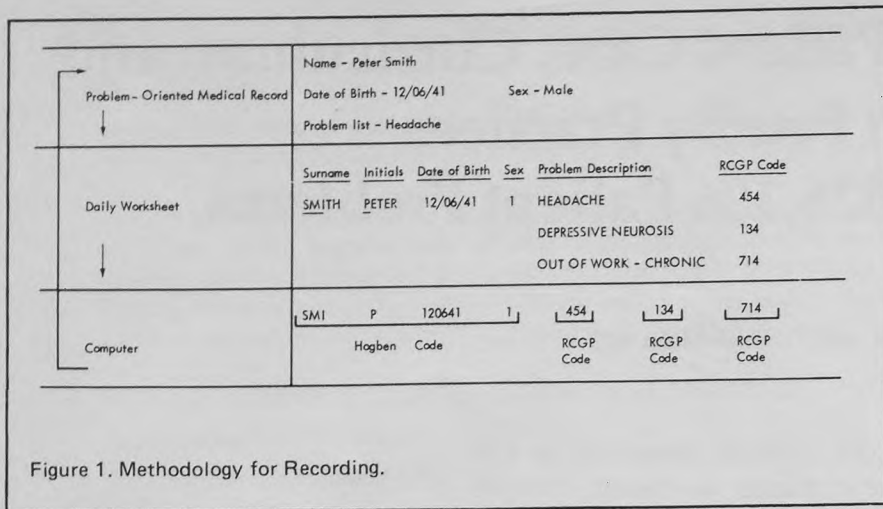: 31 rural, 39 suburban, and 48 urban. Approximately 88,000 patients or 2.3 percent of the population of Virginia were served by these physicians. Figure 2 shows the distribution of the physicians and the model units within Virginia.

The daily work sheet was basically an appointment list turned into a data input sheet for key-punching, the information then being stored and correlated in a computer.[10,11] The secretary in the practice would record the patient's name, date of birth, and sex on the work sheet. After evaluating the patient, the physician would record the problem or problems that were addressed. The secretary would then code the problems recorded on the daily work sheet using the USA Modification of the Coded Classification of Disease of the British Royal College of General Practitioners.[12] The classification is composed of 22 diagnostic categories con-

Table 1. Distribution of Physician Sample by Population of Practice Community

	Rural (pop: 4,999 or less)	Suburban (between 5,000- 99,000)	Urban (more than 100,000)	Total
Practicing Family Physicians	13	11	12	36
Family Practice Residents	18	28	36	82
				118

Figure 1. Methodology for Recording.

Figure 2. Distribution of Physicians and Teaching Practices.

Figure 3. Content by Diagnostic Category, teaching vs non-teaching practices

taining 607 problem categories. The individual patient was identified using the Hogben Code.[13] Average physician time per day for recording was about ten minutes, and average secretarial time was about 30 minutes. A validity check on 1,000 random charts to determine the error in recording between the patient's record problem list and information stored in the computer was done. New and old problems and follow-up visits were combined for this study.

Results

Recorded during this 25-month interval were 526,196 primary health care problems for all age groups combined, from one week of age on. The problems were arranged into 22 major diagnostic categories. Teaching and non-teaching practices were compared (Figure 3). The profiles were remarkably similar. The suburban, urban, and rural practices were compared (Figure 4). These profiles were also remarkably similar, except for a greater frequency of trauma and problems of the respiratory system in rural practice. Figure 5 describes the population profile by age and sex comparing the State of Virginia with the teaching practices. The profile of the population in the teaching practices is parallel to the population profile for the State of Virginia.

The data bank is arranged into two formats. The first part is diagnoses ranked by frequency to the 99th percentile. The second part is diagnoses ranked by frequency in each of the 22 major disease categories. Within each major disease category the data is further subdivided into the age groups of 1 week (0) to 4, 5 to 9, 10 to 14, 15 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64, 65+ years. The age groups are further divided into male and female. The 50th percentile of all 526,196 problems was contained in 23 descriptive diagnoses; the 70th percentile was contained in 63 descriptive diagnoses; the 80th percentile was contained in 102 descriptive diagnoses; and the 95th percentile was contained in 234 descriptive diagnoses.

A four percent recording error was noted between the patient's record problem list, the daily work sheet, and information stored in the computer.

Within the confines of this paper it would be impossible to comment on
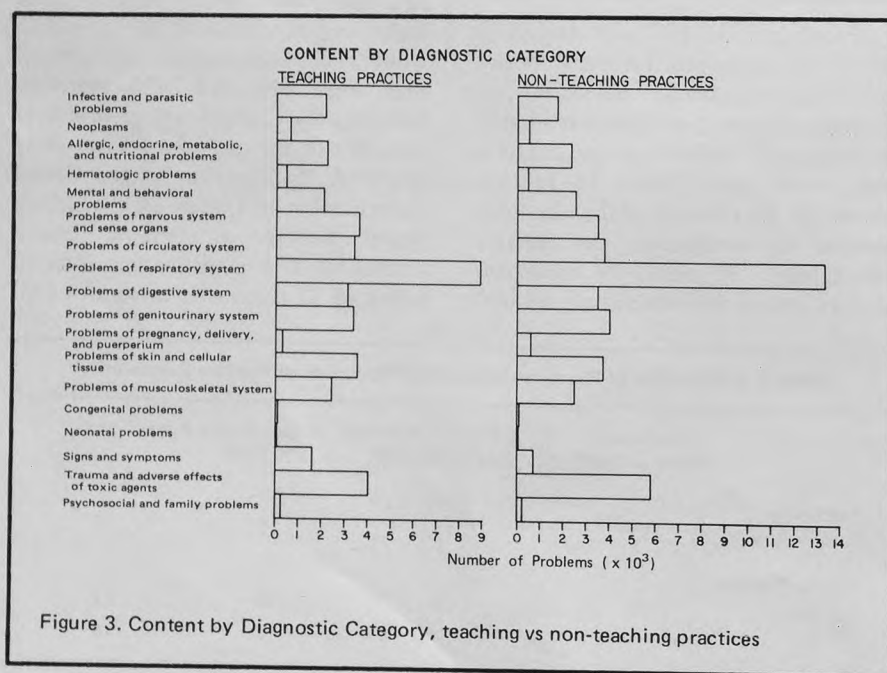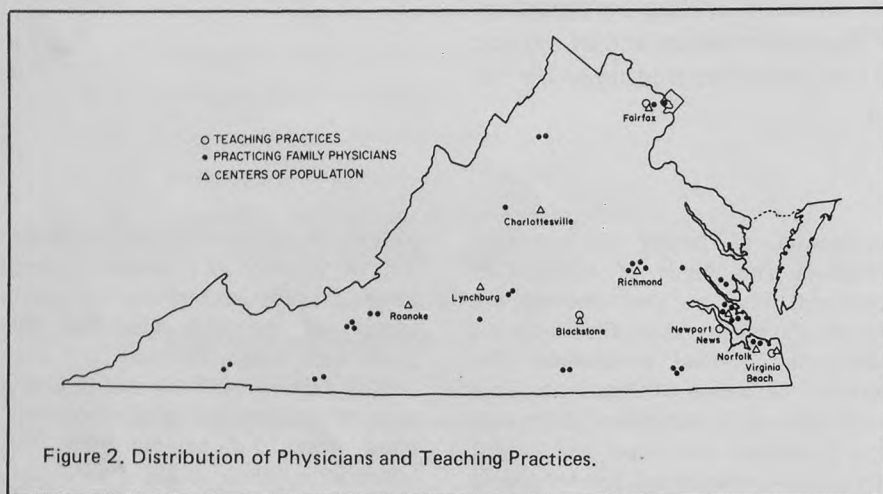
all of the data contained within the data bank. Four examples are cited:

RCGP Code number 4 is gonorrhea and is contained within diagnostic category 1, communicable diseases. There were 1,249 episodes of diagnosis with a frequency distribution that would be expected for gonorrhea peaking from age 15 to 34. Four of the cases that occurred from age zero to four were in the neonatal period. One case was a three-year-old that was sexually molested. The cases in the five to nine age group all occurred at age nine, all having been sexually molested. Therefore, all of these cases occurring in the younger age groups were real cases presenting an interesting profile. The methodology of resourcing the records for research and curriculum is described in the discussion.

RCGP Code number 218 is benign or unspecified hypertension and is contained within diagnosis category 7, diseases of the circulatory system. There were 30,235 episodes of diagnosis with a frequency distribution which increased with age. The cases that occurred from one week to 14 years totaled 129. Within these practices, blood pressure in children was carefully recorded. This population of children is under study.

RCGP Code number 9 is meningococcal infections, occurring within diagnosis category 1, communicable diseases. Fifteen episodes of meningococcal infections occurred in two years. From this we estimate that the family physician would evaluate one case of meningococcal infection every two to three years.

RCGP Code number 217 is the general category, other heart disease, contained within diagnosis category 7, diseases of the circulatory system. The content of this category after record review was 96 percent functional heart murmur. Coding revisions should contain the category functional heart murmur.

Discussion

The data presented in this paper represent the gamut of health care problems evaluated by the family physician during the day in the office, the hospital, the nursing home, and in the patient's home. Profiles comparing diagnostic categories were remarkably similar for teaching and non-teaching practices, and the suburban, urban,
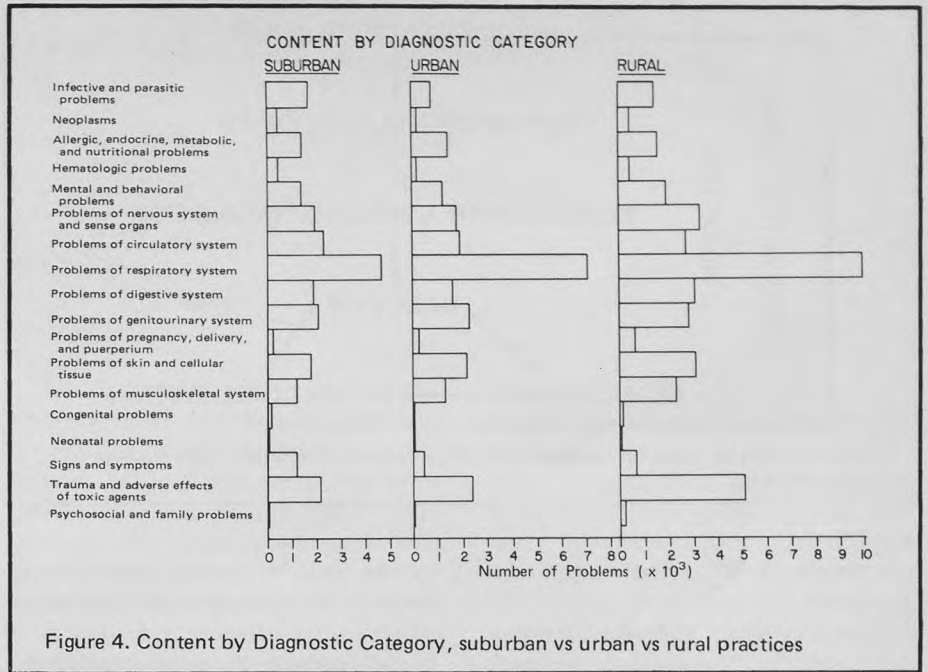
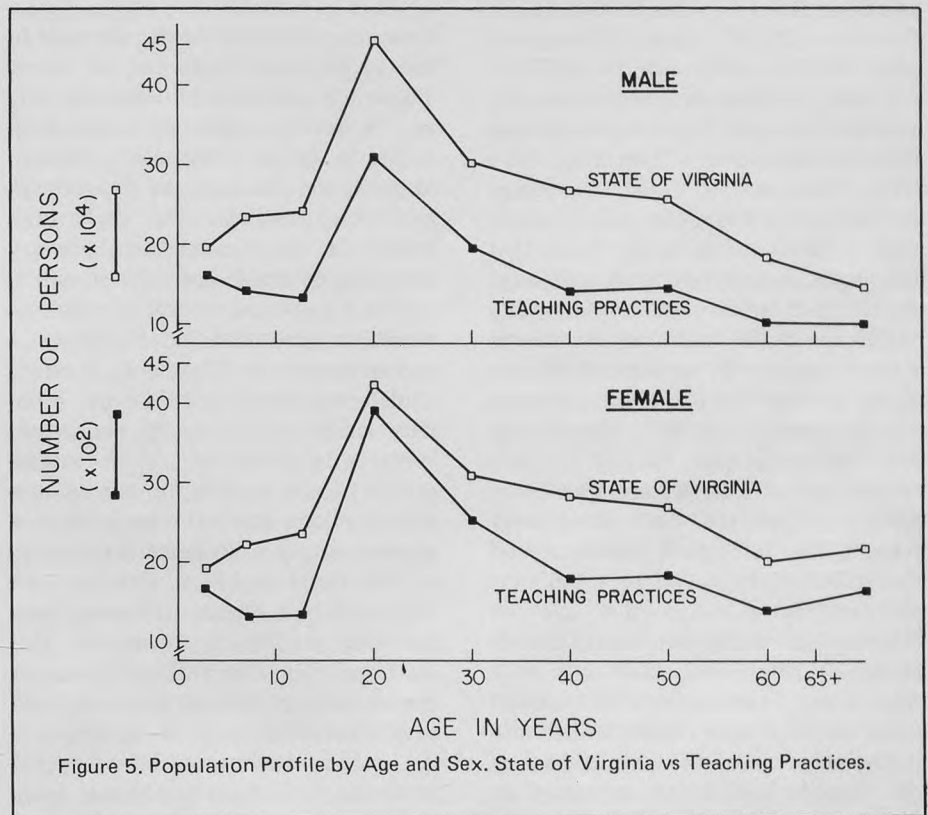Figure 4. Content by Diagnostic Category, suburban vs urban vs rural practices

Figure 5. Population Profile by Age and Sex. State of Virginia vs Teaching Practices.

and rural practices. The assumption is made that the residents are practicing in a patient population similar to that of the practicing family physician. The assumption is also made that the residents are practicing in patient populations that will also be appropriate for suburban, urban, and rural practice. The age and sex distribution for the teaching practice was comparable to the distribution for the State of Virginia. The profile substantiates the impression that the

teaching practice population is a representative sample.

Within the horizontal dimension (all problems combined) of the family physician's workday, 80 percent of all problems were contained within 102 descriptive diagnoses. Many descriptive diagnoses occurred very commonly; in fact, 23 descriptive diagnoses represented the 50th percentile of all primary health care problems! The vertical component of family medicine is to be defined by careful evaluation
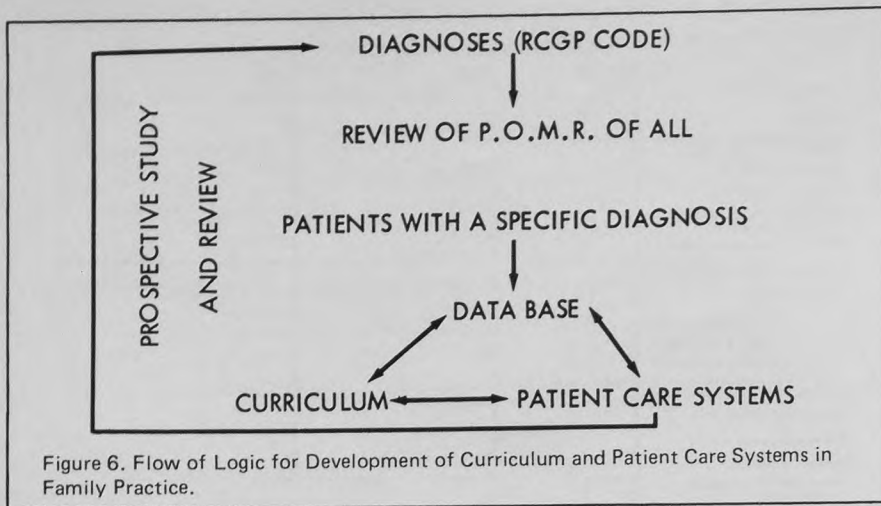
Figure 6. Flow of Logic for Development of Curriculum and Patient Care Systems in Family Practice.

of these common descriptive diagnoses (Figure 6).

It is possible to have the computer print out the Hogben Code for each patient within a common descriptive diagnosis (RCGP Code). The physician can then review all the problem-oriented medical records within his practice or many practices combined, thus accumulating a data base. This data base can be used to design curriculum and patient care systems. This logic is no different from that classically employed by investigators within a hospital milieu. The only difference is the fact that the investigator is looking in an ordered manner at the natural first-line presentation of disease as it occurs within the family practitioner's office.

A major criticism of any descriptive study is that the description only reflects the individual experience of the recorder. It is also accepted that any system such as this can be criticized as being too restrictive in scope, as being concerned only with that which is recognized and understood and not with the ill-defined and unknown areas of the natural history of patient disease as it exists in community practice. This is the most exciting and potentially productive area of future investigation in family medicine, and the work-sheet methodology used in this study was developed for the express purpose of such investigation. Using the data abstracted from clinical and demographic records of patient problems or problem complexes, hypotheses can be developed and prospective studies of any duration instituted, to confirm or deny these hypotheses. Such studies will at least produce new data which

can be used to develop further hypotheses in the classical scientific method of:

$$Data \rightarrow Hypotheses \rightarrow Experiment \rightarrow Observation$$

Using the RCGP Code as a signpost to the problem-oriented medical record allows the physician to look critically at his practice through longitudinal audit, to design prospective plans to improve patient care, to expand the available medical and behavioral knowledge as it applies to primary care, and to design logical curriculum.

The number of recorded behavioral problems presented in this study is approximately 6.7 percent. Previous studies indicate that behavioral problems comprise 20 to 30 percent of community practice.[14,15] A careful search of the records for one descriptive problem, low back pain, showed approximately a 30 percent recording of behavioral problems. However, the behavioral problems had not been recorded on the problem list. This light recording also perhaps represents the underemphasis on behavioral science curriculum in medical school, a less than optimal taxonomy for recording behavioral problems, inappropriate methodology for teaching behavioral problems at the residency level, and/or problems with confidentiality. A recording system and curriculum for behavioral problems need to be developed for family medicine.

By recognizing which disease entities are most common in the family practitioner's office, the intent is not to disregard the less common, life-threatening diseases. A major portion of the family medicine curriculum should be directed toward emergency medicine and serious or life-threatening

problems. The family practitioner should be adept in the prevention and management of these problems. Management would include appropriate initial therapy for stabilization of serious problems, with prompt referral to the appropriate specialist when indicated. In rural practice, the logistics may be somewhat different.

In conclusion, this methodology for indexing the problem-oriented record allows the physician to know the patients by diagnosis within his practice.[10,11] This individual practice information could serve as a focal point for longitudinal audit, board recertification, and continuing education within the discipline of family practice. The larger comprehensive profile of family practice contained within the data bank could serve as a reference point for future prospective studies that would lead to the development of curriculum and patient care systems and new understanding of the natural presentation of disease in the community.

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