A MICROCOMPUTER BASED COMMUNITY HEALTH NURSING DATABASE MANAGEMENT SYSTEM

Samuel Schultz II, Ph.D.
Professor and
Director of Computing Facilities
Mary L. McHugh, R.N., M.S.N.
Doctoral Candidate
University of Michigan
School of Nursing

It has become more and more important for community health nursing supervisors and administrators to document the quality and quantity of care delivered by community health agencies. Clearly, there exists a need for a community health nursing management information system (CHN-MIS). Such a system should provide a comprehensive database management system (DBMS) for rapid and cost/effective storage and retrieval of critical information regarding the delivery of care in community health agencies. A system which provides timely and clear management information is critical for both the planning and evaluation of care delivery, especially in a multi-agency multigovernment environment.

Part and parcel of a good CHN-MIS is a good system for managing both caseloads and workloads of the agency staff. The increasing needs to meet standards placed upon delivery systems by agencies of all kinds, from local to national governmental and private reimbursement agencies, as well as by professional organizations (e.g., NLN and ANA), require a responsive system to meet this continuing demand for specific reporting information. Finally, the need to execute consistent staffing policies, maintain staff morale, provide regular productivity reports, manage complex budgets, turnover, and monitor the quality of care, all demand an integrated computer based DBMS approach to CHN-MIS needs.

Unfortunately, there currently exists both a lack of well designed comprehensive systems for CHN-MIS's as well as typically minimal resources for implementing such usually costly systems in most community health nursing agencies. For example, the VNA of Omaha offers an RPG-based system on IBM minicomputer hardware. Not only does the system require initial expenditures in the neighborhood of $50,000 for hardware and software (although remote access services can be purchased) the system is primarily a report generator/formatter and provides minimal analysis for predictive staffing based upon current caseloads and workload demands. However, because of the significant report generation unburdening of the administrator of a typical community health nursing agency by this system, it is well received both in spite of its high costs and limited scope. As Saba (1982) points out, most available systems are:

"(1) financial or billing; (2) statistical; or (3) systems with some patient care information" (p. 148, SCAMC-6).

As Saba (ibid) further points out, only PCIS of the Indian Health Service, COSTAR and the Omaha VNA systems seem to be able to manage client information. It is certainly not clear that any of these three systems are either cheap enough or effective enough to link client needs with staffing needs for the average small to medium sized community health nursing agency. The purpose of the system described here, Caseload/Workload Planner, is to meet the needs cited, for a low cost responsive system for planning caseloads and workloads in small and medium community health agencies.

Using a successful paper based instrument as a basis, the current system was programmed in Basic (approximately 1000 lines) on an Apple II microcomputer with 48k RAM, one disk drive, a Bright Pen intelligent light pen by Softape, and an Epson MX-80 dot matrix printer; all together this represents approximately $2500 of hardware. The paper based instrument (Easley, Allen and Storfjell, 1980) represents a carefully constructed instrument for first measuring basic parameters of a community health caseworker's job classification and educational background, second a careful analysis of the current caseload and third, a detailed analysis of the general workload of a staff member. As a paper instrument, the process can be tedious and thus lead to dissatisfaction with the instrument. It was felt by the current authors that by using a rapid, frame-oriented, light-pen-driver system, case workers could rapidly proceed through the system to enter case and work related data, and that supervisors and administrators could also easily retrieve and analyze the data.

The first phase of this project then consisted of redesigning the paper based instrument for the above described microcomputer environment for a light-pen frame oriented input to a DBMS. After introductory frames (using the Apple II text screen mode) teaching naive users how to use the light pen and the system, the program requests basic data regarding the job title, professional and education background, type of cases and case...
assignment category of the staff member. The system then proceeds to assess all of the cases of the caseworker using a 4x4 system designed by Easley, Allen and Storfjell, based upon:

1. Time required (from monthly to daily) in 4 ordinal categories and
2. Level of service based upon four ordinal categories for each of 6 dimensions of service: (a) clinical judgment, (b) teaching needs, (c) physical care, (d) psychosocial care, (e) multiagency involvement and (f) number and severity of problems. Caseworkers then classify each case based upon the 4x4 matrix. After initial learning, caseworkers can proceed rapidly through cases, usually less than 1 minute each. The system then calculates expected work time demands (e.g., home visits required per month) based upon an internal algorithm which links the two dimensional assessment to expected workload.

Although any number of valid algorithms, statistically based or empirically based, could have been used, this empirical one was used because it appeared to work well in the settings for which it was designed. This is based upon the research of Easley, Allen and Storfjell (1980) and current work is underway to test reliability and validity of the algorithm. Out of this assessment process then, any aggregate of caseloads by time, difficulty level or home visits required can be easily accessed by administrators in order to do case assignment, evaluation, workload planning, etc.

The third and final step of the program is to assess all of the remaining parts of workload, not directly linked to case complexity or time demands. Such things as mileage, hours spent in conferences, inservice education, community teaching, staff development, record review, etc. are appraised. All of this data, periodically updated, serves then as a database for convenient review by administrators and supervisors to analyze and plan workloads in accordance with agency demands and procedures.

The system then takes all three sources of data and allows users to represent them in multiple tabular and graphical forms for analyses and review. Printing any graph or table is at the option of the user, although as a general DBMS the focus is not upon report generation and printing as in the Omaha VNA system. This system is truly interactive, allows ad hoc queries and is not a remote batch system.

The second and current phase of development of this system is to link the Workload/Caseload Planner output to Dbase II, a fully relational CP/M based DBMS and to prepare the system for a multiuser operating system to allow simultaneous use by several caseworkers, administrators, etc. This work is currently in progress and our expectation is to have a phase II prototype ready by the end of the 4th quarter of 1983.

References


Saba, V.K. Computerized Management Information System in Community Health Nursing, Proceedings of The Sixth Annual Symposium on Computer Applications in Medical Care, 1982, Washington, D.C.