

*Described as a valuable administrative tool, a system of gathering statistics on health services is outlined in relation to health department programs.*

# Health Service Statistics Record System

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**H**EALTH departments are constantly coping with the problems of insufficient money and people to carry on their present programs; at the same time, the rapidly growing population is making demands for new and increased health services. Facts concerning past and present services to the current programs are sorely needed as a means of evaluating past services, redesigning current operations, and determining priorities for the future. How can we obtain these facts in a simple manner?

Most public health workers are already overburdened with recordkeeping, and we need to be very cautious about adding to this load. However, many of the present recordkeeping systems are designed to provide specific information regarding a certain program without thought of relating it to other information concerning the same program or to other programs.

The scope of public health services is continually broadening, and more and more disciplines are represented on the staffs of health departments. The result is that no one program is conducted solely by one organizational unit of the department, but rather through the co-

operative effort of many disciplines from several program units. For example, usually the tuberculosis services of a health department include the work of not only the tuberculosis division but also other divisions such as nursing, nutrition, education, social service, and environmental health. This interdependence of disciplines is increasing rather than decreasing, and as it increases so will the need increase for interrelated statistics. To collect service statistics from several units concerning a single program is both a necessity and a problem.

For some time, statisticians of the Michigan Department of Health had been disturbed by the lack of service statistics compiled by program and had recognized a need for a system to provide these data on a departmentwide basis regardless of organizational units. A new system began in the Michigan Department of Health the day the chief of the nutrition section came to the statistical methods section for help with the reporting system for her section. She commented that the daily reports were time consuming to tabulate, and once counted had little meaning for they could not be related to each other and, consequently, were of little value for program planning or evaluation. The nutrition section seemed a logical unit for a pilot study in the use of a new system. There were only five members on the staff, and they

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were carrying on a type of program which provided service to practically all other major health department programs.

### Basic Record

The first step toward establishing the new system was to determine the type of basic record to be used. It was recognized that it must be a simple one in order to obtain complete and accurate reporting. This, together with the availability of IBM tabulating equipment in the department, resulted in the selection of the IBM mark sense card, designed to be used as the basic record for collecting and tabulating the data (fig. 1).

The fieldworker carries with him a small supply of these cards and a special IBM electrographic pencil. He records the services he gives by means of a few pencil marks on these cards; one card is used per activity according to the codes, all of which are indicated on the front or back of the cards with the exception of the geographic area code. Thus, only one code needs to be carried by the worker and since many workers provide services within limited geographic areas, they soon become familiar with their individual area code numbers. The completed cards are transmitted to the statistical methods section where they are mechanically punched in preparation for the required tabulations. Because mark sense cards are punched mechanically, their use eliminates the process of manual punching which would be required if any other type of record were used. However, where the volume of cards is small and IBM equipment is not available, the system is well suited to a marginal punchcard.

### Information Recorded

This card provides for the recording of the following kinds of descriptive and identifying data concerning services:

*Health department program* (columns 25-27). Service consultants frequently provide services to more than one program during a single conference or other activity. For that reason, three identical program columns have been provided allowing for the recording of as many as three different programs served

during any one activity. For example, an individual conference is held with one person during which maternity, child health, and chronic disease problems are discussed. In this instance, the one person receiving service would be recorded as one in the "number in attendance" columns. In the program columns, all three programs are indicated; maternity would be marked in one program column, child health in the second, and chronic diseases in the third. However, there is no significance to the sequence of the three program columns; the marking of these three programs in any other sequence would be equally acceptable.

This method of recording makes it possible to obtain two types of counts; a count of total persons served without regard to programs and a count of persons served in each program. Machine tabulating procedures make it possible to count this person once in each of the three program columns and once in the total column (table 1). In other words, the total column refers to total persons served, some of whom may have been served in more than one program. Because a recipient frequently receives service related to more than one program, the sum of the persons served in each of the programs is usually greater than the total number of persons served. From these two types of counts, it is possible to obtain valid percentage distributions of services by program (table 4).

*The geographic area* (columns 19-21). The geographic code refers to the location of the recipient of the service. It identifies the following: individual counties, a few special cities, regions of the State, the State at large, the United States other than Michigan, and foreign countries.

*The agency* (column 18). Agencies with which the recipient of the service is associated are identified according to the local health department, hospital, private organizations, and other State agencies.

*Personnel category* (columns 16, 17). To record the work of the recipients, certain categories of personnel are identified by the code on the back of the card. Additions have been made as new programs have been included in the system.



However, some of the programs have certain types of services peculiar to their own programs which they also wish tabulated. We have reserved space for recording these items for the respective programs. One column is now used for special casefinding activities in the hearing program, and for special chronic disease information for nutrition and nursing. Other columns are used for hospital identification for the hospital consultation and the licensing section. This type of arrangement makes for uniformity, yet it is flexible enough to accommodate special program needs.

### **Purpose, Objective, and Philosophy**

The purpose of this record system is to provide a feasible method of collecting these service statistics and a flexible means of tabulating them. The objective is to provide meaningful service statistics for program planning, administration, and evaluation which will be useful to the individual worker, the program director, and the administrator.

The system is primarily concerned with the recipients of health department services, the number of Michigan people and others who received service from the professional fieldworkers of the Michigan Department of Health. The number of recipients is a count of persons to whom services have been given and is not necessarily an unduplicated count of individuals. The item of activity as used here serves to indicate the method or means through which these services are accomplished. A count of these activities is not for the purpose of determining the amount of effort put into the job by each worker; instead, it is a means by which the amount of services accomplished can be related to the various work techniques, individual and group.

Only activities which provide services are reported in this system. For example, attending a professional meeting without participating is not recorded because no service was given. However, if there was participation in the meeting, then a service was given and the activity is recorded together with the number of people receiving the service. The first instance is for professional advancement while the second is a service given. Likewise, interdepartmental

planning conferences are not recorded; it is a foregone conclusion that effective services cannot be provided without previous planning and counseling. Also the time spent providing these services is of no concern in this system. When the time element is important, it can be considered more appropriately through special time studies.

### **Development**

To establish the new system required several planning sessions over a period of time. In the beginning, several conferences were held between the chiefs of the nutrition section and the statistical methods section to determine types of data needed and the uses to be made of them. The statisticians met with the entire nutrition staff for an explanation of the philosophy and method of the new system. The staff assisted in defining terms and establishing rules for recording. Following this, the system was put into use. At the end of the first month, sample tabulations were run and summary tables prepared. These were jointly reviewed by the nutrition staff and the statisticians at the monthly nutrition staff meeting to which the director of the division of local health services and the director of the division of administration were invited.

Throughout the year, monthly tabulations were reviewed jointly with the nutrition staff at their monthly staff meetings. This continuing process provided a means of refining definitions and policies and developed a common understanding of the philosophy, problems, and methods of recording. At the end of the year, annual tabulations and summaries were prepared. Also, a few graphs were prepared showing the percentage distribution of nutrition services by program and by agency. This was the first time annual service statistics had been available on either a program or agency basis.

Again the directors of local health services and administration were invited for the review and expressed considerable interest in the value of these statistics to the department as a whole. The director of local health services said that the actual figure of total people served together with the subdivisions by program would be

useful in verifying the fact that the State health department had rendered specific services to certain individual health departments. The director of the division of administration felt that the figures by program would be useful in justifying categorical funds and helpful in making a more equitable distribution of them among the organizational units of the department.

At the end of the second year, annual summaries and charts were again reviewed. This time the charts were designed to compare the 2 years, keeping in mind, of course, the changes in size of staff. At the end of the third year, it was possible to prepare charts in the form of line graphs indicating trends and summary tables in the form of time series. At this point, it became possible to take a new look at the program from the standpoint of both the past and the future—in other words, to evaluate what had been done and set goals for the future. With 3 years' accumulation of data, the system took on new meaning and value for the program people.

During this period of development in the nutrition section, the director of the maternal and child health division suggested that this system be applied to some of her programs where a rather extensive code system of reporting was being used. Also, during this time, the system was reviewed by the Research and

Statistics Committee of the department composed of representatives of most of the health department programs. The representatives from local health services and administration were already familiar with its advantages and were helpful in conveying to the other members of the committee the advantages of the system to the department. The committee, including the director of the maternal and child health division, recommended that the system be extended to other organizational units. The director also suggested that the extension begin with three of her programs—hearing, vision, and hospital services. The statisticians then held meetings with the director of the maternal and child health division, her section chiefs, and staff members of these program units; these meetings were similar to those held with the nutrition section.

Not long after the system was underway in these programs, the chief of the nursing section requested that her program be considered next. Similar procedures of indoctrination were carried out with this section. Basically, the definitions and terms used for nutrition were acceptable to the other programs but needed to be related to the specific programs. It was obvious that the preliminary conferences and meetings with the nutrition staff were paying dividends. Relatively few changes have been necessary in the nutrition definitions and

**Table 1. Report of nutrition services by agency and program, Michigan Department of Health, 1958**

Agency	People served by program								
	Total	Communicable disease	Maternity	Child health	Tuberculosis	Chronic disease	Dentistry	Environmental health	General
Total.....	11, 448	11	1, 550	5, 743	122	4, 250	142	48	2, 702
X Multiple agencies.....	24	0	0	24	14	24	10	0	0
0 Local health department.....	2, 043	4	211	837	58	1, 143	65	46	590
1 Hospital.....	962	0	252	141	25	220	0	0	597
2 Institution.....	656	0	0	208	0	474	0	0	226
3 Grade school.....	2, 918	0	2	2, 837	1	109	49	0	154
4 College.....	503	0	82	207	2	235	0	1	407
5 Welfare agency.....	178	0	5	88	1	93	0	0	12
6 Voluntary agency.....	389	0	72	37	3	113	2	0	206
7 Industry.....	1	0	0	1	0	1	0	0	1
8 Private.....	3, 362	6	863	1, 253	12	1, 629	16	1	397
9 Other State agency.....	412	1	63	110	6	209	0	0	112

NOTE: The column of numbers to the left of the agencies represents a numerical code used in tabulation.

**Table 2. Report of certain health department services by program, Michigan Department of Health, 1958**

Organization unit	Code	People served by program									
		Total	Communicable disease	Maternity	Child health	Tuberculosis	Vene-real disease	Chronic disease	Dentistry	Environmental health	General
Total.....		45, 650	307	6, 121	34, 854	547	118	5, 940	196	118	10, 893
Nutrition.....	350	11, 448	11	1, 550	5, 743	122	0	4, 250	142	48	2, 702
Nursing.....	360	6, 380	294	839	2, 495	418	118	1, 687	54	61	4, 365
Maternity and child health:											
Hearing.....	343	18, 118	0	0	18, 118	0	0	0	0	0	0
Vision.....	344	4, 685	0	4	4, 667	0	0	0	0	0	59
Hospital services.....	346	5, 019	2	3, 728	3, 831	7	0	3	0	9	3, 767

procedures. The problems ironed out with that program reduced considerably both the problems and time required to establish the system in these other programs. However, successive

adaptations to new programs have helped to sharpen the definitions and to clarify policies for all programs. Trends are now available for all of the five programs and the annual sum-

**Table 3. Nutrition services by worker, area, and program, Michigan Department of Health, 1958**

Service description						Program								
Worker No.	Geographic area	Agency	Personnel	Activity	Unit	Total	Communicable diseases	Maternity	Child health	Tuberculosis	Chronic diseases	Dentistry	Environmental health	General
						2, 943	10	228	1, 891	58	1, 419	125	42	328
2	3	0	11	1	1	6			2		4			
2	3	0	13	1	1	9		4	6	1	1	1		
2	3	0	13	2	2	6					6			
2	3	0	15	1	1	3			1		2		1	
2	3	1	13	1	1	1					1			
2	3	1	21	1	1	3					3			
2	3	2	11	1	1	7					7			
2	3	2	11	2	2	3					3			
2	3	3	11	1	1	2			2		3			
2	3	3	21	1	1	2			2					
2	3	3	35	1	1	2			2					
2	3	5	11	1	1	1					1			
2	3	8	45	1	2	3					3			
*2	5	0	13	1	1	1		1	1		1			
2	5	3	21	1	1	3			3					
2	5	8	45	1	1	2		2						
2	6	0	13	1	1	2			2	1	1			
2	6	2	11	1	1	3					3			
2	6	3	21	1	1	12			12					
2	6	3	21	2	2	31			31					
2	6	3	34	1	1	1		1	1					
2	6	3	35	1	1	1			1					1

maries are becoming more and more valuable to the program directors each year.

### Cross Tabulations of Data

Cross tabulations of the items in this system provide a wealth of information about health department services that have been given and call attention to the need for services where they have not been provided.

The cross tabulation of program and agency in table 1 shows the distribution of nutrition services to the various health department programs as well as to the several agencies. Similarly, for each program, there is a distribution of services by agency and for each agency there is a distribution by program. For example, the chronic disease services to 4,250 people represent well over one-third of all nutrition services; of these, 1,629, or 38 percent, were with private agencies; 1,143, or 27 percent, with local health departments; and 6 percent with colleges. Agencywise, hospitals received maternity, child health, tuberculosis, and chronic disease services as well as generalized nutrition services from the nutrition section.

Table 2 is a sample of a composite picture of health department services by program, the sum of the services contributed by each organizational unit. The sample includes the five organizational units currently using this system.

Table 3 gives a more detailed picture. It is a summary of the individual worker's services. From this, he knows how many persons he has served in each program by geographic area, agency, category of personnel, and by which method or activity these persons were served. For example, the line marked with an asterisk in table 3 is interpreted as follows: nutrition worker No. 2 held an individual conference with a local health department nurse in area 5 during which she provided service in relation to maternity, child health, and chronic disease.

Table 4 illustrates a continuing annual summary of the number and percentage distribution of nutrition services by program. The marked drop in services in 1954 is noticeable and was due to a decrease in staff. Since that time, some of the local health departments have employed nutritionists on their staffs with the result that fewer of the nutrition services to the State as a whole have been given by State-employed nutritionists. The increase in chronic disease service is also noticeable; this is the result of the recent responsibility of the health department for the licensing of nursing homes and homes for the aged.

Table 5 relates the number of activities to the number of people served and indicates the trend over the years. The services provided by means of conferences have consistently

**Table 4. Recipients of nutrition services by program, Michigan Department of Health, 1953-58**

Program	People served											
	1953		1954		1955		1956		1957		1958	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total.....	14, 597	100	9, 706	100	11, 433	100	11, 880	100	11, 708	100	11, 448	100
Communicable disease.....	18	0. 1	16	0. 2	18	0. 2	0	0	5	0	11	0. 1
Maternity.....	328	2. 2	268	2. 8	381	3. 3	524	4. 4	602	5. 1	1, 550	13. 5
Child health.....	9, 277	63. 6	5, 377	55. 4	6, 818	59. 6	7, 528	63. 4	7, 547	64. 5	5, 743	50. 2
Tuberculosis.....	278	1. 9	347	3. 6	233	2. 0	115	1. 0	127	1. 1	122	1. 1
Veneral disease.....	0	0	0	0	0	0	0	0	1	0	2	0
Chronic disease.....	1, 477	10. 1	1, 063	10. 8	1, 356	11. 9	1, 456	12. 3	2, 695	23. 0	4, 250	37. 1
Dentistry.....	76	. 5	26	. 3	157	1. 4	28	. 2	26	. 2	142	1. 2
Occupational health.....	201	1. 4	0	0	0	0	2	0	2	0	0	0
Environmental health.....	72	. 5	152	1. 6	4	0	6	. 1	396	3. 4	48	. 4
General.....	4, 413	30. 2	3, 114	32. 1	3, 741	32. 7	2, 900	24. 4	3, 014	25. 7	2, 702	23. 6

**Table 5. Activities and people served through nutrition services, Michigan Department of Health, 1953-58**

Type of activity	1953		1955		1956		1957		1958	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>Activity</b>										
Total .....	2, 622	100	3, 072	100	1, 634	100	1, 635	100	2, 341	100
Conference .....	2, 164	82. 5	2, 789	90. 7	1, 326	81. 1	1, 381	84. 5	2, 035	86. 9
Talk .....	254	9. 7	143	4. 7	192	11. 8	147	9. 0	189	8. 1
Institute .....	65	2. 5	30	1. 0	27	1. 7	8	. 5	6	. 3
Inspection .....	135	5. 1	55	1. 8	65	4. 0	95	5. 8	82	3. 5
Training .....	2	. 1	39	1. 3	20	1. 2	2	. 1	27	1. 1
Other .....	2	. 1	16	. 5	4	. 2	2	. 1	2	. 1
<b>People served</b>										
Total .....	14, 597	100	11, 433	100	11, 880	100	11, 708	100	11, 448	100
Conference .....	3, 633	24. 9	4, 383	38. 3	4, 287	36. 1	3, 439	29. 4	3, 987	34. 8
Talk .....	7, 084	48. 6	5, 458	47. 8	6, 434	54. 2	7, 228	61. 7	6, 873	60. 0
Institute .....	3, 289	22. 5	1, 012	8. 9	882	7. 4	653	5. 6	247	2. 2
Inspection .....	532	3. 6	238	2. 1	153	1. 3	342	2. 9	138	1. 2
Training .....	10	. 1	325	2. 8	122	1. 0	9	. 1	98	. 9
Other .....	49	. 3	17	. 1	2	0	37	. 3	105	. 9

NOTE: Figures for 1954 not available.

ranged between 80 and 90 percent of all activities, serving between approximately 25 and 38 percent of the people. Although not shown in this table, it is possible to subdivide conferences into "individual" and "group" to further relate the activity to persons served and to indicate the amount of group approach.

Figure 2 shows the number of recipients of the various program services on semilogarithmic graph paper which indicates not only the relationship between the number of services in the several programs but also the rate of change in the number of services in each of the respective programs. The drop in tuberculosis services during 1955 and 1956 alerted the nutrition staff to the need for conferences with the staff of the tuberculosis division.

**Uses**

- These service statistics are used for—
- Special program reports.
- Staff meeting discussions.
- Program reviews, evaluations, and planning.
- Developing and administering training programs.

- In order to—
- Orient new employees.
- Write annual reports.

Point up areas for special studies and special program emphasis.

Justify increased budget and staff; distribution of categorical funds; and reorganization of program plan.

Indicate areas of progress and of need.

Evaluate local use of State consultants.

Determine services provided in areas of the State without health departments.

Provide information to legislative and budget authorities.

Monthly and annually, the program director receives a copy of the tabulation of total staff services and a copy of each individual worker's services. The individual worker also receives a copy of the total staff services but only a copy of his own individual services, not those of his co-workers. It is important that the individual worker receive a report of his services to provide him with the means of evaluating and planning his own work, as well as to receive something valuable and useful in return for his efforts of recording data. This makes him better able to see his services in relation to the total services of his organizational unit, a factor conducive to the team approach.

Reviewing monthly and annual summaries at



staff meetings is very valuable to the individual worker as well as to the program director because each worker has an opportunity to see the overall result of the combined efforts of the staff as well as his own contributions. This type of review also frequently serves as a self-correcting device. It is not uncommon for questionable figures to appear and after some discussion, it is discovered that there is lack of uniformity among the staff in recording their services. For example, it was learned that for services in nursing homes, some workers were coding them as "private" and some were coding them as "institutions." These examples of misplaced data due to miscoded reports are of tremendous assistance to the worker in helping him to more fully understand the categories of information which he is asked to code on the record. Knowing where he wants his efforts to appear in the

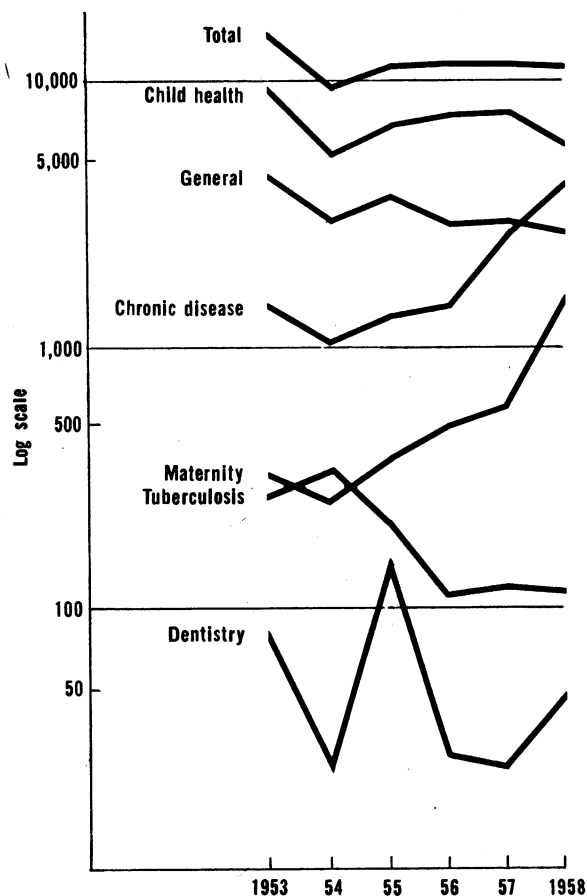
summary reports helps him to code his services more accurately.

These continuing annual summaries provide the program directors with data helpful not only for future planning but also for deciding emphasis in program operations. After 2 successive years of decreasing nutrition services to the tuberculosis program, the nutrition section assigned a graduate nutrition student the project of determining the reason for the decline in tuberculosis services and also to discover where these services were most needed in the program. This information also served as the basis for joint conferences with the tuberculosis and adult health division to review their total program with special concern for nutrition emphasis. This created an awareness of the services available from the nutrition section.

The nutrition section also makes extensive use of this information in State and local training programs. Their graduate students and trainees in local health departments also use this system to record their services and send them in to the State office, thus providing actual figures which are convincing evidence that trainees give a great deal of service while they are being trained. These factual data indicated that the nutritionist provides a departmentwide service to the local health department programs, thereby justifying the expenditure of money to establish a nutritionist position on the staff. So far, two local health departments have established nutritionist positions on their staffs. One of the local health officers requested from the State the service statistics of his nutritionist to include in his annual report.

The fact that the State health department also has the statistics from the local areas makes it possible to evaluate not only the nutrition services of the State staff but to have information concerning total nutrition services given within the State, by State and local health departments. In other words, the system provides a means of both selling and evaluating. More and more graduate schools are becoming concerned with training for supervisory nutrition positions. To date, three students have come to Michigan for supervisory field training. The interpretation and use of this system provided the basis for the most important part of

**Figure 2. Number of recipients of nutrition services by program, Michigan Department of Health, 1953-58**



their training. It is a concrete constructive device to use in training and supervision and a tool which they can use in the future.

The first annual summary of the hearing program pointed up the volume of casefinding services and the proportionately small amount of consultant service. The maternal and child health director and hearing consultants had been aware of this situation and realized that consultants on the State level should provide more consultant service and do less casefinding. A bar diagram chart of these services pointed up the relationship very sharply and gave support to the hearing program's long-range plan for decentralization. Plans were made for further decentralization of casefinding activities. This resulted in many local health departments employing hearing conservation staff.

#### **Comments**

Comments have been received from two program directors using this system to the effect that because they are accustomed to working with and thinking in terms of individuals, it is hard for them to think in terms of large numbers. This is particularly true of some of the people trained in the clinical field. They recognize the need for service statistics but find it difficult to know how to record them or how to think in terms of counting them. Once these data are summarized, related to each other, and presented in such a way as to indicate trends

over the years, they can readily relate past incidents and problems of their programs to the fluctuations in these trends. With this visual impression of the past, they can more readily visualize their future goals. Also, they are much more aware of the relative position that each part of their work contributes to their total program and are able to adjust their activities and program content according to their goals; for example, the people in the hearing program further decentralized their casefinding activities and the nutrition people took steps to increase their services to the tuberculosis program.

#### **Summary**

As the scope of public health takes on new proportions, the number of public health disciplines increases and, consequently, a greater need arises for service statistics by program for health departments as a whole as well as by specific divisions within the department. These statistics are valuable not only for program planning and evaluation, including training programs, but as documentary evidence for budget requests, justification of categorical funds, and as an aid in making an equitable distribution of services and funds.

This account describes the development and use of a mark sense punchcard system for obtaining service statistics. With this system, collection of the data is simple and the tabulating possibilities are both multiple and flexible, providing useful information for the individual worker, program director, and administrator.

### **Safety Leaflet for the Aging**

"Getting on Safely," a leaflet to help aging men and women to avoid accidents, was recently published by the National Safety Council.

Among men and women over 65 years of age, the incidence of fatal and crippling injuries is relatively high. Three-fourths of all accidental deaths from falls during 1957 occurred in this age group.

A sample copy of the leaflet may be obtained free of charge from the National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill. The minimum purchase order accepted is for 50 copies (\$2.80).