DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF MEDICAL LABORATORY MANPOWER

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Introduction

Information on the demographic characteristics of medical laboratory manpower has never been gathered in detail and on a regular basis even though such an evaluation of the current work force has long been needed by the medical profession, government agencies and other organizations in the health field.

Prior to this survey, made in late 1969 and early 1970, information on registered laboratory workers was collected by the National Committee for Careers in Medical Technology (now The National Committee for Careers in the Medical Laboratory) through a salary survey in 1959 and 1963, and a more detailed study of salaries and employment status in 1966. An earlier study of salaries was made in 1954 by Dr. J. L. Arbogast. Analyses of the 1959, 1963 and 1966 surveys were published in the National Committee for Careers in the Medical Laboratory (NCCML) publication GIST, issues 7, 22 and 36.

Late in 1969 an opportunity came to NCCML to include a questionnaire in an annual mailing concerning re-registration sent by the Board of Registry of the American Society of Clinical Pathologists to all currently certified laboratory personnel. Since that was the last year in which annual registration was compulsory, NCCML deemed it an opportunity to collect a variety of basic data from this group of individuals.

After extensive consultation and revision, a questionnaire was devised covering type of registration, age, highest education attained, recent participation in continuing education courses and workshops, place of employment, level of principal employment, duties of principal employment, salary and work history. From the medical technologist no longer working in the laboratory, data was sought on present status and reason for it, work history, intentions about returning to work and need for refresher training. Certain questions covered persons in the armed forces and those whose work was in the field of environmental health.

The original questionnaires were sent to all American Society of Clinical Pathologists (ASCP)-registered medical laboratory personnel by the ASCP in Chicago in December 1969 and were returned directly to NCCML in the early months of 1970. Those listed in "Register 1969, Certified Medical Laboratory Personnel," published by ASCP, total about 60,100. For this analysis, some 29,000 questionnaires, based on the response to the item, State of residence, were considered useable, reflecting a 48.3 percent response. (Table 1).

In addition, a similar questionnaire altered only to reflect titles of laboratory personnel in California, was mailed by the Department of Public Health of the State of California early in 1970 with returns coming directly to NCCML. The total number of licensed laboratory personnel in California at that time was 14,500 with about 4,400 questionnaires, based on the response to the item, State of residence, used for this analysis. This response was 30.5 percent. Responses were not used if the respondent stated they had already answered the earlier questionnaire.

Thus the useable replies totaled about 33,500 for a total response rate of 44.8 percent. Inter-society controversy in the medical laboratory field at that time undoubtedly kept a number of individuals from returning their questionnaires.

The Universe Versus the Respondents

The universe of registered and/or licensed medical laboratory manpower and the number of respondents to the questionnaire items, State of residence and/or place of principal employment, are compared in Table 2. The latter group, those who were currently working full-time, part-time, or irregularly in the medical laboratory field, totaled about 24,000, or 71.7 percent, of the former group responding to the item State of residence.

Sex and Age

The descriptive term "manpower" in the phrase "medical laboratory manpower" is a misnomer since females constituted 87 percent of those responding to the questionnaire item. Almost half of all the respondents to the item on age were in the age category 25-34 years. The high concentration of medical laboratory manpower in the age category 25-34 years contrasts sharply with projections by the Bureau of Labor Statistics of the age distribution of the female labor force for 1970. The Bureau of Labor Statistics projects fewer female workers in the ages 25-34 years than in the older years 35-44 years of age, or even of those 45-54 years. The comparison may be invalid when 29 million female persons in the total labor force is compared with some 30 thousand registered/licensed medical laboratory manpower. Further research of the characteristics of the non-respondents on the registries is surely needed to affirm conclusively the sex-age attachment to the labor force of medical laboratory manpower.

Possibly due to educational or other restrictions for ASCP registration or California licensure, hardly any respondent was under 20 years of age, while 240 of the older respondents were age 65 years and over, and some still employed at the age of 80 (Table 3).

Age and Activity of Respondents

Among the approximately 34,200 respondents, both active and inactive, about 9,900, almost 29 percent, were inactive -- i.e., almost one out of three respondents were not currently working either full-time, part-time, or irregularly in the medical laboratory field (Table 4). Considering that irregular employment may be considered as "frictional" or "marginal" employment, the rate of inactivity reported is probably a minimum. Since the Registry/Licensure population described earlier totals about 74,600, the almost 9,900 inactive respondents, or 13 percent, is relatively significant. If however, the inactive respondents are for the most part not "actively seeking work" in the medical laboratory field, then they possibly should not be considered in the "labor force" of medical laboratory manpower.

It is then possible that the rate of inactivity, in the sense of measuring "unemployment", may be overstated.

Active employment of the respondents who stated their age was 71 percent overall. Three age categories were below the overall average: age 25-34 years (68 percent); age 35-44 years (66 percent); and age 65 and over (52 percent). One may speculate that the smaller percentages of the first two ages are due to family responsibilities normally associated with female workers in those age groups. The younger age category, 20-24 years, had the highest activity rate (86 percent), which is what one might expect from our knowledge of labor force participation rates.

Age, Activity and Type of Registration

The inactive medical laboratory manpower were concentrated most heavily among medical technologists (ASCP registered and California licensed) and least heavily among the Cytotechnologists (ASCP registered) (Table 5). Based only on the number of respondents, the medical technologists rate of inactivity was 43 percent and the rate for cytotechnologists was 17 percent. The rates among the total population could very well be different from those given here, since the respondents constituted less than 45 percent of the entire population of registered or licensed medical laboratory manpower. Inactivity was highest in the age groups, 25-34 years and 35-44 years, and probably due to the high female to male ratio of medical laboratory manpower. No doubt, family commitments serve to keep many females from working full-time, part-time, or even irregularly in the medical laboratory field.

Highest Education Attained

The bulk of the medical laboratory manpower-- some 70% of the respondents-- hold a baccalaureate degree, which is not surprising since the minimum educational requirement for medical technologist (ASCP) is 4 years of college. Medical technologists held 96% of all the baccalaureate degrees among those who responded to the question on highest education attained (Table 6).

Continuing Education

Medical laboratory personnel are participating in educational opportunities in continuing education. Attendance of respondents at continuing education workshops or courses, of at least one day's duration in the year prior to the survey was reported by almost 40% of the respondents (Table 7). Attendance by a participant at more than one course during the year is, of course, not reflected here. Attendance did vary by type of registration-- of the 20,300 medical technologists (ASCP registered and California licensed) who were actively employed, almost 11,000, or 54 percent, attended continuing education workshops or courses in the medical laboratory field. Attendance by cytotechnologists was equally high (54 percent). Attendance by clinical laboratory assistants and histologic technicians dropped off to 45 percent and 35 percent, respectively. These percentages should not be construed to apply to the universe; they apply only to the sub-set of respondents.

The primary duties of the actively employed medical laboratory worker is also associated with participation in continuing education. General laboratory work was reported as the primary duties of 5,000 persons--presumably the normal, but certainly not the only, duties of the medical technologist. Some 4,300 medical laboratory workers described their primary duties as specialists in the laboratory. In contrast to those engaged in general laboratory work, laboratory specialists are usually limited to work in one area of the laboratory. One such specialist is the cytotechnologist engaged in screening slides in the search for abnormalities that are warning signs of cancer. Another is the histologic technician who specializes in cutting and staining body tissue for microscopic examination.

Space is not available to report on other major findings: e.g. current employment in hospitals; medical laboratory manpower in environmental health; salaries of full-time workers; reasons given for stopping work or current unemployment status; length of inactivity in and expectations for returning to the medical laboratory field.

Conclusions and Recommendations

The present survey, which is one of a series originating with the National Committee for Careers in the Medical Laboratory's need for information on salaries of laboratory workers, has been used primarily as a recruitment tool to entice persons into the medical laboratory field. In some respects, the current survey is deficient because response was low, less than 45 percent, and this raises questions about the characteristics of the non-respondents. Procedures to reduce non-response, if used at all, was ineffective. Questionnaires were accepted for data processing, even in those cases where only a minimal number of items had been completed, and without regard to the importance of these items. Since no classifying or screening variables were identified, no legible returned questionnaire was rejected. Turning to the contractor's final report, wherein the analysis for the most part, was done item by item, there is no respondent analysis reported on data sets. The data on tape presented some problems since the Bureau of Health Manpower Education used the tape in two ways: (1) to compare the data on tape with the contractor's final report; and, (2) to produce additional tabulations for the Bureau's own use. Without going into the specifics, we often were unable to reconcile the data items on tape with the data in the final report. Continuing effort is being made to reconcile these differences.

The introduction of probability sampling holds the most promise for improving the data collected from the medical laboratory Registry/ Licensure population. With the use of probability sampling, more of the financial resources can be allocated to increase follow-up procedures, and hopefully to reduce non-response to a manageable proportion consistent with dollar costs and sampling variances of the more important characteristics. The complexity of this kind of survey, involving difficult computer programming for handling cross-tabulations, suggests that professional assistance of survey statisticians be initiated early in the planning stage.

Table 1 Comparison of ASCP Registered Population and Respondents, Medical Laboratory Manpower, By States: 1969-70

State of Residence	REGISTRY POPULATION Number Registered	RESPONDENTS Number Responding	RESPONDENTS Percent of Registry Responding
TOTAL	60,113	29,040	48.3
Alabama	891	384	43.1
Alaska	93	50	53.8
Arizona	548	283	51.6
Arkansas	453	214	47.2
California	5,650	2,835	50.2
Colorado	1,161	599	51.6
Connecticut	917	441	48.1
Delaware	195	101	51.8
District of Columbia	216	86	39.8
Florida	1,874	922	49.2
Georgia	1,201	578	48.1
Hawaii	319	140	43.9
Idaho	223	131	58.7
Illinois	3,290	1,572	47.8
Indiana	1,444	728	50.4
Iowa	917	480	52.3
Kansas	1,062	516	48.6
Kentucky	1,108	503	45.4
Louisiana	1,286	572	44.5
Maine	172	96	55.8
Maryland	1,118	541	48.4
Massachusetts	1,370	555	40.5
Michigan	2,887	1,384	47.9
Minnesota	1,937	849	43.8
Mississippi	503	210	41.7
Missouri	1,328	639	48.1
Montana	308	171	55.5
Nebraska	657	321	48.9
Nevada	124	71	57.3
New Hampshire	223	127	57.0
New Jersey	1,480	685	46.3
New Mexico	301	156	51.8
New York	2,813	1,421	50.5
North Carolina	1,200	563	46.9
North Dakota	254	145	57.1
Ohio	3,128	1,539	49.2
Oklahoma	874	422	48.3
Oregon	827	398	48.1
Pennsylvania	3,222	1,541	47.8
Rhode Island	281	141	50.2
South Carolina	520	256	49.2
South Dakota	243	124	51.0
Tennessee	1,235	544	44.0
Texas	3,657	1,747	47.8
Utah	330	188	57.0
Vermont	185	90	48.6
Virginia	1,400	718	51.3
Washington	1,424	728	51.1
West Virginia	502	254	50.6
Wisconsin	2,283	1,091	47.8
Wyoming	113	76	67.3
Guam	5	5	100.0
Puerto Rico	355	106	29.9
Virgin Islands	6	3	50.0

Table 2 Comparison of Registry/Licensure Population and Number of Tape Records, by State of Residence and Place of Principal Employment: Medical Laboratory 1969-70

	ASCP Registered	California Licensed
Registry/Licensure Population	60,113	14,500
Number of Tape Records	30,263	4,522
Number of Codes Records	30,234	4,518
State of Residence:		
Number of Coded Records with State Codes	29,436	4,482
United States, including Guam, Puerto Rico, and the Virgin Islands, but excluding Foreign, illegal codes, and non-reporters	29,040	4,428
Place of Principal Employment:		
Number of Coded Records with State Codes	21,149	3,256
United States, including Guam Puerto Rico, and the Virgin Islands, but excluding Foreign, illegal codes, and non-reporters	20,796	3,214

Table 3 Sex and Age of Respondents: Medical Laboratory Manpower, 1969-70

	ASCP Registered (number)	California Licensed (number)
SEX:		
Female	26,715	3,386
Male	3,273	1,112
Total	29,988	4,498
AGE:		
Total	26,667	4,293
Under 20 years of age	6	2
20-24 years	4,150	198
25-34	13,579	1,683
35-44	5,470	1,183
45-54	2,455	816
55-64	867	311
65 and over	140	100

Table 4 Age Distribution of Active and Inactive Respondents: Medical Laboratory Manpower (ASCP Registered and California Licensed), 1969-70 1/

AGE:		Active	Inactive
Total	34,239	24,386	9,853
Age not reported	3,735	2,745	990
Age reported	30,504	21,641	8,863
Under 20 years of age	107	90	17
20-24 years	4,227	3,618	609
25-34	15,097	10,250	4,847
35-44	6,547	4,325	2,222
45-54	3,166	2,419	747
55-64	1,136	823	313
65 and over	224	116	108

1/ Total of Medical Technologists (ASCP Registered and California licensed), Histologic Technicians (ASCP), Cytotechnologists (ASCP), Certified Laboratory Assistants (ASCP), Other Not Specified.

Table 5 Age of Active and Inactive Respondents, by Type of Registration: Medical Laboratory Manpower, 1969-70

	Medical Technologist (ASCP Reg. & Calif. Lic.)	Histologic Technician (ASCP)	Cytotech-nologist (ASCP)	Clinical Laboratory Assistant (ASCP)	All Others
Total--All Ages					
Active	20,305	1,320	979	1,499	283
Inactive	8,842	428	173	349	61
Under 20 years of age					
Active	3	11	0	75	1
Inactive	2	4	0	11	0
20-24					
Active	2,547	239	137	682	13
Inactive	340	66	20	183	0
25-34					
Active	8,754	528	458	419	91
Inactive	4,395	204	112	112	24
35-44					
Active	3,693	239	158	148	87
Inactive	2,120	53	17	17	15
45-54					
Active	2,056	162	79	74	48
Inactive	715	17	3	5	7
55-64					
Active	747	5	34	16	21
Inactive	253	51	2	2	5
65 years or more					
Active	105	5	0	1	5
Inactive	94	1	3	1	9
Age unknown					
Active	2,400	131	113	84	17
Inactive	923	32	16	18	1

Table 6 Highest Education Attained by Respondents: Medical Laboratory Manpower, 1969-70

	ASCP Registered	California Licensed
Total	30,101	4,508
High School	640	10
Vocational or technical training-- post high school	1,526	66
Associate degree-- Junior College	1,403	135
Some college-- no degree	4,965	436
Baccalaureate (B.A. or B.S.)	20,505	3,462
Master's Degree	998	250
Ph.D., D.V.M., or Dr. in Education	53	73
M.D., D.D.S., or DMD	11	76

Table 7 Attendance of Respondents at Continuing Education Workshops or Courses in the Medical Laboratory Field, by Type of Registration and by Primary Duties: Medical Laboratory Manpower, 1969-70 1/

Number of Respondents--Total	34,223
Not Attending Workshops/Courses	20,739
Attending Workshops/Courses	13,484
Type of Registration (according to State of Residence):	
Number of Respondents--Total	12,760
Medical Technologists	10,953
Histologic Technicians	460
Cytotechnologists	524
Clinical Laboratory Assistants	674
Others	149
Primary Duties (according to State Where Employed):	
Number of Respondents--Total	11,608
General Laboratory Work	5,013
Laboratory Specialist	4,269
Administration (Laboratory or Education)	1,394
Teaching	389
Research	444
Others	99

1/ Attendance of at least one day's duration in the prior year.

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