

## ASCP 2005 Wage and Vacancy Survey of Medical Laboratories

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This report marks the tenth year of the ASCP Wage and Vacancy Survey. Over the years, this confidential survey of hospital, reference, and physician office laboratory facilities has become a primary information source for academic, governmental, and industry experts in defining the state of the nation's laboratory workforce. It collects current wage and vacancy data for medical technologists (MT), medical laboratory technicians (MLT), phlebotomists (PBT), histotechnicians (HT), histotechnologists (HTL), and cytotechnologists (CT). While strict attention is always given to continuity, the survey has evolved to keep pace with changes in the profession. New position categories have been added, and new questions have been posed to examine some of the factors affecting wage and vacancy rates. Benchmarking current wage and vacancy rates, however, remains the primary objective of the survey; and in this regard, the 2005 survey was quite successful.

## Methodology

### Survey Administration

The survey was conducted by The Colette Steward Group, Inc, an independent research and management firm, in collaboration with Nancie Noie Thompson, ASCP's Director of Membership. Preparation for the survey began with a meeting of an informal advisory group of ASCP members, Bette Jamieson, MT(ASCP)SH, E. Susan Cease, MT(ASCP), and Marian Cavanaugh, MS, MT(ASCP)DLM. In line with the recommendations of this group, the 2005 questionnaire was updated to request respondents to provide wage and vacancy data regarding laboratory assistants (LA). Questions regarding productivity, work strategy, wage structure, and retirement patterns were also added to explore recent trends in wage and vacancy rates. Even with these additions, the advisory group was sensitive to the time required for respondents to complete the questionnaire; the overall length of questionnaire was not increased.

### Assessing Validity

As in every year, improving the validity of the survey findings was of uppermost importance. The first type of validity we will consider here, internal validity, refers to precision of the questionnaire as a data collection instrument. It measures whether a particular question item queries for the intended information. With careful analysis and revision, such as described above, the internal validity of the survey questionnaire has been increasingly strengthened with every survey year.

Assumptions of external validity, the second type of validity, however, are more difficult to define. External validity compares data derived from one or more subgroups of a population to data collected from an entire population. External validity is considered strong when the findings drawn from the subgroup and population are the same. The cost of verifying this match is usually prohibitively high, and instead external validity is assumed to be strong if the size of the subgroup is adequately large and it shares certain characteristics with the population. Even with this strategy, cost remains an issue. Despite the interest in increasing external validity as much as possible, one must weigh it against the possibility of making burdensome requests of the survey participants or creating administrative inefficiencies.

In this survey, a total of 3,614 laboratories with validated mailing addresses were selected from the ASCP membership database. Duplicate laboratory listings were also resolved, reducing or eliminating the possibility a laboratory would submit more than one survey for analysis. To increase the probability a laboratory would participate in the survey, questionnaires were addressed to a senior-level laboratory contact.

Questionnaires were mailed during the second week of November 2005. Laboratory contacts were telephoned by interviewers to encourage their participation, and additional questionnaires were faxed or mailed to non-responding laboratories over the following months. Special efforts were made to increase the total number of reference and physician office laboratory respondents.

In calculating the response rate, we have conservatively set the number of ineligible laboratories at 70, (ie, no longer in operation, unable to locate) establishing 3,544 as the number of laboratories that were eligible to participate in the survey. A total of 749 surveys were judged usable, yielding a response rate of slightly greater than 21% (.2113). The sample size was sufficient to provide a margin of sampling error of  $\pm 3.52\%$  at a 95% confidence level. Of course, since not all laboratories employ staff at each of the position levels, the number of cases at the subgroup level may be less. **Table 1** lists the number of laboratories that participated by type and geographic region.

Compared to national estimates of the population,<sup>1</sup> a moderately higher percentage of the survey respondents reported working at a hospital or clinic laboratory. Survey respondents were more likely to work in laboratories located in the West South Central region; they were also less likely to work in the North East. Despite these differences, we have concluded that the sample is generally representative of the United States' laboratories and that the effect of these differences on the findings can be accounted for by the margin of sampling error.

## Findings

### Recruiting and Retaining Quality Staff

Nearly 44% (43.9) of laboratories report that they are currently experiencing difficulties in recruiting or hiring medical laboratory personnel. At a mean of 2.22 months, refilling HT

**Table 1** Number of Responses by Laboratory Type and Geographic Region

	n	%
Hospital Laboratory	493	65.8
Clinic	58	7.7
Physician Office	111	14.8
Reference Laboratory	77	10.3
Other	10	0.13
Total	749	100.0
South Central Atlantic	184	24.6
Far West	133	17.8
West North Central	64	8.6
East North Central	139	18.6
West South Central	137	18.3
North East	91	12.2
Total*	748	100.0

\*An analysis of outlier values indicated that one of the responding laboratories should be excluded from the analysis.

and HTL positions appeared to take the longest time. The mean time required to fill MT and CT positions were a close second. Laboratories reported that it took longer than 2 months (2.14) to fill MT positions and 2.17 months to successfully recruit CTs. **Figure 1** illustrates the differences in the mean time to re-fill the 6 position categories queried.

In general, increases were balanced out by decreases in staff turnover for supervisor and manager level MTs. However, laboratories were more likely to experience a decreased number of turnovers at the MT staff level. More than 22% (22.2) of the responding laboratories reported a decrease in MT staff turnover; 7.9% reported an increase.

This was also true in regard to PBT staff level turnover. A total of 22.9% of laboratories reported a decrease in PBT staff turnover; 6.4% reported an increase. Turnover was similar for MLT and LA staff level employees. A total of 12.7% of laboratories reported a decrease in MLT turnover, while 4.9% of laboratories reported an increase. A total of 10.0% of laboratories reported a decrease in LA turnover, and 3.8% of laboratories reported an increase. To attract recruits, laboratories were most likely to offer larger salaries (42.3%), reimburse educational costs (27.4%), or offer sign-on bonuses (21.4%). Another popular strategy for coping with staffing shortages was the use of per diem or temporary staff (22.4%).

In regard to filling shifts, MT staff positions were most difficult to fill. Nearly 32% of laboratories that were experiencing recruiting problems reported difficulties finding MTs to work overnight shifts. However, this shortage appeared to be true also for day, evening, and weekend shifts. Finding staff-level MLTs for evening and overnight shifts was also difficult. More than 19% of these laboratories reported having problems finding staff-level MLTs to fill the evening (19.6%) and overnight (19.4%) shifts.

### Current Vacancy and Pay Rates

The questions that are at the core of the study are about current vacancy and hourly pay rates for laboratory staff. In order to investigate how these factors differ between laboratories, we gathered data on demographics such as laboratory type, geographic location, and facility size (ie, bed size, inpatient occupancy rate). Following are some highlights from our findings. Analysis reflects reports of hospital, clinic, POL, and reference laboratories only.

### Vacancy Rates

**Table 2** compares vacancy rates for certified positions during the last 4 survey years. While these rates have not returned to the high levels reported prior to 2002, vacancies appear to be increasing for a number of positions. Vacancy rates increased for all MT levels, MLT supervisors, PBT supervisors, and HTLs. Vacancy rates continue to drop for HTs at the staff and supervisor level. Vacancies were highest among LA staff and supervisors.

Comparisons between certified and non-certified vacancies are difficult for a number of reasons; foremost being that the count of non-certified staff is much less, which makes the analysis less reliable. However, vacancy rates for non-certified laboratory staff are more likely to be higher; as much as 4% higher than the vacancy rates calculated for certified laboratory staff. Additional research should be conducted to develop better ways to measure these differences.

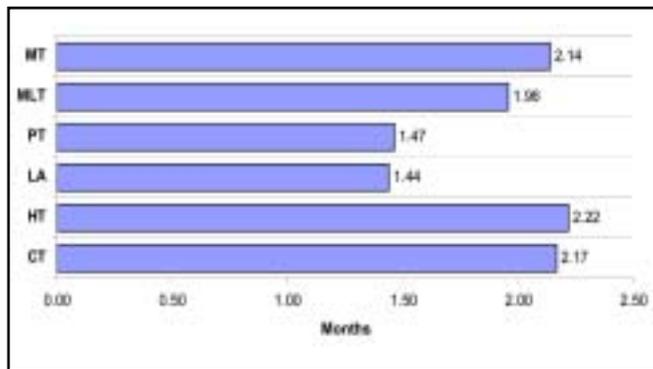


Figure 1\_Mean number of months to refill position.

Table 2\_Certified Vacancy Rates Comparison by Survey Year (Survey Year 2005 Count)

	n	2005	2003	2002	2000
MT Staff	534	0.06	0.04	0.07	0.11
MT Sup	389	0.04	0.03	0.06	0.13
MT Manager	451	0.04	0.02	0.04	0.13
MLT Staff	406	0.06	0.06	0.09	0.14
MLT Sup	76	0.03	0.02	0.07	n/a
PBT Staff	324	0.07	0.07	0.09	0.18
PBT Sup	119	0.05	0.03	0.08	n/a
LA Staff	155	0.09	n/a	n/a	n/a
LA Sup	30	0.10	n/a	n/a	n/a
HT	193	0.04	0.06	0.09	0.16
HTL	155	0.07	0.04	0.11	0.22
HT Sup	155	0.04	0.05	0.06	0.20
CT Staff	173	0.03	0.04	0.08	0.21
CT Sup	112	0.02	0.02	0.06	0.10

### Demographic Differences in Vacancy Rates

In general, vacancy rates for certified staff level MTs (.071) and MLTs (.075) were more likely to be higher than the average among reference laboratories. Slightly higher vacancy rates for PBT staff (.079), PBT supervisors (.060), and LA supervisors (.090) were reported by hospital-based laboratories. It also appears that vacancy rates for certified HTs, HTLs, and HT supervisors were higher for facilities with 500 or more beds.

Higher than average vacancy rates for certified staff-level MLTs (.093) were reported by laboratories with an annual test volume of 100,000 or less. The vacancy rate for certified PBT staff (.092) was higher among laboratories with an annual test volume of greater than 1 million. This was also true for certified HTLs (.092) and HT supervisors (.088).

Hospital-based laboratories with a bed size of 500 or more reported higher than average vacancy rates for certified MT staff (.104) and MT supervisors (.071). Vacancy rates for certified staff-level MLTs (.106) was higher in 300-499 bed hospital-based laboratories. Openings for certified LA staff rose with the inpatient occupancy rate. The vacancy rate for LA staff in these facilities was slightly greater than 13%.

There was also some variation by geographic region. Certified MT staff vacancies were higher than average in the Far Western (.079) and North Eastern (.077) states. Certified PBT staff (.088) and LA staff (.159) vacancies were highest in the Far West. There

**Table 3\_Median Average Wage Comparisons by Survey Year (Survey Year 2005 Count)**

	MT Staff	MT Sup	MT Manager	MLT Staff	MLT Sup	PBT Staff
n	510	365	364	416	70	414
Survey Year 2005	\$21.52	\$25.96	\$31.99	\$17.23	\$20.02	\$11.74
Survey Year 2003	\$20.00	\$24.50	\$30.00	\$15.96	\$18.79	\$11.03
\$ Difference	\$1.52	\$1.46	\$1.99	\$1.27	\$1.23	\$0.71
% Difference	0.07	0.06	0.06	0.07	0.06	0.06
	PBT Sup	HT	HTL	HT Sup	CT Sup	CT Staff
n	148	210	143	136	95	166
Survey Year 2005	\$16.79	\$18.47	\$21.63	\$25.97	\$30.54	\$26.17
Survey Year 2003	\$16.40	\$17.00	\$19.67	\$24.21	\$28.99	\$24.70
\$ Difference	\$0.39	\$1.47	\$1.96	\$1.76	\$1.55	\$1.47
% Difference	0.02	0.08	0.09	0.07	0.05	0.06

also appeared to be higher than average certified HT vacancies (.117) for laboratories located in the Far West. High vacancy rates were also reported by laboratories located in the North East region of the United States in regard to certified HTLs (.085).

**Wages**

The median average hourly wage continued to rise at a pace of about 3.5% annually. The increase for all position types and levels between the 2003 and 2005 survey years was 7%; unlike 2003, all positions at every level enjoyed some increase. Phlebotomy staff at the supervisor level realized the smallest wage increase and HT and HTL staff enjoyed the largest increases. **Table 3** compares the median average wage by position type and level during the last 3 years.

In addition to reporting the average hourly wage, laboratories were asked to indicate the lowest and highest hourly wage for each position. These findings may be indicative of the salaries that are offered to entry-level and senior-level laboratory staff. Overall, the lowest hourly rate averaged 8.5% less than the median average rate; the highest rates averaged 11% greater.

Median average hourly salaries were more likely to be higher among hospital-based and reference laboratories. Physicians' office laboratories reported the lowest median average hourly salaries. Salaries were also more likely to be higher in hospital-based laboratories with 300 or more beds. Higher salaries were also associated with hospital-based laboratories that reported an average inpatient occupancy rate of 50%, and higher salaries were also found among laboratories with a test volume of greater than 1 million tests per year. Salaries were also highest in the North East and Far West regions of the nation. Higher than average hourly salaries were also found in laboratories located in the West South Central, East North Central, and South Central Atlantic. **Table 4** presents the top 3 highest salaries by position and geographic region (the highest salaries are in bold).

**Staffing and Productivity**

Several new demographics were collected this year to create baseline measurements to explore whether there was a connection

**Table 4\_Top 3 Median Average Wages by Position and Geographic Region**

	Far West	North East	West South Central	East North Central	South Central Atlantic	West North Central
MT Staff	<b>\$25.00</b>	\$23.00	\$21.39			
MT Supervisors	<b>\$29.00</b>	\$27.83		\$25.43		
MT Managers	<b>\$34.63</b>	\$33.46		\$33.42		
MLT Staff	\$18.69	<b>\$19.72</b>		\$17.84		
MLT Supervisors		\$19.72	\$17.83	<b>\$21.50</b>		
PBT Staff	<b>\$14.00</b>	<b>\$14.00</b>		\$11.69		
PBT Supervisors	\$19.00	<b>\$20.25</b>			\$15.99	
LA Staff	\$13.57	<b>\$14.00</b>				\$12.00
LA Supervisors	\$17.16	\$19.07	<b>\$19.78</b>			
HT		<b>\$19.35</b>	\$18.72	\$18.51		
HTL	\$22.54	<b>\$23.73</b>				\$21.62
HT Supervisors	\$25.97	<b>\$30.00</b>				\$28.59
CT Staff	<b>\$29.66</b>	\$29.25		\$26.52		
CT Supervisors	<b>\$35.49</b>	\$31.26		\$31.78		

between wages, vacancy rates, and laboratory productivity. We asked laboratories to report on indicators of productivity such as the number of billable tests per full-time employee (FTE) and how front-end automation has affected staffing needs. We also collected information about what guidelines laboratories are using to determine staffing needs. Finally, we gathered information about strategies, such as the use of per diem staff that help laboratories manage their staffing needs.

Aware of the different systems that are used to measure productivity, we began our questions by asking laboratories to tell us how they measure productivity. Slightly more than 42% (42.3%) reported that they measure productivity in terms of the number of worked hours per units of service; only 22.9% of laboratories measured productivity by the number of paid hours per units of service. The majority of laboratories (56.2%) reported that their staff worked an 8-hour shift; however, 30.5% of laboratories reported that shift length varied between 8, 10, and 12 hours. Laboratory descriptions of staffing guidelines varied widely; however, many laboratories reported that staffing level decisions were based on current need.

Per diem or temporary staff made up a mean of 4.5% of part-time laboratory staff and 1.3% of full-time laboratory staff. Slightly more than 25% (25.2%) of laboratories included per diem personnel in their staff budgets and 41.6% indicated that this expense was not accounted for in either their staff budget or some other laboratory budget. A number of laboratories also indicated that they depended on the dedication of their staff to meet demand.

While greater than 83% (83.1%) of the laboratories that responded to our question about the impact of front-end automation on staff size requirements indicated that fewer staff were now required, both certified vacancy and hourly wage rates appeared to increase with the number of billable tests that were performed per FTE. This was true for nearly every position. Certified vacancy rates were particularly higher than the average for MT staff and supervisors. Among facilities reporting 25,001 or more billable tests per FTE in 2005, MT staff certified vacancy rates were slightly greater than 2% higher (.086 versus

.064); MT supervisor vacancies were nearly 4% higher (.078 versus .039). Median average hourly wages ranged between \$.50 to \$2.80 higher than average in facilities with 200,000 or more billable tests per FTE. Among these facilities, the median average hourly wage for manager-level MTs was \$34.17; \$22.50 for MLT supervisors; \$28.77 for HT supervisors; and \$32.73 for CT supervisors.

### Future Staffing Issues

The laboratory faces significant challenges in recruiting and retaining quality staff in the coming years. Structural changes in laboratory science and automated technology are redefining the skills required for staff to thrive in tomorrow's laboratory. In addition to these changes is the image of laboratory work. Laboratories that reported difficulties in recruiting staff struggle with increasing competition for well-trained personnel (35.8%), lower compensation for laboratory employment in comparison to other careers (38.8%), and the perception the laboratory has less desirable working conditions in comparison to other careers (38.8%).

In past years, laboratories have lost highly skilled staff members who move into alternative careers, and they continue to watch training programs struggle to attract talented students to the profession. Their challenges are compounded by the coming tide of retirement among the baby-boomers. While additional research is required to make clearer comparisons, retirement projections are highest for MT staff positions. Large laboratories and those laboratories in the North East, South Central Atlantic, and Far West geographic regions will be hard hit by these retirement trends. By continuing to track these changes, the ASCP Wage and Vacancy Survey creates an invaluable foundation for developing strategies to meet these challenges head-on. LM

1. US Department of Labor, Bureau of Labor Statistics. Occupational Employment and Wages, November 2004, and US Department of Labor, Bureau of Labor Statistics. State Occupational Employment and Wage Estimates, November 2004.

## Key Terms

**Certified employees.** The questionnaire defines certified employees as those who received certification from a national organization, including but not limited to the ASCP.

**Geographic Regions.** **South Central Atlantic:** Alabama, Delaware, District Of Columbia, Florida, Georgia, Kentucky, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. **Far West:** Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana Nevada, New Mexico, Oregon Utah, Washington, and Wyoming. **West North Central:** Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota. **East North Central:** Illinois, Indiana, Michigan, Ohio, and Wisconsin. **West South Central:** Arkansas, Louisiana, Oklahoma, and Texas. **North East:** Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

**Median Wage.** The statistical median was used to measure wage. This particular measurement of central tendency eliminates biases caused by the abnormally low or high responses that skew means. Median wage was the wage at the 50th percentile when pay rates for a given position were ordered from lowest to highest. Pay rates are daytime wages and do not take into account differential or shift pay, bonuses, or benefits. Median wage was categorized into median lowest wage, median average wage, and median highest wage.

**Test Volume.** Laboratories that report conducting 1 million or more tests per year are categorized as high volume. Mid volume laboratories conduct 101,000 to 1 million tests annually. Low volume laboratories conduct 100,000 or less tests per year.

**Vacancy Rate.** Each surveyed laboratory with a particular position (eg, staff-level medical technologist) that responds to the 'number of budgeted positions' and 'number of vacant positions' was included in the certified vacancy rate computation. The mean of budgeted positions was calculated, as was the mean of vacant positions. The vacancy rate was the mean for vacancies divided by the mean for budgeted positions for any given position.