The Pacific Northwest Laboratory Medicine Sentinel Monitoring Network
Final Report of the Findings of Questionnaire 11
Test Volume and Menu Changes: 1997 to 1999

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BACKGROUND

The Pacific Northwest Sentinel Monitoring Network was created in January 1995 to gather ongoing information about practices in hospital, independent and physician office laboratories. To date, eleven questionnaires have been released to the network, exploring a variety of issues, such as: testing quality; access to testing services; laboratory-related problems and errors; personnel changes and training; proficiency testing participation; and waived and point of care testing technologies. The data gathered thus far have provided network participants, interest groups and regulators with information about trends in laboratory medicine, based on actual practices and experiences in testing facilities.

QUESTIONNAIRE 11

In April 1999, Questionnaire 11 was mailed to all 381 network laboratories. The intent of this questionnaire was to characterize changes that have occurred in test volumes and test menus in the past two years (April 1997 to April 1999). A nearly identical study was conducted in March 1996, when the network comprised 257 laboratories. This new study allows for a snapshot of recent changes and an evaluation of long term trends.

Two hundred fifty laboratories completed a questionnaire in time for analysis, a 65% response. Demographic characteristics of the respondents are summarized in Table 1.

Tests of significance were performed using Student's t-test, at 95% confidence limits (p=0.05).

Table 1 - Questionnaire 11 respondents (N=250 laboratories)

Demographic characteristic	**Percent of laboratories**
STATE	
Washington	50
Oregon	23
Idaho	18
Alaska	9
LABORATORY TYPE	
Physician office	60
Hospital	28
Independent	12
CENSUS BUREAU DESIGNATION	
Urban	58
Rural	42

FINDINGS

Changes in Total Test Volumes

Network laboratories were asked "In the past two years, has the total number of patient tests performed on-site increased, decreased or remained the same?" In this question, the total patient test volume was considered essentially the same if it remained within +/- 10%.

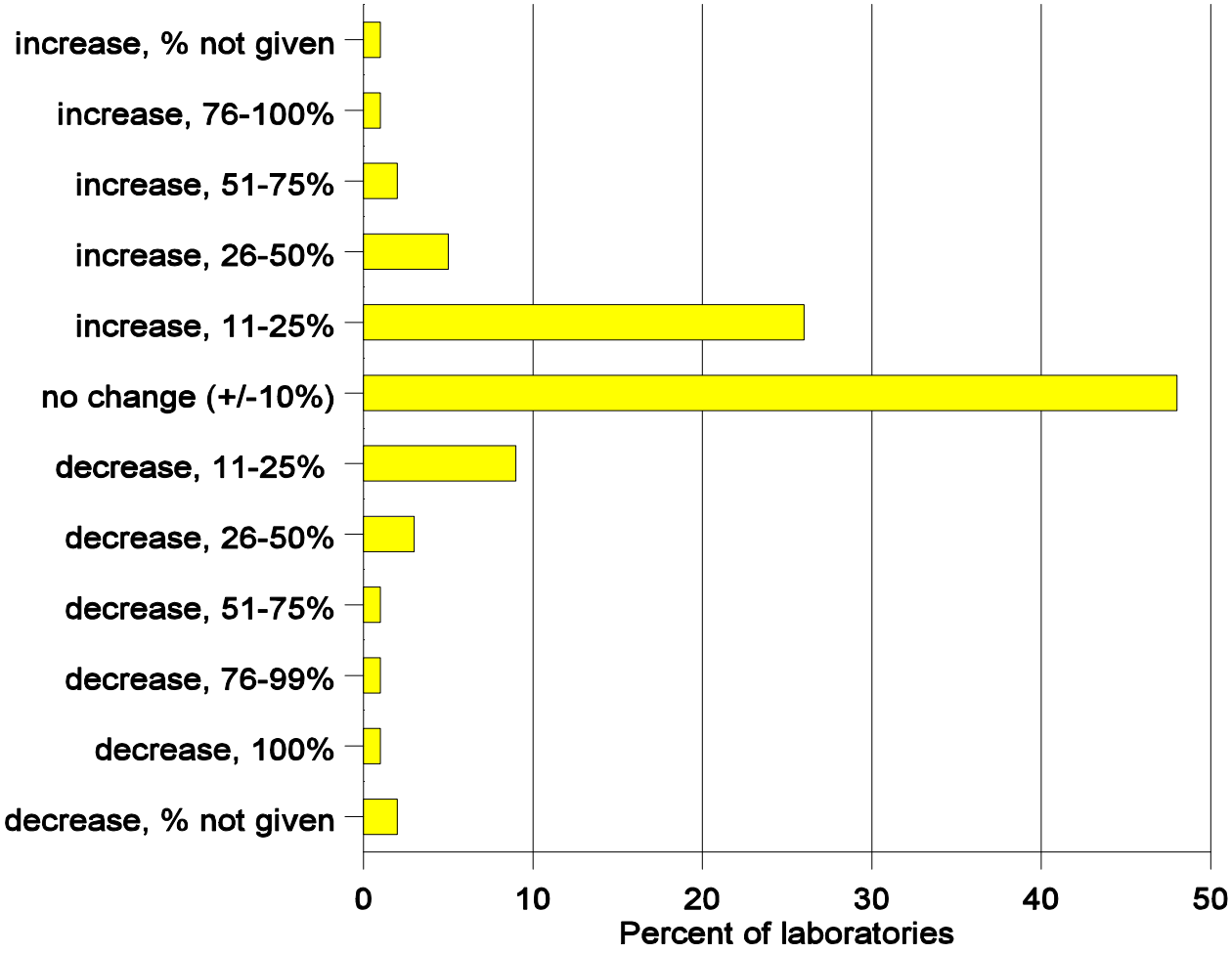
For 118 respondents (47%) the total patient test volume remained essentially the same. Eighty-five respondents (34%) indicated an increase and 42 (17%) a decrease. Two percent of laboratories did not know if they had a change. Sixty-two percent based their response on the review of actual records and 37% based it on an estimate. There were no significant differences between physician office laboratories (POLs), hospital and independent laboratories or between urban and rural laboratories. A significantly higher percentage of large laboratories increased test volumes than small laboratories. Table 2.

Table 2 - Changes in total test volumes

	Number of labs	**Changes in total test volumes (Percent of laboratories)**			
		Same	**Increase**	**Decrease**	**Don't know**
All	250	47	34	17	2
POL	151	51	31	15	3
Hospital	70	41	40	17	1
Independent	29	41	34	24	0
Urban	146	50	31	17	2
Rural	104	43	38	16	2
Annual test volume <10,000	118	52	27	18	2
Annual test volume >10,000	131	43	40	16	1

Of the 127 laboratories with a change, the most common percent change in test volume was between 11 and 25%. Figure 1 summarizes the patterns of total test volume changes among all respondents.

Figure 1 - Changes in total test volumes (N=245 laboratories)



Reasons for Changes in Total Test Volumes

Laboratories that recorded an increase or decrease in total test volumes were asked "What were the reasons for the change in total test volume?" Using a list of 18 possible reasons, participants were asked to choose one primary and up to two secondary reasons.

Laboratories with a Test Volume Increase

Of the 85 laboratories with an increase in test volume, 81 gave reasons. The top primary reasons given were: *Changes in practice - # providers, # patients seen, case mix of patients seen* (79%) and *Changes to meet community or client needs* (5%). The secondary reasons given most frequently were: *Availability of new testing technologies* (24%); *Changes to meet community or client needs* (19%) and *Result of mergers/acquisitions* (10%).

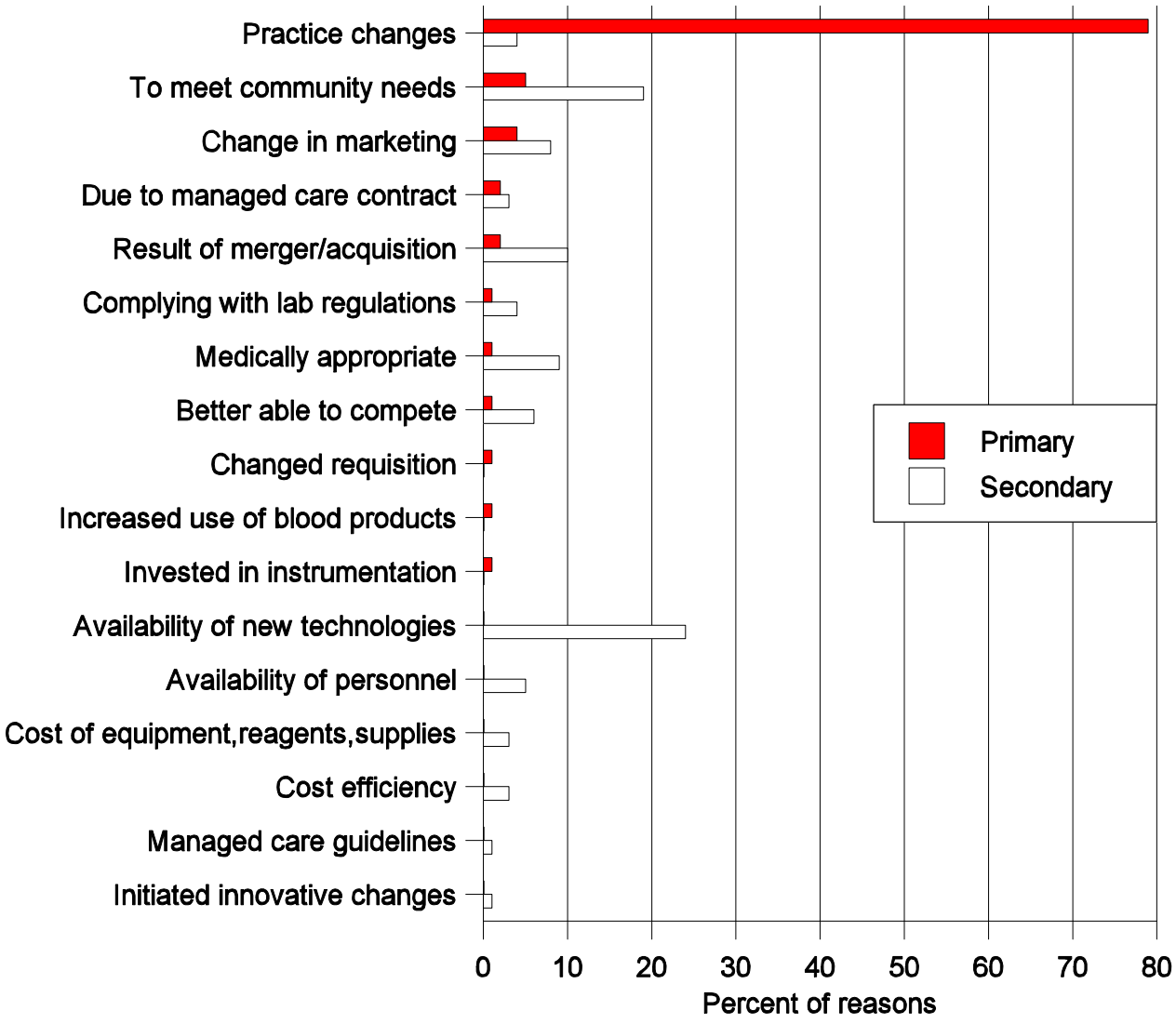
When individual reasons were grouped into categories of interest, those related to practice changes and marketplace issues (*Changes to meet community or client needs; Result of mergers/acquisitions; Better able to compete in current marketplace; Changes in marketing efforts*) accounted for 91% of all primary reasons given.

When all secondary reasons given were grouped, marketplace issues comprised 43% of the responses and test technology issues (*Availability of new testing technologies; Changes in costs of equipment, reagents, supplies*) accounted for 27%.

Testing performed on-site due to a managed care or insurance contract agreement accounted for 2% of the primary reasons and 3% of the secondary reasons given for a test volume increase.

Figure 2 shows a summary of the individual primary and secondary reasons given by respondents with a test volume increase.

Figure 2 - Reasons for test volume increases



For POLs, the most common reasons given (primary or secondary) for the increase in test volumes were related to changes in practice. For independent laboratories, the most common reasons related to marketplace issues. The most common reasons for hospital laboratories were split between practice changes and marketplace issues. Table 3.

Table 3 - Reasons for increases in test volumes

Reasons related to:	Percent of all reasons given (primary and secondary)				
	POL	**Hospital**	**Independent**	**Urban**	**Rural**
	45 labs 79 reasons	27 labs 61 reasons	9 labs 20 reasons	42 labs 77 reasons	39 labs 83 reasons
Practice changes (# providers, # patients seen, case mix of patients seen)	51	38	20	43	41
Marketplace issues (Changes to meet community or client needs; Result of mergers or acquisitions; Better able to compete; Changes in marketing efforts)	16	33	55	25	30
Test technology (Changes in cost of testing equipment, reagents, supplies; Availability of new technologies)	9	18	15	14	12
Managed care or insurance contract agreement	3	3	0	4	1

Laboratories With a Test Volume Decrease

Of the 42 laboratories with a decrease in test volumes, 40 gave reasons. The top primary reasons given were: *Changes in practice - # providers, # patients see, case mix of patients seen* (35%); *Changes in reimbursement for on-site testing* (18%); *Testing sent out due to a managed care or insurance contract agreement* (10%) and *Result of mergers/acquisitions* (10%).

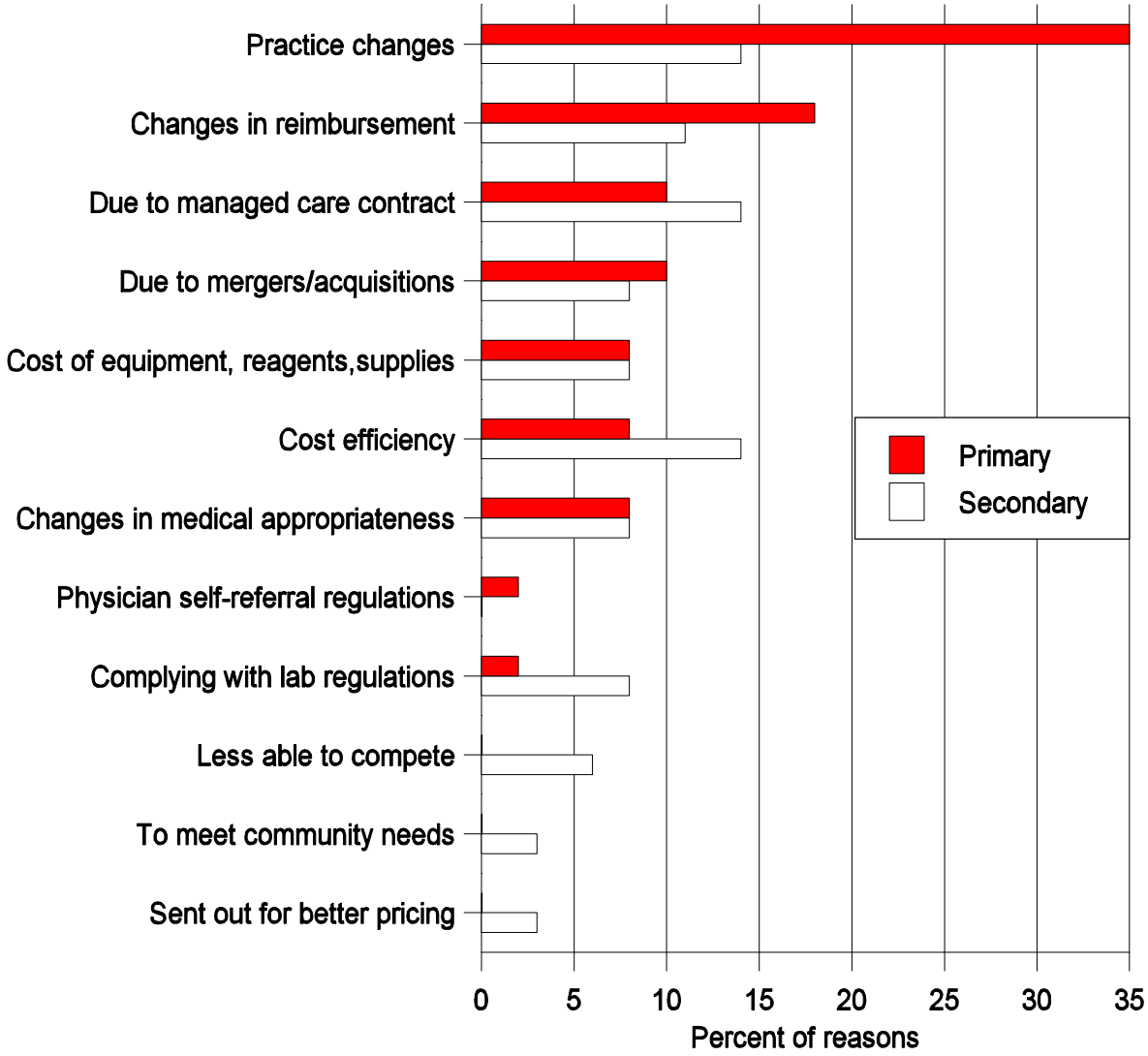
The most common secondary reasons given were: *Changes in practice* (14%); *Changes in cost efficiency - overhead costs, billable procedures* (14%); *Testing sent out due to a managed care or insurance contract agreement* (14%) and *Changes in reimbursement for on-site testing* (11%).

When individual reasons were grouped into categories of interest, those related to practice changes accounted for 35% of the primary reasons. Another 33% of primary reasons were attributed to costs (*Changes in cost efficiency - overhead costs, billable procedures*; *Changes in costs of testing equipment, reagents, supplies* and *Changes in reimbursement for on-site testing*). When all secondary reasons were grouped, issues related to costs comprised 36% of the reasons, with marketplace issues accounting for 17%.

When combining all reasons given (primary and secondary) by POLs, those related to costs were given most frequently. For hospitals and independent laboratories, practice changes and costs ranked highest. (A detailed comparison of reasons by laboratory type is not presented here, due to the low numbers of laboratories that had a test volume decrease in the last two years).

Figure 3 shows a summary of the individual primary and secondary reasons given by all respondents that experienced a decrease in test volumes.

Figure 3 - Reasons for test volume decreases



Laboratories that Discontinued Testing

Laboratories were asked to list up to five tests that were discontinued in the past two years. For each test listed, laboratories were asked to give one primary reason and up to two secondary reasons for discontinuing the test.

One hundred nineteen laboratories (48%) discontinued at least one test in the past two years. A total of 276 tests were discontinued by these laboratories. Chemistry tests were discontinued by the highest percentage of laboratories (60%), followed by: microbiology tests (29%); diagnostic immunology tests (22%); hematology tests (19%); waived tests (8%) and blood bank testing (<1%).

Hospitals and independent laboratories discontinued testing at a significantly higher rate than POLs. A significantly higher percentage of rural laboratories discontinued testing than urban laboratories and large laboratories discontinued testing at a significantly higher rate than small laboratories. Table 4.

Table 4 - Laboratories that discontinued testing

	POL	Hospital	Independent		Urban	Rural		Annual test volume	
								<10,000	> 10,000
Number of labs	150	70	29		145	104		117	131
Percent that discontinued tests	39	60	62		41	57		39	55

Reasons Tests were Discontinued

The most common primary reasons for discontinuing tests were: *Test volume was too low to be cost effective* (62%) and *Determined that test was not essential to perform on-site* (7%). The most frequent secondary reasons given were: *Proficiency testing was too costly* (14%); *Another lab could perform test less expensively* (13%); *Determined test was not essential to perform on-site* (13%); and *Reimbursement was too low to justify doing on-site* (10%).

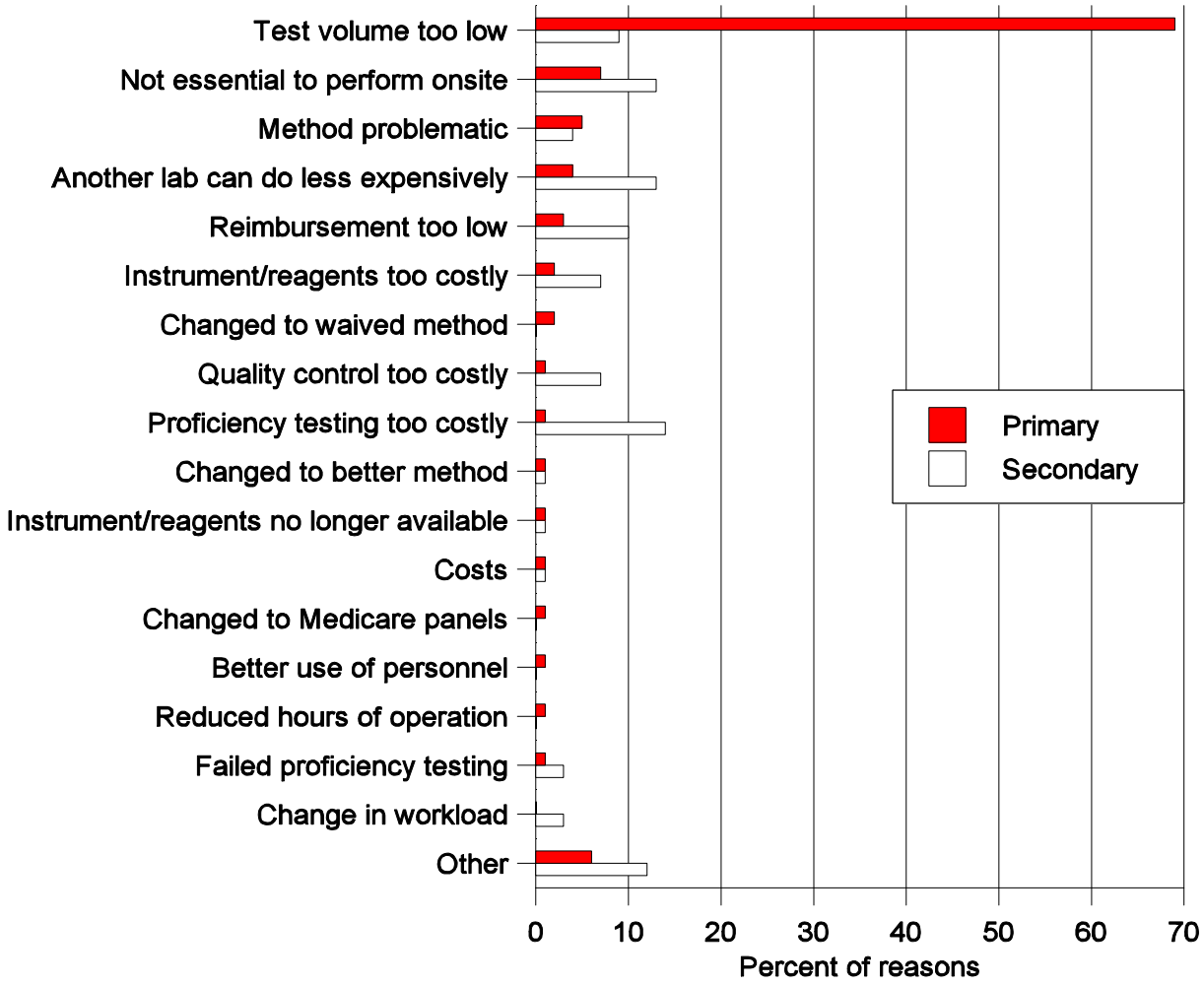
When individual reasons are grouped according to categories of interest, those related to practice changes (*Test volume was too low; Another lab could perform test on a STAT basis; Determined that test was not essential to perform on-site; Change in reference laboratory services; No orders; Reduced hours of operation; Next day results by reference laboratory*) accounted for 72% of the primary reasons.

When all secondary reasons were grouped, 34% related to non-regulatory costs (*Reimbursement was too low to justify doing on-site; Instrument or reagent costs were too high; Another lab could perform test less expensively; Too costly to automate*).

Mandated by a managed care or insurance contract agreement accounted for only 1% of the primary reasons and 2% of the secondary reasons for discontinuing a test.

Figure 4 summarizes all the primary and secondary reasons given for tests that were discontinued.

Figure 4 - Reasons tests were discontinued (N=119 laboratories)



Other reasons (each constitutes 1% or less of all responses): Due to a managed care contract; Results didn't match clinical impression; Couldn't find qualified personnel; Couldn't afford salaries for personnel; Another lab can perform STAT; Chose not to correct deficiencies; Change in reference lab's services; No orders; Not an appropriate test; Standardized between testing sites; Corporate decision; Test volume too low to remain competent; Couldn't grow control organism; Only test left on instrument; Too costly to automate; Too labor intensive; Sold practice.

Discontinued Testing According to Laboratory Specialties
A total of 142 chemistry tests were discontinued by 71 laboratories. About half (51%) of these were common, routine chemistries or chemistry profiles. Therapeutic drug tests accounted for another 15% of the tests discontinued and thyroid tests for 8%.

Forty-seven microbiology tests were discontinued by 35 laboratories. Chlamydia testing, cultures (other than urine and throat), gram stains and direct Strep antigen testing comprised 60% of the tests listed.

Twenty-six laboratories discontinued 39 diagnostic immunology tests. The tests most frequently discontinued were for rheumatoid factor (15%), prostate specific antigen (10%) and cytomegalovirus (10%).

Thirty-four hematology tests were discontinued by 23 laboratories. Reticulocyte counts accounted for 29% of the tests listed, followed in frequency by coagulation testing (21%).

Twelve waived tests were discontinued by 10 laboratories, including: mononucleosis, erythrocyte sedimentation rate; hemoglobin A1C, Helicobacter pylori antibody and direct Strep antigen.

One laboratory dropped blood bank testing and one discontinued microscopic procedures.

Reasons for Discontinuing Testing, by Laboratory Specialties
Within each laboratory specialty, each primary reason given at least once by a laboratory was counted and added to each of the secondary reasons given at least once by a laboratory. This total number of reasons was used to calculate the frequencies at which tests were discontinued, according to laboratory specialties and categories of interest. Table 5 summarizes this information.

Table 5 - Reasons for discontinuing testing by laboratory specialties

Reasons related to:	Percent of all reasons given (primary and secondary)				
	Chemistry	**Microbiology**	**Immunology**	**Hematology**	**Waived**
	71 labs 142 tests 128 reasons	35 labs 47 tests 65 reasons	26 labs 39 tests 36 reasons	23 labs 34 tests 43 reasons	10 labs 12 tests 23 reasons
Practice changes (Test volume too low; Change in workload; Not essential to perform on-site; Another lab can do STAT)	52	51	53	49	44
Costs (Non-regulatory) (Reimbursement too low; Instrument/reagent costs too high; Another lab can do less expensively; Could not afford salaries for personnel)	22	11	17	9	17
Regulatory (Quality control too costly; Proficiency testing too costly; Chose not to correct deficiencies; Couldn't find qualified personnel; Failed proficiency testing)	9	14	17	30	26
Method too complicated or problematic	5	5	0	7	9
	Tests listed as "method too complicated or problematic"				
	porphobilinogen CK potassium iron, IBC tobramycin theophylline HDL cholesterol LD bilirubin magnesium	parasitology Chlamydia GC culture	None	semen analysis platelet aggregation acid hemolysis sucrose hemolysis	Strep antigen mononucleosis

Focus on POLs that Discontinued Testing

A significantly higher percentage of rural POLs discontinued testing (54%) than urban POLs (33%). When comparing large and small POLs, there were no significant differences in the proportion of the laboratories that dropped tests.

The reasons for discontinuing testing fell into the following categories: Practice changes (48%); Regulations (19%); and Costs (19%).

Laboratories that Added Testing

Laboratories were asked to list up to five tests that they added to their on-site testing menus in the last two years. For each test listed, they were asked for one primary reason and up to two secondary reasons for adding the test. One hundred thirty-five laboratories (54%) added at least one test in the past two years. A total of 357 tests were added by these laboratories.

Chemistry tests were added by the highest percentage of laboratories (59%), followed by: waived tests (35%); diagnostic immunology tests (27%); microbiology tests (19%); hematology tests (16%); blood bank tests (1%); pathology tests (1%) and other (1%).

Hospital laboratories added tests at a significantly higher frequency than POLs or independent laboratories. A significantly higher percentage of rural laboratories added tests than urban laboratories and large laboratories added tests at a significantly higher rate than small laboratories. Table 6.

Table 6 - Laboratories that added testing

	POL	Hospital	Independent		Urban	Rural		Annual test volume	
								<10,000	>10,000
Number of labs	150	71	29		145	105		117	132
Percent that added tests	41	82	52		46	65		34	71

Reasons that Tests were Added

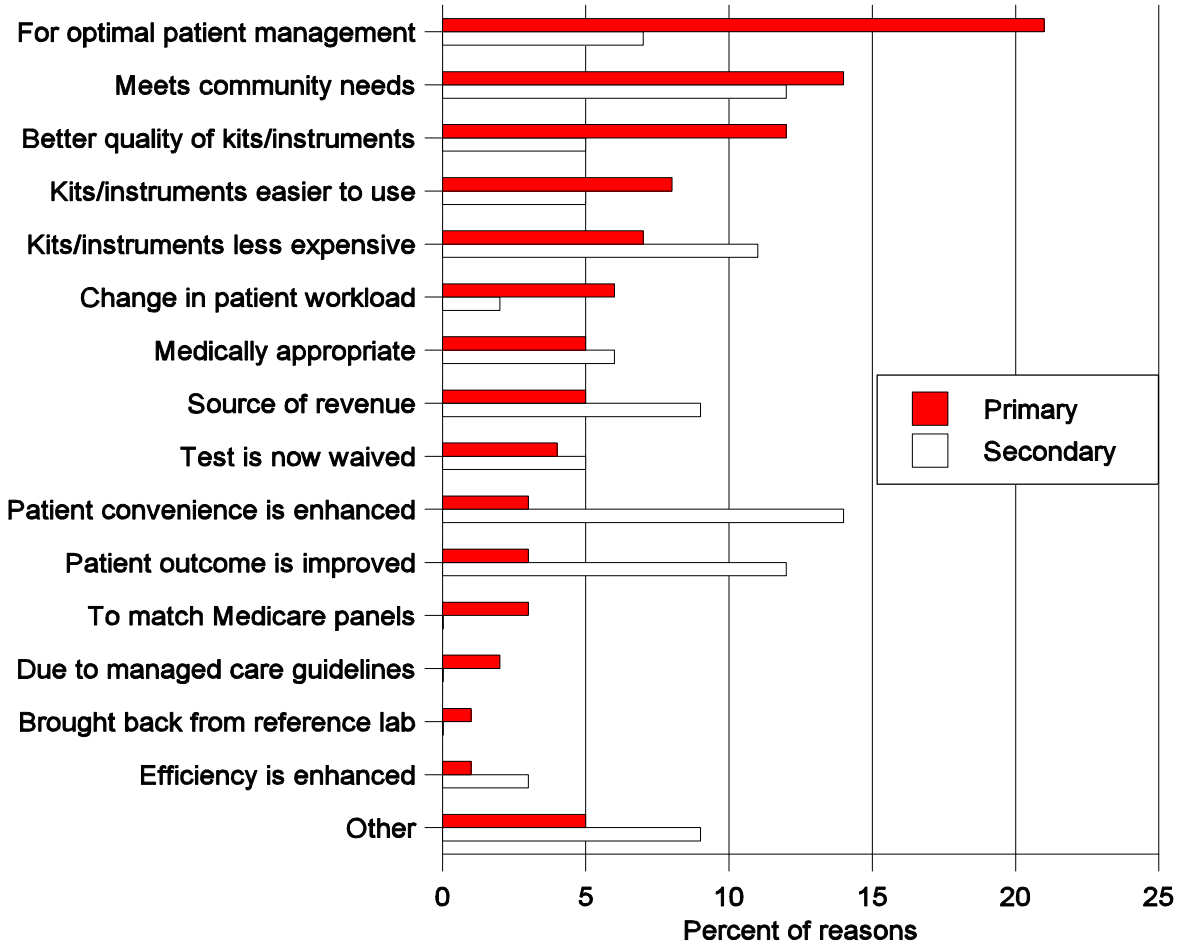
The most common primary reasons for adding tests were: *Test is deemed necessary to perform on-site for optimal patient management* (21%); *Meets the needs of community/clients* (14%) and *Better technology available: improved quality of kits or instruments* (12%).

The most frequent secondary reasons given were: *Patient convenience is enhanced* (14%); *Patient outcomes are improved* (12%); *Meets the needs of community/clients* (12%) and *Cost of kits or instruments are less expensive* (11%).

When individual primary reasons are grouped according to categories of interest, 27% related to patient outcome/convenience (*Test is deemed necessary to perform on-site for optimal patient management; Patient convenience is enhanced; Patient outcomes are improved*). Issues related to better testing technology (*Improved quality of kits or instruments; Kits/instruments are easier to use*) comprised 19% of the primary reasons for adding tests.

When all secondary reasons were grouped, the highest percentage (33%) related to patient outcome/convenience. Issues related to costs/revenue (*Costs of kits or instruments are less expensive; Cost to patient is reduced when performed on-site; Reimbursement is better; and Provides a source of revenue*) ranked next, comprising 26% of all secondary reasons.

Figure 5 - Reasons tests were added (N=135 laboratories)



Other reasons (Each comprises 2% or less of all responses): Cost to patient is lower; Reimbursement is better; Complying with regulations not as difficult as perceived; Need to test staff; Requested by doctor/provider; Efficient to add more tests to existing instrument; For immediate results; For improved productivity; Got samples from manufacturer; To monitor antibiotic therapy.

Tests Added by Laboratory Specialties

Eighty laboratories added 178 chemistry tests. The following were the most commonly added chemistry tests: Routine chemistries and profiles (26%); cardiac markers [troponin, myoglobin, creatine kinase (CK) and CK isoenzymes](25%); and thyroid tests [free T3, free T4, total T3 and total T4] (12%). The single most commonly added chemistry test was troponin (16%).

Sixty-six waived tests were added by 47 laboratories. The following waived tests were added, in order of frequency: Helicobacter pylori antibody (32%); Strep antigen (17%); microalbumin (14%); mononucleosis (12%); and hemoglobin A1C (9%).

Thirty-seven laboratories added 51 diagnostic immunology tests. The most common test listed was H. pylori antibody testing (25%). Prostate specific antigen accounted for 16% of the tests, followed by hepatitis and HIV testing at 12% each.

Thirty-two microbiology tests were added by 25 laboratories. Most commonly listed were: Clostridium difficle antigen (16%); Chlamydia testing (16%); routine cultures (13%); and H.pylori testing [CLO test and H.pylori antigen](9%).

Twenty-six hematology tests were added by 22 laboratories. Hemoglobin A1C (38%) and coagulation tests [prothrombin time; anti-thrombin III; D-dimer; protein C; protein S](27%) were most popular.

One laboratory added compatibility testing, one added thin-prep PAP smears and one added fluorescent in-situ hybridization and pulse field electrophoresis testing.

Reasons for Adding Tests, by Laboratory Specialties

Within each laboratory specialty, each primary reason given at least once by a laboratory was counted and added to each of the secondary reasons given at least once per laboratory. This total number of reasons was used to calculate the frequency at which tests were added, according to laboratory specialty and categories of interest. Table 7 summarizes this information.

Table 7 - Reasons for adding tests by laboratory specialties

Reasons related to:	Percent of all reasons given (primary and secondary)				
	Chemistry	**Waived**	**Immunology**	**Microbiology**	**Hematology**
	80 labs 178 tests 196 reasons	47 labs 66 tests 113 reasons	37 labs 51 tests 74 reasons	25 labs 32 tests 50 reasons	22 labs 26 tests 44 reasons
Patient outcome/convenience (Test is deemed necessary for optimal patient management; Patient convenience is enhanced; Patient outcomes are improved)	29	28	24	34	39
Cost/Revenue (Costs of kits/instruments are less expensive; Cost to patient is reduced when performed onsite; Provides a source of revenue; Reimbursement is better)	19	15	28	6	18
Better technology (Improved quality of kits or instruments; Kits/instruments are easier to use; Test is now waived)	15	36	16	24	11
Practice issues (Changes in patient workload, case mix of patients; New medical knowledge that test is appropriate; Office efficiency is enhanced)	17	8	11	14	14
Meets the needs of the community or clients	12	9	15	14	14

Focus on POLs that Added Tests

A higher percentage of rural POLs (52%) added tests than urban POLs (37%) and large POLs added tests more frequently (60%) than small POLs (33%).

The following are reasons why POLs added tests: For enhanced patient convenience/outcome (32%); Costs (19%); Availability of new technologies (15%) and Because test is now waived (12%).

The following tests were deemed necessary to perform on-site for optimal patient management: **Chemistry**: Drugs of abuse, troponin, GPT, uric acid, CK, cardiac markers, blood gases, galactose, creatinine. Five POLs added CO2 and three added direct bilirubins in order to obtain

Medicare reimbursement for comprehensive or basic metabolic panels.
Diagnostic immunology: Influenza testing, H. pylori antibody
Hematology: Prothrombin time, coagulation testing
Microbiology: Dermatophyte test, yeast culture
Waived: Prothrombin time, pregnancy test, H.pylori antibody, mononucleosis, microalbumin, hemoglobin A1C.

DISCUSSION

In the past two years, almost half the respondents' test volumes remained the same. Among those with a test volume change, more had an increase than a decrease. The primary reasons for an increase in test volume were related to practice changes and marketplace issues. For laboratories with a decrease, the primary influences related to changes in practice and costs.

Forty-eight percent of laboratories discontinued at least one test in the past two years. Issues related to practice changes accounted for the majority of the primary reasons given. Non-regulatory costs ranked highest among all secondary reasons.

Fifty-four percent of laboratories added at least one test. Testing was added most frequently because it was deemed necessary for optimal patient management, for enhanced patient outcome and convenience and because better technologies were available.

Managed care or insurance contract agreements were not found to be a significant factor in determining where laboratory testing was being performed. The impact of laboratory regulations also played a minor role in on-site test menu choices.

Comparison of Changes in 1997-1999 and 1994-1996

We conducted a nearly identical study with Questionnaire 3, which was sent to 257 network laboratories in March 1996. When comparing the data gathered from Questionnaire 11 with that of Questionnaire 3, we find remarkable similarities.

Test volume changes

The patterns of changes in test volumes and the reasons for the changes are very similar between the two studies. (Tables 8, 9 and 10)

Table 8 - Test volume changes

	Percent of laboratories					
	Same		**Increase**		**Decrease**	
	94-96	97-99	94-96	97-99	94-96	97-99
All	46	47	35	34	18	17
POL	45	51	35	31	20	15
Hospital	50	41	36	40	14	17
Independent	47	41	35	34	18	24
Urban	48	50	35	31	17	17
Rural	43	43	36	38	21	16
Annual test volume <10,000	49	52	30	27	20	18
Annual test volume >10,000	44	43	40	40	17	16

Table 9 - Reasons for test volume increases

	1994-1996	1997-1999
Top primary reasons	Practice changes 69% Mergers, acquisitions 10%	Practice changes 79% To meet community needs 5%
Top secondary reasons	To meet community needs 17% New test technologies 16%	New test technologies 24% To meet community needs 19%

Table 10 - Reasons for test volume decreases

	1994-1996	1997-1999
Top primary reasons	Practice changes 37% Mergers, acquisitions 14%	Practice changes 35% Changes in reimbursement 18%
Top secondary reasons	Changes in cost efficiency 11% Changes in reimbursement 11% Due to managed care contract 11% Complying with lab regulations 11% Due to managed care guidelines 11%	Practice changes 14% Changes in cost efficiency 14% Due to managed care contract 14% Changes in reimbursement 11%

Discontinued Testing

A significantly lower percentage of POLs discontinued tests in 1997-1999 than in 1994-1996. The reasons for discontinuing testing in 1997-1999 are very similar to those listed in 1994-1996. (Tables 11 and 12)

Table 11 - Laboratories that discontinued testing

	Percent of labs								
	All	**POL**	**Hospital**	**Independent**		**Urban**	**Rural**		**Annual test volumes**
								<10,000	>10,000
94-96	55	56	57	50		51	66	47	63
97-99	48	39	60	62		41	57	39	55

Table 12 - Reasons tests were discontinued

	1994-1996	1997-1999
Top primary reasons	Test volumes too low 61% Method too problematic 6% Another lab can do less expensively 5%	Test volumes too low 62% Test not essential on-site 7%
Top secondary reasons	Test not essential on-site 18% Proficiency testing too costly 14% Quality control too costly 13% Another lab can do less expensively 13%	Proficiency testing too costly 14% Another lab can do less expensively 13% Test not essential on-site 13%

Table 13 - Tests discontinued

	1994-1996	1997-1999
Top chemistry tests	routine chemistries/profiles thyroid tests therapeutic drugs	routine chemistries/profiles therapeutic drugs thyroid tests
Top microbiology tests	Strep antigen Chlamydia parasitology other cultures	Chlamydia other cultures gram stain Strep antigen
Top immunology tests	mononucleosis rheumatoid arthritis hepatitis	rheumatoid arthritis prostate specific antigen cytomegalovirus
Top hematology tests	reticulocyte count coagulation complete blood count	reticulocyte count coagulation

In 1997-1999, microbiology tests were discontinued more for practice changes and less because of regulations than in 1994-1996. For immunology testing, regulations were given as a reason less frequently in 1997-1999 than 1994-1996 as well. (Table 14)

Table 14 - Reasons for discontinuing tests

Reasons related to:	**Percent of all reasons**							
	Chemistry		**Microbiology**		**Immunology**		**Hematology**	
	94-96	97-99	94-96	97-99	94-96	97-99	94-96	97-99
Practice changes	46	52	38	51	49	53	40	49
Costs	25	22	13	11	15	17	12	9
Regulations	11	9	35	14	29	17	26	30
Method too complicated	4	5	7	5	0	0	14	7

Testing Added

Each of the laboratory types compared added tests at a higher rate in 1997-1999. The same patterns are present in both studies, with hospital and independent laboratories adding tests more frequently than POLs. More rural laboratories and more large laboratories added tests than urban laboratories and small laboratories, respectively. The reasons for adding tests are similar between the two studies. (Tables 15 and 16)

Table 15 - Laboratories that added testing

	Percent of labs								
	All	**POL**	**Hospital**	**Independent**		**Urban**	**Rural**		**Annual test volumes**
									<10,000	>10,000
94-96	39	24	70	47		33	53		20	56
97-99	54	41	82	52		46	65		34	71

Table 16 - Reasons for adding tests

	1994-1996	1997-1999
Top primary reasons	For optimal patient management 22% To meet community needs 19% Better quality of kits/instruments 13%	For optimal patient management 21% To meet community needs 14% Better quality of kits/instruments 12%
Top secondary reasons	Patient convenience is enhanced 13% Patient outcome is improved 12% To meet community needs 11%	Patient convenience is enhanced 14% Patient outcome is improved 12% To meet community needs 12%

Between 1994-1996, 5% of laboratories added waived tests. In 1997-1999, this increased to 35%. (Table 17)

Table 17 - Tests added

	1994-1996	1997-1999
Top chemistry tests	routine chemistries and profiles thyroid testing therapeutic drugs drugs of abuse	routine chemistries and profiles troponin and other cardiac markers thyroid testing
Top microbiology tests	Clostridium difficile Chlamydia urine cultures	Clostridium difficile Chlamydia other cultures H.pylori (CLO, antigen tests)
Top immunology tests	H.pylori antibody hepatitis HIV	H.pylori antibody prostate specific antigen hepatitis HIV
Top hematology tests	hemoglobin A1C coagulation complete blood counts reticulocyte counts	hemoglobin A1C coagulation
Waived tests	3 tests added pregnancy test glucose erythrocyte sedimentation rate	66 tests added H.pylori antibody Strep antigen microalbumin mononucleosis hemoglobin A1C

We also evaluated the patterns of changes in the subset of laboratories that answered both Questionnaire 3 and Questionnaire 11. Although a higher proportion of these 112 laboratories are located in Washington (89%) and in urban areas (67%) than all laboratories that responded to Questionnaire 11, their patterns of test volume and test menu changes were very similar to those found from all laboratories that answered Questionnaire 3 and all that answered Questionnaire 11.

CONCLUSIONS

We explored a wide range of factors having an influence on test volumes and test menu changes between 1997 and 1999. As in our previous study, we still find that these changes are primarily due to practice changes and marketplace influences, with laboratory regulations and managed care contracts playing minor roles.

POLs showed an improvement in their on-site testing capabilities since our last study. Only 15% had a decrease in test volumes between 1997 and 1999 and a significantly lower percentage of POLs discontinued tests and a significantly higher percentage added tests since the 1994-1996 study.

We find that laboratories are embracing the availability of a wide variety of waived tests - 68% of the laboratories that added waived tests were POLs.

Troponin has emerged as a new favorite and H.pylori testing continues to be popular, showing up as waived and moderate complexity antibody tests, as well as CLO tests and antigen methodologies.

Short term trends in test volume and test menu changes appear to be the very similar to the long term trends.