# The Pacific Northwest Laboratory Medicine Sentinel Monitoring Network
# Final Report of the Findings of Questionnaire 14
# Utilization of Referral Laboratory Services

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## BACKGROUND

The Pacific Northwest Laboratory Medicine Sentinel Monitoring Network was created in 1995 to gather ongoing information about practices in hospital, independent and physician office laboratories in Washington, Oregon, Idaho and Alaska. To date, 16 questionnaires have been released to the network, exploring issues related to: testing quality; access to testing services; laboratory-related problems and errors; personnel training and changes; proficiency testing participation; point of care testing; and waived testing.

[Final reports of the findings of each questionnaire and references to published journal articles can be found on the Centers for Disease Control and Prevention (CDC) Website: http://www.phppo.cdc.gov/dls/mlp/pnlmsmn/asp]

**Questionnaire 14**

The intent of this questionnaire was to determine how clinical testing sites interact with reference laboratories and the frequency and type of problems they encounter with send-out testing. By characterizing our network laboratories' utilization patterns with their reference laboratories and their problems or concerns with referral laboratory services, the providers of reference laboratory testing may recognize opportunities for improving their provision of these services. In addition, the network laboratories may use this information to develop activities to track the quality of their send out testing.

Questionnaire 14 was mailed to 381 laboratories in June 2000. Two hundred fifty-seven laboratories returned a completed questionnaire in time for analysis, a 68% response rate. Demographic characteristics of the respondents are summarized in Table 1.

**Table 1 - Demographic characteristics of respondents (N=257)**

| **Demographic characteristic** | **Percent of laboratories** |
|---|---|
| STATE | |
| Washington | 53 |
| Idaho | 20 |
| Oregon | 18 |
| Alaska | 9 |
| CENSUS BUREAU DESIGNATION | |
| Urban | 56 |
| Rural | 44 |
| LABORATORY TYPE | |
| Physician office * | 63 |
| Hospital | 27 |
| Independent | 10 |
| ANNUAL TEST VOLUME | |
| <2000 | 20 |
| 2000 to 10000 | 27 |
| 10001 to 25000 | 12 |
| 25001 to 50000 | 9 |
| 50001 to 75000 | 5 |
| 75001 to 100000 | 6 |
| >100000 | 21 |
| *Includes: physician office laboratories (POLs), clinics, community health centers, rural health centers, health departments/districts, student health centers and health maintenance organizations (HMOs). | |

## FINDINGS

**Number of reference laboratories used**

Participants were asked "How many different reference laboratories do you use for your send out tests?" The network respondents used an average of 2.7 reference laboratories, with a range of 0 to 17. The average for POLs was 2.2, for hospital laboratories 3.2, and for independent laboratories 4.3.

**Primary reference laboratory**

Participants were asked for the type of reference laboratory they used for the majority of their send-out tests and the distance of that reference laboratory from their facility. Overall, 64% of the network respondents used an independent laboratory for the majority of their send-out tests, and nearly half of them (49%) sent the work more than 100 miles away.

Twenty-nine percent sent their referral work to a hospital or hospital-based independent laboratory. Eighty-four percent of the respondents using these types of reference laboratories sent the work less than 25 miles away.

Overall, approximately one-third of the respondents (32%) sent their work to reference laboratories within 10 miles of their facility, and another third (35%) sent their referral work more than 100 miles away.

Forty-four percent of POLs use hospitals and clinics as their primary reference laboratory and 47% of POLs are within 10 miles of the referral laboratory. Eighty-six percent of hospitals and 73% of independent laboratories use independent laboratories as their primary reference laboratory. Fifty-nine percent of hospitals and 54% of independent laboratories are located more than 100 miles from the referral laboratory.

Tables 2, 3 and 4 summarize the types of reference laboratories used and the distances from our network respondents.

**Table 2 - Type of primary reference laboratory used**

| Type of reference laboratory used | Percent of respondents | | | |
|---|---|---|---|---|
| | Network laboratory type | | | |
| | All | POL | Hospital | Independent |
| Independent | 64 | 53 | 86 | 73 |
| Hospital | 21 | 29 | 9 | 8 |
| Hospital-based independent | 8 | 10 | 3 | 8 |
| Clinic | 4 | 5 | 1 | 0 |
| Other* | 3 | 3 | 0 | 12 |
| *Includes: State health department; CDC; joint outreach hospital and independent laboratory; CDC-approved lipid reference laboratory; licensed blood center. | | | | |

**Table 3 - Primary reference laboratory**

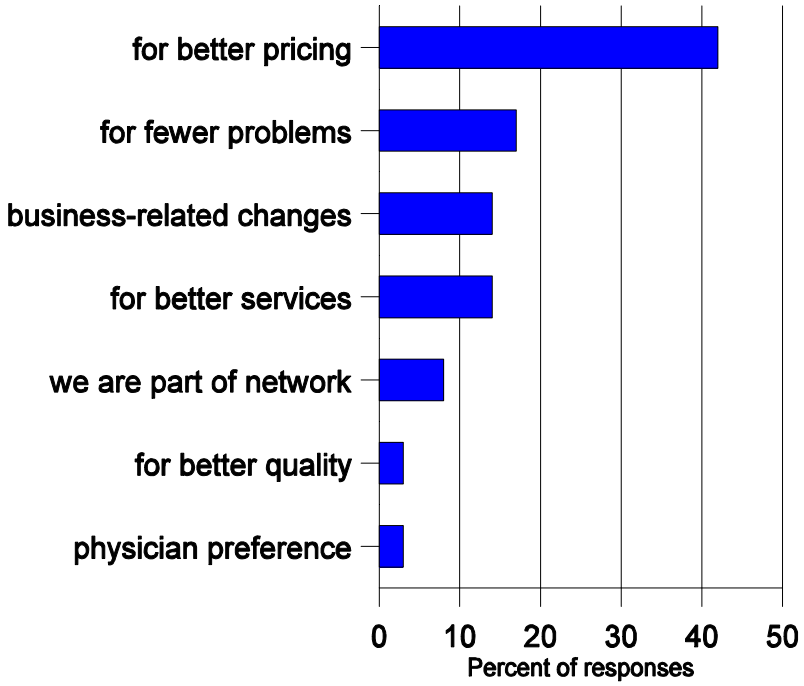
| Distance to reference laboratory (miles) | Percent of respondents using as their primary reference laboratory: | | |
|---|---|---|---|
| | Independent (N=162) | Hospital/hospital-based independent (N=73) | Clinic (N=9) |
| <10 | 14 | 69 | 56 |
| 11 to 25 | 12 | 15 | 22 |
| 26 to 50 | 11 | 5 | 0 |
| 51 to 100 | 15 | 5 | 22 |
| >100 | 49 | 5 | 0 |

**Table 4 - Primary reference laboratory**

| Type of respondent laboratory | Distance to reference laboratory (miles) | | | | |
|---|---|---|---|---|---|
| | <10 | 11 to 25 | 26 to 50 | 51 to 100 | >100 |
| | Percent of respondents | | | | |
| All | 32 | 13 | 9 | 12 | 35 |
| POL | 47 | 14 | 9 | 9 | 21 |
| Hospital | 1 | 10 | 10 | 20 | 59 |
| Independent | 19 | 15 | 4 | 8 | 54 |
| Urban | 47 | 20 | 9 | 3 | 20 |
| Rural | 12 | 4 | 8 | 22 | 54 |
| Alaska | 13 | 0 | 0 | 0 | 87 |
| Idaho | 18 | 12 | 8 | 20 | 42 |
| Oregon | 40 | 17 | 9 | 11 | 23 |
| Washington | 37 | 15 | 10 | 11 | 27 |

Participants were asked “In the past 2 years, have you changed your primary reference laboratory?” Fourteen percent of respondents stated they had changed to another laboratory for the majority of their send-out testing. The most common reasons given were: For better pricing (42%); for fewer problems (17%); because of business-related changes [change of ownership; joined hospital purchasing contract; laboratories in area incorporated] (14%); and for better services [courier, printer, turnaround times, customer service] (14%). Figure 1 shows all the responses given.

**Figure 1 - Reasons for changing reference laboratories (N=36 laboratories)**




**Phone calls to reference laboratories**

Using a list of 12 reasons, participants were asked to indicate the frequency with which they call their reference laboratories. If there were reasons not listed, they could describe them under "Other."

For each respondent laboratory, we ranked their range of responses in order of frequency, with 1= their highest frequency, 2= second highest frequency, etc. (For example, for laboratories whose range of frequencies for various reasons was daily to yearly, all the responses given as "daily" were ranked as 1; all responses they gave as "weekly" were ranked as 2, etc. For laboratories, whose range of frequencies for various reasons was once per month to once per 6 months, all responses given as "once per month" were ranked as 1; all responses given as "once per 3 months" were ranked as 2, etc.)

For each of the reasons for calling a reference laboratory, we tallied the total number of laboratories whose relative frequency ranking was a 1 or 2. Table 5 shows the reasons in order of the highest to the lowest number of laboratories with these high relative frequency rankings. Table 5 also shows a summary of the actual frequencies for each reason.

The most frequent reasons to call the reference laboratory were: To add a test to an existing specimen; to obtain test results before they were promised or because there were delayed; and to

obtain advice on how to properly submit a specimen for testing or find out which test was the correct one to order.

The least frequent reason to call the reference laboratory was to obtain assistance in the interpretation of test results. Phone calls related to problems by the reference laboratory or by the site sending the specimen were relatively infrequent - ranking 9th and 10th on the list of 12 reasons.

A relatively large percentage of laboratories said they never call to order tests (because they do so using a form or electronically) and never call for a courier pick up (because they are on an established pick up schedule).

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**Table 5 - Reasons for calling reference laboratories**

| **Reason for calling reference laboratory** | **# labs with 1st or 2nd frequency** | Percent of labs that call reference laboratory at least once per: | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **day** | **week** | **month** | **3 months** | **6 months** | **year** | **never** |
| To add a test to an existing specimen | 213 | 18 | 44 | 22 | 7 | 4 | 2 | 4 |
| To get patient results before the expected reporting time | 194 | 12 | 41 | 23 | 6 | 5 | 3 | 10 |
| To get patient results because they are delayed | 174 | 9 | 33 | 28 | 13 | 5 | 2 | 10 |
| To ask about test specimen requirement or handling | 163 | 9 | 32 | 25 | 13 | 9 | 4 | 7 |
| To ask about the correct test to order | 158 | 8 | 27 | 25 | 16 | 8 | 5 | 10 |
| To order testing | 133 | 13 | 25 | 14 | 6 | 3 | 2 | 36 |
| To ask about test prices or billing codes | 120 | 5 | 23 | 25 | 16 | 8 | 7 | 16 |
| To get a courier pickup | 97 | 11 | 16 | 14 | 7 | 4 | 6 | 42 |
| Because of problems by the reference laboratory | 89 | 4 | 12 | 24 | 19 | 12 | 12 | 16 |
| To relay information about an error we made in specimen submission | 80 | 3 | 11 | 22 | 22 | 16 | 16 | 11 |
| To ask about billing issues | 76 | 3 | 10 | 25 | 20 | 12 | 10 | 20 |
| To get assistance interpreting test results | 33 | 1 | 4 | 18 | 20 | 19 | 16 | 23 |

**Problems with reference laboratories**

Using a list of 22 problems, participants were asked to rank their top three most frequent problems or concerns they have had with their reference laboratory. If they had other concerns or problems not listed, they could describe those under "Other."

A total of 605 responses were given. The most frequent individual problems related to: Turnaround times for results were too long; the reference laboratory did not run all tests ordered; specimens were compromised; and errors in billing.

When individual problems were combined into categories of interest, specimen handling and processing problems were most frequent (29% of all problems given), followed by problems related to reporting of test results (25%).

The following summarizes all the responses given for the top three most common problems.

| | Number | Percent |
|---|---|---|
| **Specimen handling, processing** | **176** | **29** |
| Did not run all tests ordered | 63 | 10 |
| Specimen compromised | 56 | 9 |
| Specimen lost | 44 | 7 |
| Other: | 13 | 2 |
| Canceled without notification | | |
| Specimen breaks or quantity not sufficient (QNS) | | |
| Not properly handled | | |
| They use "specimen leaked in transit" for inter-lab problems | | |
| **Reporting results** | **152** | **25** |
| Turnaround times are too long | 71 | 12 |
| Critical values are not called | 19 | 3 |
| Do not have enough information to interpret results | 17 | 3 |
| Reports are difficult to understand | 10 | 2 |
| Results are not available as promised | 10 | 2 |
| Results are questionable or incorrect | 6 | 1 |
| Other: | 19 | 3 |
| Entry error on demographics | | |
| Report never sent to the office | | |
| Report not delivered promptly via computer | | |
| STAT results are not very STAT | | |
| Computer interface is difficult | | |

| **Billing issues** | **101** | **17** |
|---|---|---|
| Billing errors | 50 | 8 |
| Patient cannot understand bill | 27 | 4 |
| Delays in sending out bills | 12 | 2 |
| Other: | 12 | 2 |
| Asking for ICD-9 codes when we provided them | | |
| Medicare coding rules change, have to guess | | |
| Chemistry panels change to match what Medicare pays | | |
| Have to provide diagnosis codes | | |
| **Courier services** | **66** | **11** |
| Long delay in delivery of specimens to lab | 23 | 4 |
| Specimens not picked up as promised | 15 | 2 |
| Specimens not picked up often enough | 12 | 2 |
| Lab will not pick up specimens on demand | 9 | 1 |
| Other: | 7 | 1 |
| Took wrong specimen | | |
| Will not offer courier service | | |
| Delay in pick up of STATs | | |
| Post office not getting sample to lab pick up | | |
| **Customer services** | **65** | **11** |
| Cannot reach someone for help | 32 | 5 |
| Staff is not knowledgeable | 18 | 3 |
| Staff is not helpful | 6 | 1 |
| Other: | 9 | 1 |
| Get switched from person to person for information | | |
| On hold for customer service representative | | |
| **Test requisitions** | **23** | **4** |
| Requisitions are difficult to fill out | 10 | 2 |
| Requisitions are hard to understand | 6 | 1 |
| Problems with information provided to order tests | 5 | <1 |
| Other: | 2 | <1 |
| Test requisitions are not customized | | |
| We have to send written request on phoned orders | | |
| **Menu of available tests** | **16** | **3** |
| **Other** | **6** | **1** |
| Too much paperwork | | |
| Delay in delivery of supplies | | |
| Adequacy of supplies | | |

**Problem send-out tests**

Participants were asked to write the name of up to five tests or types of tests that they send to a reference laboratory, with which they have had the most problems and to describe the problem encountered.

A total of 384 problems were noted for 366 tests. Thirty-five of the 257 respondents (14%) did not record any tests or stated they had no problems.

A wide variety of tests were recorded, from very common to very exotic. The following tests were mentioned most frequently as problematic send-out tests:

- **Frozen specimens (52)**

- **Esoteric tests (41)**
  Because these are so unusual, they sometimes require the first reference laboratory to send to a second reference laboratory, further delaying testing and complicating the handling.
  Laboratories are confused about what to order and find result interpretation difficult.
  Specimen handling is difficult, resulting in compromised specimens.

- **Hepatitis and HIV tests (34)**
  There is confusion about what to order and what you will get (profile, panel, viral load, genotype, titer, quantitative, qualitative).
  Reflexive testing is confusing, tests that you expect to be added on don't get added on.
  Result interpretation is difficult.
  Sample stability can be problematic.

- **Cultures (27)**
  Turnaround times were a primary concern.
  Not receiving preliminary reports or final reports as expected.

- **PAP smears (20)**
  Turnaround times were a primary concern.
  Missing or delayed reports.

- **Coagulation tests (19)**
  Special handling is necessary, resulting in compromised specimens.
  Laboratories want results to be called.

- **Drug testing (13)**
  Turnaround times were a primary concern.

- **Prenatal testing (10)**
  Turnaround times were a primary concern.
  Not all tests were performed.
  Difficulty interpreting results.

Overall, the most frequent problems were: Turnaround times too long; compromised specimens; not having information to properly order tests; and not getting all tests or the correct test performed. When individual problems were combined according to categories of interest, specimen handling and test reporting issues ranked highest, each with 40% of all responses.

The following gives an overview of all responses, with specific examples of the types of tests and problems.

| **Specimen handling** | Number of responses<br>**152** | Percent<br>**40** | Examples |
|---|---|---|---|
| Compromised specimens | 66 | 17 | Samples requiring freezing-arriving thawed.<br>Samples requiring specialized handling: i.e., heavy metals, ionized calcium, 24 hour urines, coagulation testing. |
| Did not run all tests<br>Did not run correct test | 37 | 10 | Panels, screens, profiles, reflexive testing-tests performed are different from expected.<br>Lab does not hold specimen long enough to add on tests when discrepancy is discovered. |
| Lost specimen | 19 | 5 | Placed in wrong rack.<br>Sent to wrong lab section.<br>Sent to wrong lab.<br>Specimen leaked in transit. |
| Delays in testing | 18 | 5 | Too long in transport.<br>"Pass through" to second reference lab delays testing.<br>Sample delayed at post office-too old to test.<br>Specimens collected on Friday not processed until Monday.<br>Airline strike, specimen sat days in transit. |
| Handling requirements are very unusual or difficult | 12 | 3 | Acetyl receptor antibodies -have to split sample and send to several sites for testing.<br>Coagulation factors-3 separate tubes at -70 degrees C.<br>PTH intact with ionized calcium-1 tube frozen, 1tube not frozen-difficult keeping them together.<br>Somatostatin-getting correct additive. |

| **Reporting results** | Number<br>**152** | Percent<br>**40** | Examples |
|---|---|---|---|
| Turnaround times too long | 101 | 26 | Top tests: cultures, PAPs, drug testing, hepatitis testing |
| Results are delayed or lost | 17 | 4 | Top tests: PAPs, cultures |
| Concerns about accuracy | 15 | 4 | Reference lab doesn't recover organism that we do.<br>Original report doesn't match amended report.<br>Tests are inaccurate if not run immediately. |
| Difficulty interpreting results | 9 | 2 | Cannot interpret results tested at different labs. |
| Information about specimen in error | 5 | 1 | Not all information relayed by reference lab-cannot do necessary calculations.<br>Source of specimen not identified on culture report. |
| Information about patient in error | 4 | 1 | Patient name misspelled.<br>Improper input of demographics needed for interpretation. |
| Problems retrieving results | 1 | <1 | Can only retrieve results by patient name, if misspelled cannot find results. |

| **Ordering tests** | Number<br>**47** | Percent<br>**12** | Examples |
|---|---|---|---|
| Problems with the information provided to properly order test | 45 | 12 | Esoteric tests - i.e., C1 esterase, collagen panel, Factor V Leiden mutation, cytogenetics, flow cytometry, hepatitis testing.<br>Mixed messages on how to handle.<br>Don't know which test is needed.<br>Physicians don't know what to order.<br>Discrepancy in test booklet.<br>Specimen requirements change without notification.<br>Test directory information is obsolete. |
| Requisitions | 2 | <1 | Requisition is confusing. |

| | Number | Percent | Examples |
|---|---|---|---|
| **Billing/Cost issues** | **8** | **2** | We don't provide adequate ICD-9, diagnosis codes.<br>Lab charges wrong price.<br>Tests are expensive. |
| **Courier services** | **7** | **2** | Specimens not picked up.<br>Delays in specimen pick up.<br>No pick up services in PM-can only send in AM. |
| **Test performance** | **3** | **<1** | Test not done correctly. |
| **Customer service** | **2** | **<1** | Lab won't help us select correct test.<br>Staff not helpful. |
| **Other** | **13** | **3** | Have to send test to one lab, not available at most labs.<br>Not calling critical values. |

## DISCUSSION

The network respondents primarily interact with their reference laboratory to obtain patient test results and get advice on how to properly submit specimens and order the correct tests. Calls related to problems by the reference laboratory ranked relatively low.

When specifically asked about problems occurring with send-out testing, turnaround time was the primary concern, ranking as a top reason to call the referral laboratory and as a top problem overall. Compromised specimens were also a top concern, with specimens requiring freezing being mentioned most frequently. With 35% of laboratories using a reference laboratory located more than 100 miles away, these concerns about compromised specimens are not surprising. Having to rely on airline companies and the postal service to transport samples contributes to this problem.

Respondents also expressed concerns with the accuracy and availability of information provided by referral laboratories to assist in ordering the proper test. This relates closely to another common problem of not getting all tests or the correct test performed. In some cases, the terminology is confusing or not well explained and a profile or panel or screen may include different tests at different testing sites. In other cases, the test menu and information may not be updated often enough and may be inaccurate or obsolete. The problem may be further compounded if the reference laboratory does not hold the specimen long enough to add on tests, once discrepancies are discovered.

Network laboratories were bothered with billing errors and having to provide International Classification of Diseases, 9th Edition (ICD-9) codes (diagnosis codes) on the requisition forms. In this instance, the reference laboratory may be blamed for billing-related problems that actually stem from a cumbersome system and requirements set by government agencies and insurance companies for obtaining reimbursement for laboratory services.

Concerns about the accuracy of test results were low.