2012

State Census of Oregon

Clinical Labs

Prepared for the Oregon Health Information Technology Oversight Council (HITOC)

Released: August 5, 2012

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EXECUTIVE SUMMARY

Our census found that just over half of the Oregon hospital and independent laboratories that responded to the census currently send structured electronic results to providers. Of concern, however, is the limited use and awareness of existing standards (HL7, LOINC) and recent practices for electronic result exchange from the Standards and Interoperability Framework working groups.

We interpret this census to suggest that our laboratories' capabilities for standardized exchange of test results in Oregon are not yet sufficient to provide standards-based electronic structured reports to all providers who need them – especially those practicing outside of large health systems. This finding raises concerns that clinical laboratory data needed for effective use of electronic health records and cross-organizational information exchange may constrain adoption and meaningful use by independent Oregon providers.

INTRODUCTION

This census of the electronic reporting capabilities of hospital and independent clinical laboratories in Oregon was requested by the Office of the National Coordinator for Health IT (ONC) in a Program Information Notice (ONC PIN-HIE-002). In the notice, the ONC asked states granted a State HIE Cooperative Agreement: "to track the progress of their health information exchange-enabling efforts in key priority areas." One of these priority areas is electronic exchange of structured laboratory data.

To collect and analyze this information, Oregon's Office of Health Information Technology requested a lab census focusing, per ONC request, on the "percent of labs sending electronic lab results to providers in a structured format", and the “percent of labs sending results using LOINC codes.”

We also took the opportunity to learn more about: how hospital and independent labs in our state distribute their test reports (on paper, fax, or electronically); relative test volumes; and firsthand demographic information for later use in our outreach and education efforts.

In this report, we describe the methods and results of the Oregon state lab census conducted between March and June, 2012. We discuss the implications of these data for providers wishing to receive structured electronic results, and briefly compare these results with our first lab survey conducted in May of 2011.

METHODS

To describe the current capabilities of Oregon labs to send structured electronic test results, we mailed questionnaires to 108 hospital and 71 independent labs. Per ONC recommendations (*Conducting a state census of clinical labs*, ONC 2012) our recipients were drawn from the Online Survey, Certification and Reporting database (OSCAR) maintained by the Center for Medicare and Medicaid Services in compliance with the Clinical Laboratory Improvement Act (CLIA). Out of 2,526 CLIA registered laboratories (Appendix B), we selected

those identified as hospital and independent labs (179) as the major sources of laboratory data in the state.

Census data were collected on two paper questionnaires: one for hospital and one for independent labs (see Appendix C1 and C2). We based our questions on the census examples provided in the May ONC Guidance. The mailings were professionally printed on Oregon State letterhead, and mailed with a cover letter from our state's coordinator of Health IT (Carol Robinson) on April 9, 2012. A local Health IT graduate student was recruited to assist with the planning, delivery, and analysis of the census.

In addition to mailing the questionnaires, we designed an online survey form using Survey Monkey (www.SurveyMonkey.com). This form and database served two purposes: first, our research assistant used the website to enter and validate returned paper questionnaires and second, we wanted to have an electronic option available to our recipients.

We tried to maximize our response rate in three ways: first, by providing a "hotline" with access to our subject matter expert; second, by conducting telephone reminders; and third, by targeting key laboratory contacts known to the research team. We had no calls to our hotline, and over seventy hours were spent attempting to contact non-responders by phone or email.

Our data were analyzed from the Survey Monkey database, which was downloaded, reformatted, and reviewed as a Microsoft Excel spreadsheet. For each laboratory that responded, we collected basic demographics, yes/no responses, numeric ranges, and free-text "other" responses.

We did not attempt statistical analyses beyond totals and response frequencies, choosing to handle this project as a census and not a formal scientific survey. We also lacked enough information on the recipients to conduct a meaningful comparison of responders versus non-responders.

After tabulating the responses, our team reviewed the results looking for patterns, trends, and anomalies. We attempted to verify any inconsistent responses with the recipient by phone or email. A draft of this report was distributed to a selected group of laboratory stakeholders for comments before being reviewed by HITOC.

As a check on validity, we informally compared the findings from a similar lab survey we conducted in May 2011, and present this comparison in the results section below.

RESULTS

Data for the results below were collected from two census forms (see Appendix C1 and C2), one for hospitals and one for independent labs. Because not all questions were answered by all respondents, we present the numerator and denominators (nn/nn) along with the percentages where appropriate. Please see the tables in the Appendix A for a complete tabulation.

From a total of 179 Oregon hospital and independent laboratories listed in the OSCAR database, we received responses from 44/108 (41%) and 8/71 (11%) respectively. Our total response rate was 52/179 (29%). Of that total, 14 labs completed the census online, 33 mailed their response, and six provided answers over the phone during a reminder call.

The majority of hospital labs (36/44) are affiliated with hospitals or health systems versus either academic medical centers (2/44) or "other" (6/44). Of the independent labs, only one response out of eight represented an in-state affiliate of a national laboratory.

Most of the hospital labs reported volumes of less than 100,000 billable tests per year (22/44), followed by up to 1 million billable tests (17/44), and only five laboratories with over 1 million (5/44). Of the independent labs, most were small (5/8 under 100,000 billable tests), and two reported over 1 million tests.

About half of the responding (23/44) hospitals and independent labs (4/8) reported that they currently send structured electronic test results to ambulatory providers -- either within or

outside of their organizations. Of the hospital labs, 91% (21/23) send electronic results outside of their organization, one does not, and one was unsure.

Provider access to lab results through a web portal is provided by less than half of the hospital labs (12/22) and three of four of the responding independent labs (one did not know).

Only two hospitals and one independent lab say they are using the LRI implementation guide from the S&I Framework. The vast majority did not use the S&I framework (24/44, hospitals; 4/7 independent) or did know (18/44, hospitals; 2/7, independent).

Less than half of the hospital (16/42) and independent labs (3/7) currently support HL7 2.3x; version 2.5.1 is supported by 17% (7/42) and 43% (3/7) respectively. None reported using Clinical Documents (CDA, CCD, etc.) for reporting electronic test results.

Finally, 16% (7/44) of hospitals and 25% (2/8) of independent labs reported using LOINC codes to identify lab tests; the rest did not or were unsure.

DISCUSSION

This census provides an important measure of the current electronic reporting capabilities of a small proportion of Oregon laboratories. Our response rate remained fairly low (a total of 29%), despite our use of a professional mailing and considerable resources devoted to telephone follow-up with non-responders.

The present results are consistent with a similar survey we conducted in May, 2011, which also used CLIA labs as a source of recipients. In 2011, with a 29% response rate we found that 41% (12/26) of labs electronically reported results to outside providers, 38% (10/26) offered web portals, 46% (10/22) used HL7 2.3, 46% (10/22) HL7 2.5.1, and 58% (11/19) identified tests with LOINC codes.

CONCLUSION

Our census found that just over half of the hospital and independent laboratories currently send structured electronic results to providers. Of concern, however, is the limited use and awareness of existing standards (HL7, LOINC) and best practices for electronic result exchange (S&I).

We interpret this census to suggest that our hospital and independent laboratories' capabilities for standardized exchange of test results in Oregon are not yet sufficient to provide electronic structured reports to all providers who want them. This finding raises concerns that clinical laboratory data needed for effective use of electronic health records and cross-organizational information exchange may constrain Oregon providers' ability to demonstrate Meaningful Use.

LIMITATIONS

Our census has several limitations. First, the census was limited to hospital and independent labs, self-identified in the OSCAR database. This excludes other sources of lab data, including ambulatory clinics and group practices.

Second, we lacked responses from three large independent laboratories with sizeable markets in Oregon: LabCorp, Quest Diagnostics, and PAML (Spokane, WA).

Third, many multi-site organizations have multiple CLIA registrations. We opted not to attempt to adjust the reported proportions, leading to some over-reporting by large health system labs receiving more than one questionnaire.

Finally, it is possible that the person completing the questionnaire for their organization may not have been aware of the technical details of their result delivery. Future studies may require contacts outside of the laboratory to ensure a complete and accurate landscape.

ACKNOWLEDGMENTS

We would like to thank our laboratory stakeholders group, Oregon HITOC, the Oregon Health Authority, and the OHA Shared services for their support in planning, distributing and completing this census.

DISCLOSURE

This report was prepared under State contract by Dave Witter and Associates in association with The Robertson Group LLC.

REVISIONS:

September 6, 2012 (JM): Corrected response rate for independent labs to 11.3%.

APPENDICES

A. 2012 Lab Census Data Tables

Forty-four Hospital and eight independent labs responded to a specific census form and are analyzed separately. Some questions were skipped by recipients, and we report both the actual responses along with the percentage (Responses (%)).

A1. Census response rate

	Responses	Total Recipients	Response Rate
Independent Labs	8	71	11.27%
Hospital Labs	44	108	40.70%
All labs	52	179	29.10%

A2. Laboratory ownership or organizational affiliation

Organizational Affiliation or Ownership	Independent Labs
Independently Owned	5 (62.5%)
Clinic or Group Practice	2 (25%)
Affiliated with National Lab	1 (12.5%)
Other	0
Total Responses	8

Organizational Affiliation or Ownership	Hospital Labs
Affiliated with a University/Academic Center	2 (4.5%)
Hospital or Health System	36 (81.8%)
Non-academic affiliated laboratory	6 (13.6%)
Other	3 (6.8%)
Total Responses	44

A3. Billable tests per year received from ambulatory providers

Billable Tests per Year	Independent Labs	Hospital Labs
Fewer than 100,000 billable tests	5 (62.5%)	22 (50%)
100,000 - 499,999 billable tests	1 (12.5%)	13 (29.5%0
500,000 - 999,999 billable tests	0	4 (9.1%)
1,000,000 or more billable tests	2 (25%)	5 (11.4%)
Total Responses	8	44

A4. Currently send electronic lab results

Send electronic results	Independent Labs	Hospital Labs
Yes	4 (50%)	23 (52.3%)
No	3 (37.5%)	21 (47.7%)
Don't Know	1 (12.5%)	0
Total Responses	8	44

A5. Currently deliver electronic lab results to outside providers: Independent Labs

Independent Labs	None	Some or all	Unknown	Total Responses
Electronic delivery to EHR	0	3 (75%)	1 (25%)	4
Available on web portal	0	3 (75%)	1 (25%)	4
Other method	0	0	1 (100%)	1

Hospital Labs	None	Some or all	Unknown	Total Responses
Electronic delivery to EHR	1 (4.3%)	21 (91.3%)	1 (4.3%)	23
Available on web portal	8 (36.4%)	12 (54.5%)	2 (9.1%)	22
Other method	2 (33.3)	4 (66.7%)	0	6

A7. Currently use LOINC codes to identify lab tests

Use LOINC	None	Some or all	Unknown	Total Responses
Independent Labs	4 (50%)	2 (25%)	2 (25%)	8
Hospital Labs	27 (61.4%)	7 (15.9%)	10 (22.7)	44

A8. Have used the LRI Implementation Guide (S&I Framework)

Use LRI (S&I Framework)	Independent Labs	Hospital Labs
Yes	1 (14.4%)	2 (4.5%)
No	4 (57.0%)	24 (54.5%)
Don't Know	2 (28.6%)	18 (40.9%)
Total responses	7	44

A9. HL7 Standards currently in use

Independent Labs	**Yes**	**No**	**Unknown**	**Total Responses**
HL7 2.3.1	3 (42.9%)	2 (28.6%)	2 (28.6%)	7
HL7 2.5.1	3 (42.9%)	3 (42.9%)	1 (14.3%)	7
Other	0	1 (100%)	0	1

Hospital Labs	**Yes**	**No**	**Unknown**	**Total Responses**
HL7 2.3.1	16 (38.1%)	9 (21.4%)	17 (40.5%)	42
HL7 2.5.1	7 (16.7%)	17 (40.5%)	18 (42.9%)	42
Other	5 (28.4%)	3 (17.6%)	9 (52.9%)	17

B. CLIA Labs in Oregon (OSCAR, 4-2012)

Oregon registered labs (CLIA)	Total
Ambulance	69
Ambulatory surgery center	64
Ancillary test site	32
Assisted living facility	31
Blood banks	4
Community clinic	101
Comprehensive outpatient rehab	7
End stage renal disease dialysis	51
Federally qualified health center	16
Health fair	18
Health Maintenance Organization	6
Home health agency	52
Hospice	15
Hospital	94
Independent	96
Industrial	7
Mobile lab	59
Other	237
Other practitioner	74
Pharmacy	98
Physician office	1188
Prison	6
Public health laboratory	17
Rural health care clinic	21
School/student health service	26
Skilled nursing/nursing facility	135
Tissue bank/repositories	2
Grand total	**2526**

Source: CLIA OSCAR database (retrieved March, 2012 from http://www.cdc.gov/CLIA/labdemos.aspx)

C. 2012 Census Cover Letter and Questionnaire

OHA SHARED SERVICES
Office of Health Information Technology

John A. Kitzhaber, MD, Governor

Oregon Health Authority

500 Summer Street NE, E-52
Salem, OR 97301

April 4, 2012

Attn: Variable data addresses here
Facility Name
Address
City, State, Zip

Dear Laboratory Manager or Director,

The Oregon Health Authority's Office of Health Information Technology is requesting your help to assess Oregon's current capabilities for health information exchange by completing the enclosed survey.

Exchanging electronically structured laboratory results is a high priority for state efforts to make health information exchange available to all authorized providers. The Office of the National Coordinator for Health Information Technology (ONC) has asked states to prioritize the exchange of electronic laboratory results and supports the distribution of this survey.

The goal of this survey is to provide Oregon's Office of Health IT with baseline data of the current capabilities of Oregon hospitals and independent clinical laboratories to send electronic test results to recipients outside of their organizations.

Gathering and monitoring these metrics is important for the Office of Health IT to support and measure the expanded delivery of electronic test results in communities across Oregon. Laboratories, such as yours, play a key role in facilitating health information exchange in Oregon.

We ask for your participation by completing this survey, and we hope that you will stay up-to-date on the ongoing efforts to facilitate health information exchange in Oregon.

Should you have any questions about the survey, options for electronic laboratory reporting, or Oregon's strategy for health information exchange, please feel free to contact us at 503-373-7859 or visit our website at **www.healthIT.oregon.gov**.

Sincerely,

Carol Robinson
Administrator, Oregon Office of Health Information Technology
Oregon State Coordinator, Health Information Technology
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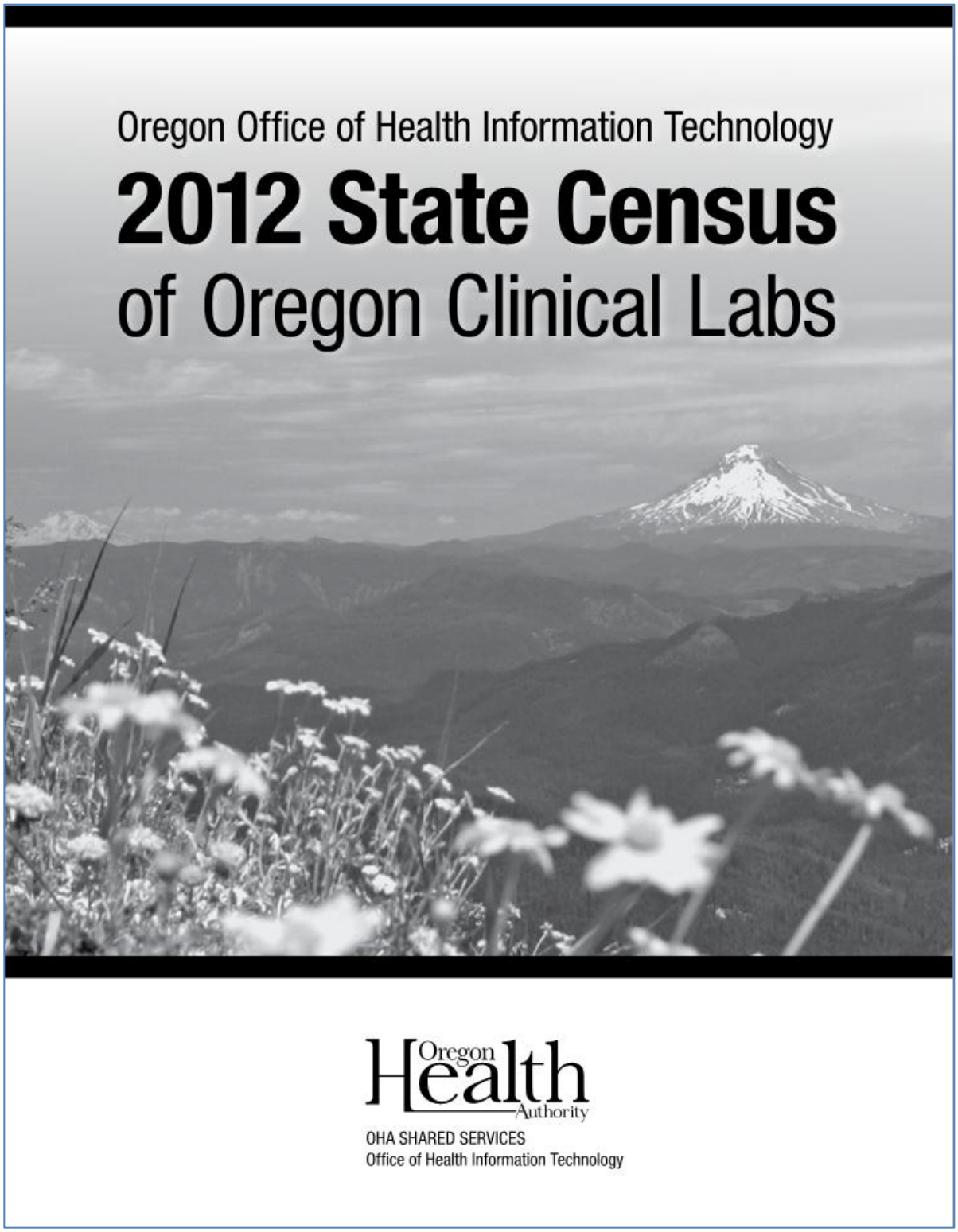
503-373-1817
503-856-6662 (Cell)

NOTE: This survey can also be completed online by going to **www.surveymonkey.com/s/ORLabsCensus1**. When prompted please enter the following five-digit survey number: <<Survey Tracking Number>>.

C1. Cover Sheet



C2.Hospital Lab Census Form

State Census of Oregon Clinical Labs

Name of person completing survey _____

Role/title of person completing survey _____

E-mail: _____

Name of lab _____

Other organization name (if appropriate) _____

City _____

Zip code _____

1. Which option below best describes your laboratory's organizational affiliation or ownership?
   - ❑ Affiliated with a University/Academic Center
   - ❑ Hospital or Health System
   - ❑ Non-academic affiliated laboratory
   - ❑ Other *(please specify)* _____

2. Please estimate the total of ALL billable tests your laboratory received from ambulatory providers during calendar year 2011 (that is, from January 1, 2011 to December 31, 2011).
   - ❑ Fewer than 100,000 billable tests
   - ❑ 100,000 – 499,999 billable tests
   - ❑ 500,000 – 999,999 billable tests
   - ❑ 1,000,000 or more billable tests
   - ❑ Other *(please specify)* _____

We would like to learn about your laboratory's current practices regarding exchange of lab results electronically, and use of structured formats.

- By "electronically" we mean any computerized exchange typically transmitted over the internet or through a network, using health information technologies such as electronic health records and direct access via a lab portal. Please do not include fax machines.
- By "structured format" we mean documentation of results using computer readable formats with predefined vocabulary that creates fixed fields within a record or file.

3. During calendar year 2011, did your laboratory **send** lab **results** to ambulatory providers **outside your organization electronically** in a **structured format**? *Do not include fax machines.*

   ❑ Yes ❑ No ❑ Don't know

4. If your laboratory **sent** structured results to ambulatory providers **outside your organization electronically** in 2011, please estimate the proportion of final lab results sent to Electronic Health Records (EHRs) and web portals.

   Please check no more than one box per row. Percentages may add up to more than 100%

Method	**0%**	**1-24%**	**25-49%**	**50-74%**	**75-99%**	**100%**	**Don't know**
Electronic delivery to Electronic Health Record (EHR)	❑	❑	❑	❑	❑	❑	❑
Available on web portal	❑	❑	❑	❑	❑	❑	❑
Other *(please specify)*	❑	❑	❑	❑	❑	❑	❑

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_____

We would like to learn about your laboratory's practices on standardization of lab results. In the following question, we will refer to "LOINC". LOINC (Logical Observation Identifiers Names and Codes) is a terminology used to provide consistent naming of datasets that includes standard codes for lab test names; for example, "Test name: Salmonella Stool Culture LOINC Code: 20955-1."

5. Please estimate the proportion of test results that your laboratory sent to ambulatory providers **outside** your organization following LOINC standards. Consider only results sent during calendar year 2011.

	0%	**1-24%**	**25-49%**	**50-74%**	**75-99%**	**100%**	**Don't know**
LOINC	❑	❑	❑	❑	❑	❑	❑

In the following question we will refer to the "LRI guide." The "LRI guide" is the implementation guide developed by the Office of the National Coordinator (ONC's)Standards and Interoperability Framework lab results interface (LRI) initiative.

6. Has your laboratory implemented the LRI guide for lab result content and format? (For more information about the S&I Framework initiatives, including the LRI initiative, visit **http://www.siframework.org/initiatives_wiki.html**)

   ❑ Yes ❑ No ❑ Don't know

In the following question, we will refer to "HL7." HL7 (Health Level 7) is a messaging standard that can be used to send lab results from a laboratory to an Electronic Health Record.

7. Please indicate which of the following Health Level 7 (HL7) message standards are currently used by your organization to send lab results to ambulatory care providers.

	Yes	**No**	**Don't know**
HL7 2.3.1	❑	❑	❑
HL7 2.5.1	❑	❑	❑
Other *(please specify)*	❑	❑	❑

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C2. Independent Lab Census Form

State Census of Oregon Clinical Labs:

Name of person completing survey _____

Role/title of person completing survey _____

E-mail: _____

Name of lab _____

Other organization name (if appropriate) _____

City _____

Zip code _____

1. Which option below best describes your laboratory's organizational affiliation or ownership?
   - ❑ Affiliated with a University/Academic Center
   - ❑ Clinic or Group Practice
   - ❑ Health System
   - ❑ Laboratory Corporation of America (LabCorp)
   - ❑ Quest Diagnostics
   - ❑ Other *(please specify)*_____

2. Which of the following best describes your laboratory type?
   - ❑ Independent/Commercial laboratory
   - ❑ Reference laboratory
   - ❑ Other *(please specify)*_____

3. Please estimate the total of ALL billable tests your laboratory received from ambulatory providers during calendar year 2011 (that is, from January 1, 2011 to December 31, 2011).
   - ❑ Fewer than 100,000 billable tests
   - ❑ 100,000 – 499,999 billable tests
   - ❑ 500,000 – 999,999 billable tests
   - ❑ 1,000,000 or more billable tests

We would like to learn about your laboratory's current practices regarding exchange of lab results electronically, and use of structured formats.

- By "electronically" we mean any computerized exchange typically transmitted over the internet or through a network, using health information technologies such as electronic health records and direct access via a lab portal. Please do not include fax machines.
- By "structured format" we mean documentation of results using computer readable formats with predefined vocabulary that creates fixed fields within a record or file.

4. During calendar year 2011, did your laboratory **send** lab **results** to ambulatory providers **electronically** in a **structured format**? *Do not include fax machines.*

   ❑ Yes ❑ No ❑ Don't know

5. If your laboratory **sent** structured results to ambulatory providers **electronically** in 2011, please estimate the proportion of final lab results sent to Electronic Health Records (EHRs) and web portals.

   Please check no more than one box per row. Percentages may add up to more than 100%

Method	**0%**	**1-24%**	**25-49%**	**50-74%**	**75-99%**	**100%**	**Don't know**
Electronic delivery to Electronic Health Record (EHR)	❑	❑	❑	❑	❑	❑	❑
Available on web portal	❑	❑	❑	❑	❑	❑	❑
Other *(please specify)*	❑	❑	❑	❑	❑	❑	❑

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We would like to learn about your laboratory's practices on standardization of lab results. In the following question, we will refer to "LOINC". LOINC (Logical Observation Identifiers Names and Codes) is a terminology used to provide consistent naming of datasets that includes standard codes for lab test names; for example, "Test name: Salmonella Stool Culture LOINC Code: 20955-1."

6. Please estimate the proportion of test results that your laboratory sent to ambulatory providers following LOINC standards. Consider only results sent during calendar year 2011.

	0%	**1-24%**	**25-49%**	**50-74%**	**75-99%**	**100%**	**Don't know**
LOINC	❑	❑	❑	❑	❑	❑	❑

In the following question we will refer to the "LRI guide." The "LRI guide" is the implementation guide developed by the Office of the National Coordinator (ONC's) Standards and Interoperability Framework lab results interface (LRI) initiative.

7. Has your laboratory implemented the LRI guide for lab result content and format? (For more information about the S&I Framework initiatives, including the LRI initiative, visit **http://www.siframework.org/initiatives_wiki.html**)

   ❑ Yes ❑ No ❑ Don't know

In the following question, we will refer to "HL7." HL7 (Health Level 7) is a messaging standard that can be used to send lab results from a laboratory to an Electronic Health Record.

8. Please indicate which of the following Health Level 7 (HL7) message standards are currently used by your organization to send lab results to ambulatory care providers.

	Yes	**No**	**Don't know**
HL7 2.3.1	❑	❑	❑
HL7 2.5.1	❑	❑	❑
Other *(please specify)*	❑	❑	❑

_____

_____