Clinical LOINC Meeting | Salt Lake City, UT USA

LOINC Update

Highlights since we last met

@djvreeman

Daniel J. Vreeman, PT, DPT, MS

Regenstrief-McDonald Scholar in Data Standards
Indiana University School of Medicine

Director, LOINC and Health Data Standards
Regenstrief Center for Biomedical Informatics

INDIANA UNIVERSITY
SCHOOL OF MEDICINE
Department of Medicine

Regenstrief Institute
Better Care. Better Health.

Salt Lake City / Intermountain Healthcare

Welcome!

42 in-person

252 online

30 countries represented

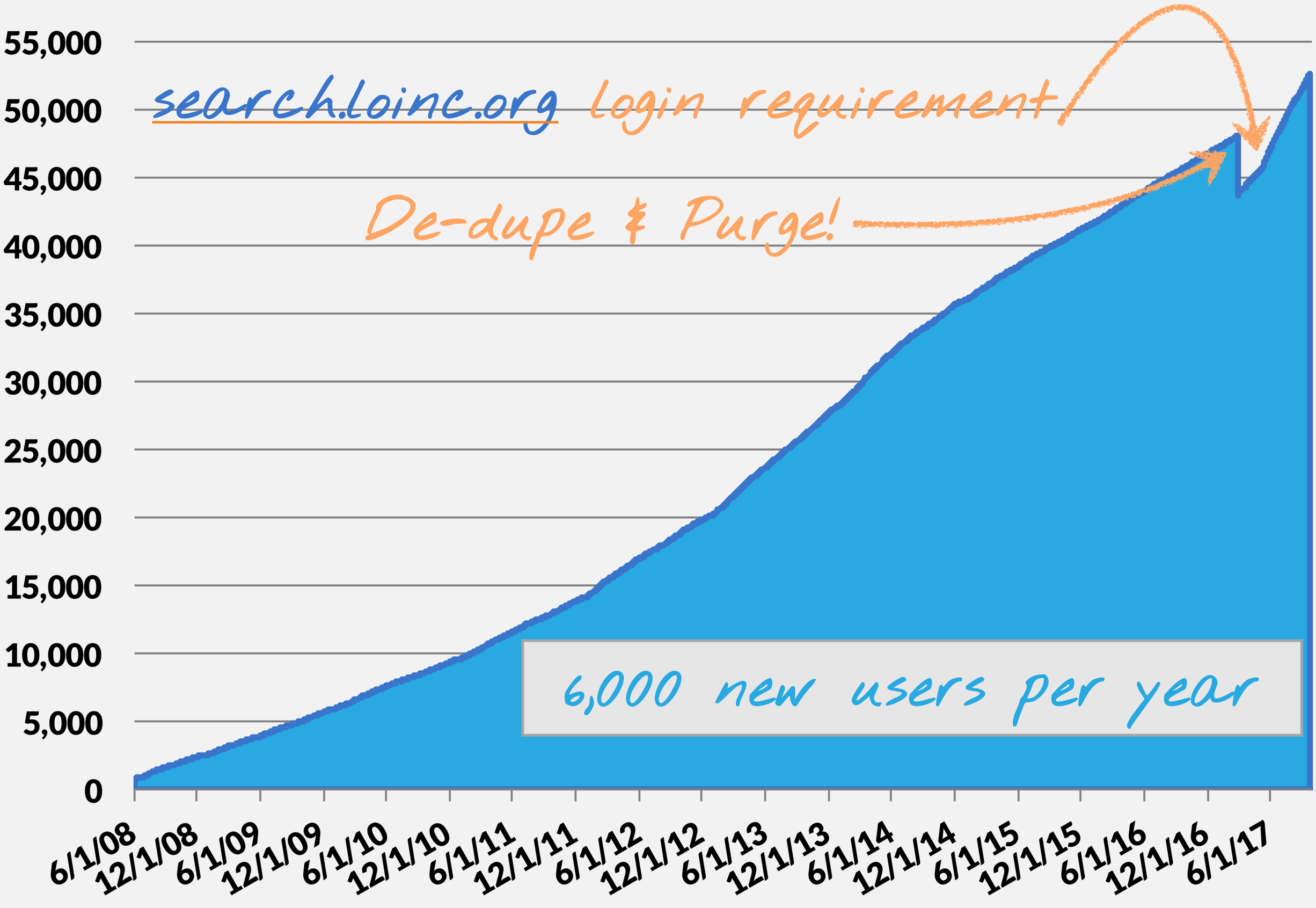
ARG, AUS, BGD, BRB, CAN, COL, DEU, EGY, ESP, FRA, GBR, IND, IRL, IRN, ITA, LBN, MEX, NGA, NLD, NZL, PAK, PRT, SAU, SGP, SVN, TUR, TWN, UGA, UKR, USA

Growth and Usage

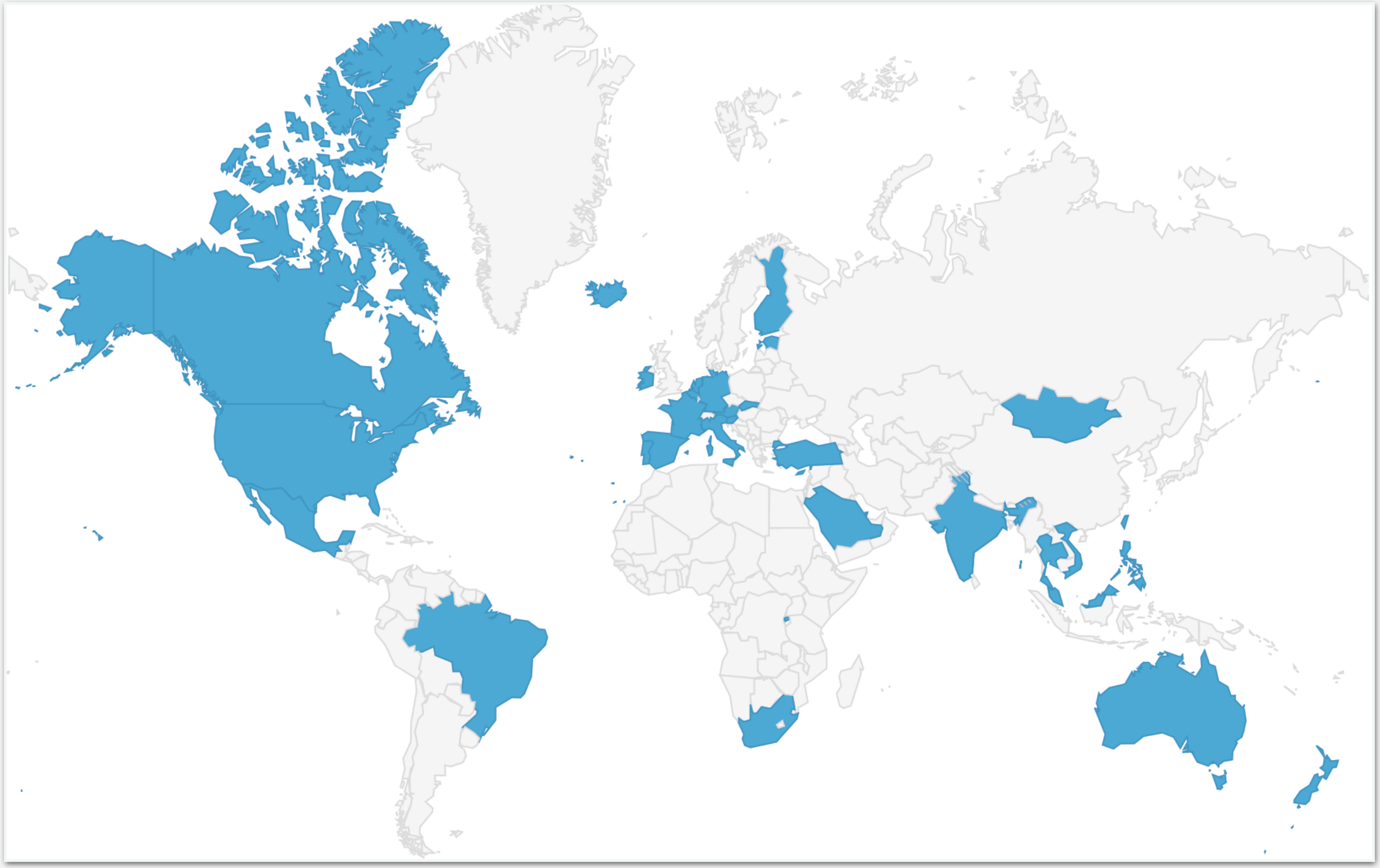
52,000+ registered users from 170 countries

6,000 new users per year

loinc.org registered users

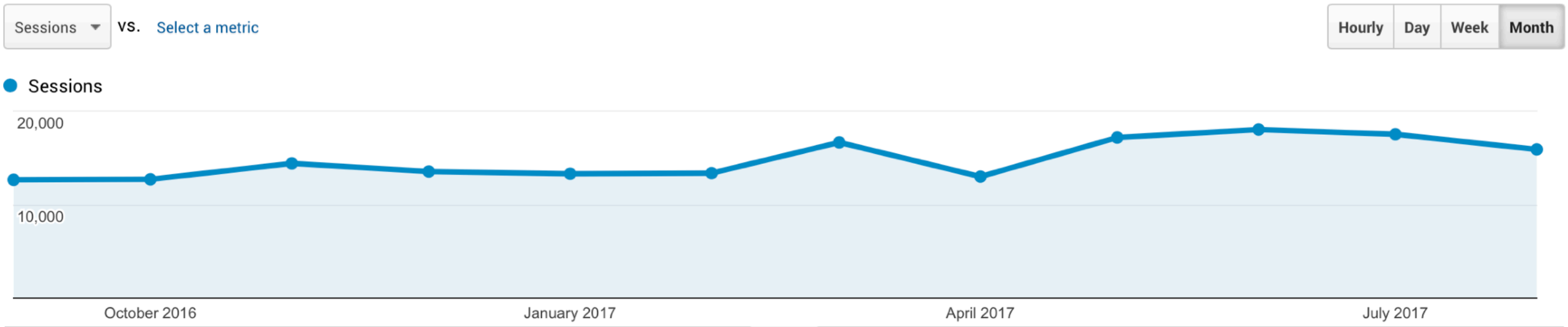


Official national standard in 30+ countries



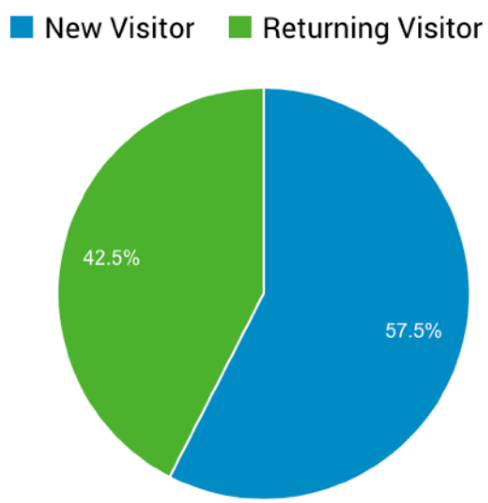
Overall loinc.org website traffic

Sep 2016 to Aug 2017



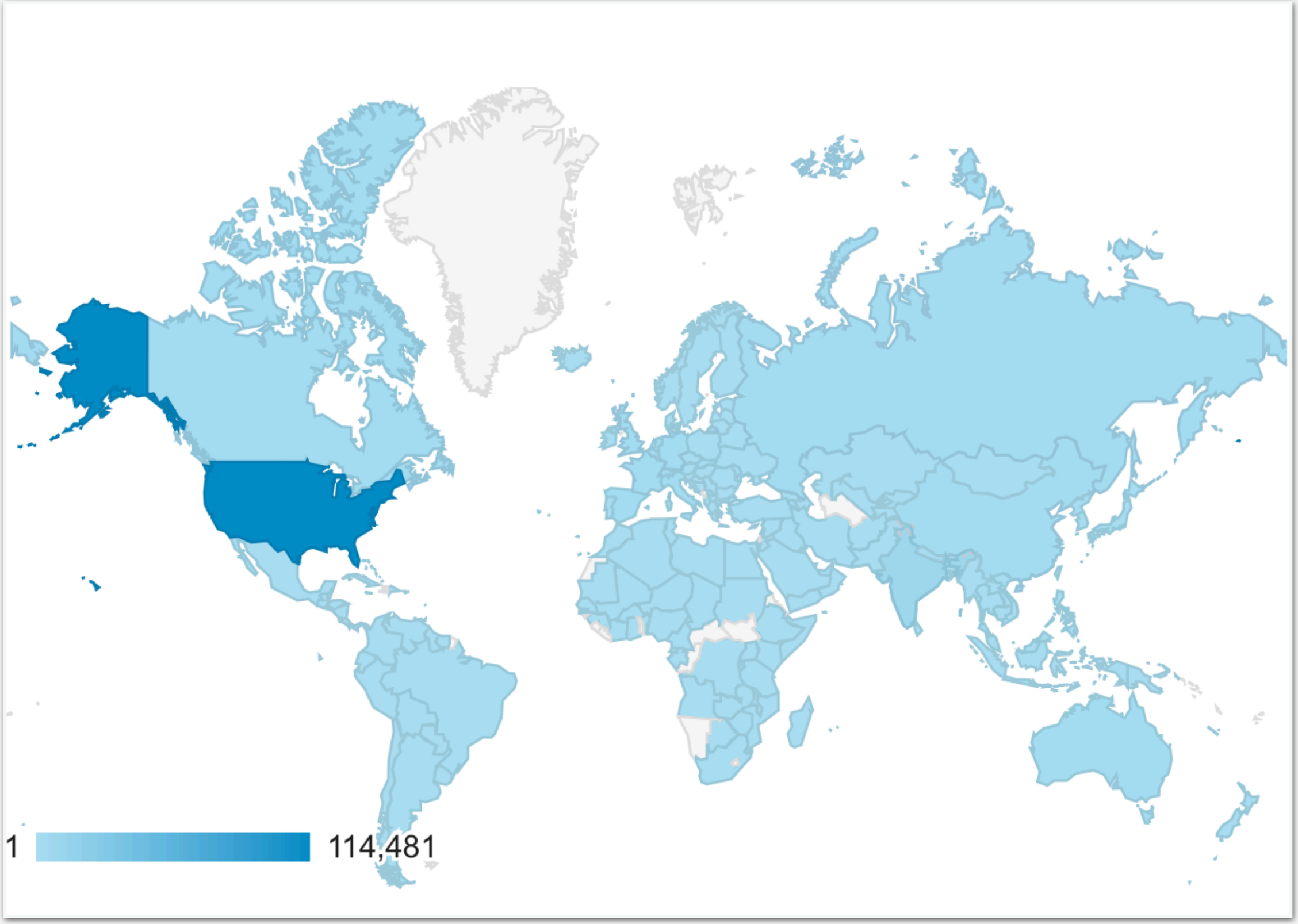
Sessions	Users	Pageviews
178,173	104,580	603,777

Pages / Session	Avg. Session Duration	Bounce Rate
3.39	00:03:20	49.66%



About 25% increase in sessions, users, and page views

Overall loinc.org website traffic



Overall loinc.org website traffic (2017)

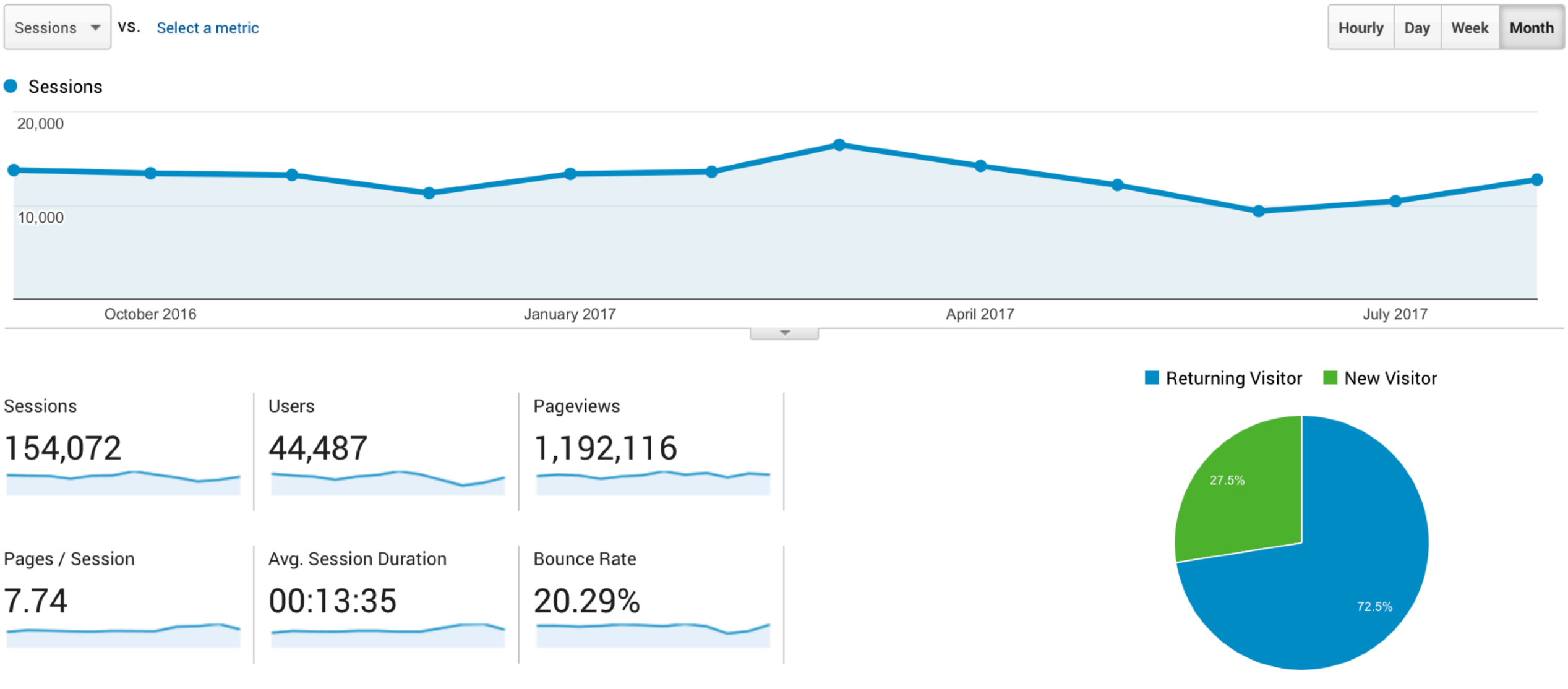
Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	124,885 % of Total: 100.00% (124,885)	55.78% Avg for View: 55.75% (0.05%)	69,655 % of Total: 100.05% (69,619)	48.54% Avg for View: 48.54% (0.00%)	3.45 Avg for View: 3.45 (0.00%)	00:03:26 Avg for View: 00:03:26 (0.00%)
1. United States	**81,557** (65.31%)	54.18%	44,188 (63.44%)	48.38%	3.42	00:03:27
2. India	**5,887** (4.71%)	60.59%	3,567 (5.12%)	50.55%	3.33	00:03:28
3. Canada	**3,430** (2.75%)	52.86%	1,813 (2.60%)	46.03%	3.47	00:03:00
4. Germany						:03:39
5. United Kingdom 🔥🔥🔥🔥🔥						:03:04
6. China						:07:09
7. France						:03:33
8. Russia 🔥🔥🔥🔥🔥						:01:37
9. Australia	**1,358** (1.09%)	57.51%	781 (1.12%)	49.48%	3.29	00:02:49
10. Netherlands	**1,340** (1.07%)	58.96%	790 (1.13%)	50.37%	3.32	00:02:45

#10 in 2015!

Up two slots each!

#17 in 2015!

search.loinc.org website traffic



Sep 2016 - Aug 2017 Summary

Translations into 18 variants of 12 languages

- Chinese (China)
  汉语/漢語;中文
- Dutch (Netherlands)
  Nederlands
- English (United States)
  Official Distribution
- Estonian (Estonia)
  eesti keel
- French (Belgium)
  français
- French (Canada)
  français
- French (France)
  français
- French (Switzerland)
  français
- German (Austria)
  Deutsch
- German (Germany)
  Deutsch
- German (Switzerland)
  Deutsch
- Greek (Greece)
  ελληνικά
- Italian (Italy)
  italiano
- Italian (Switzerland)
  italiano
- Korean (Korea, Republic of)
  한국어
- Portuguese (Brazil)
  português
- Russian (Russian Federation)
  ру́сский язы́к
- Spanish (Argentina)
  español
- Spanish (Mexico)
  español
- Spanish (Spain)
  español
- Turkish (Turkey)
  Türkçe

A small taste of recent LOINC adoption around the world

Growing Interest

India

MoH recommendations

Kazakhstan

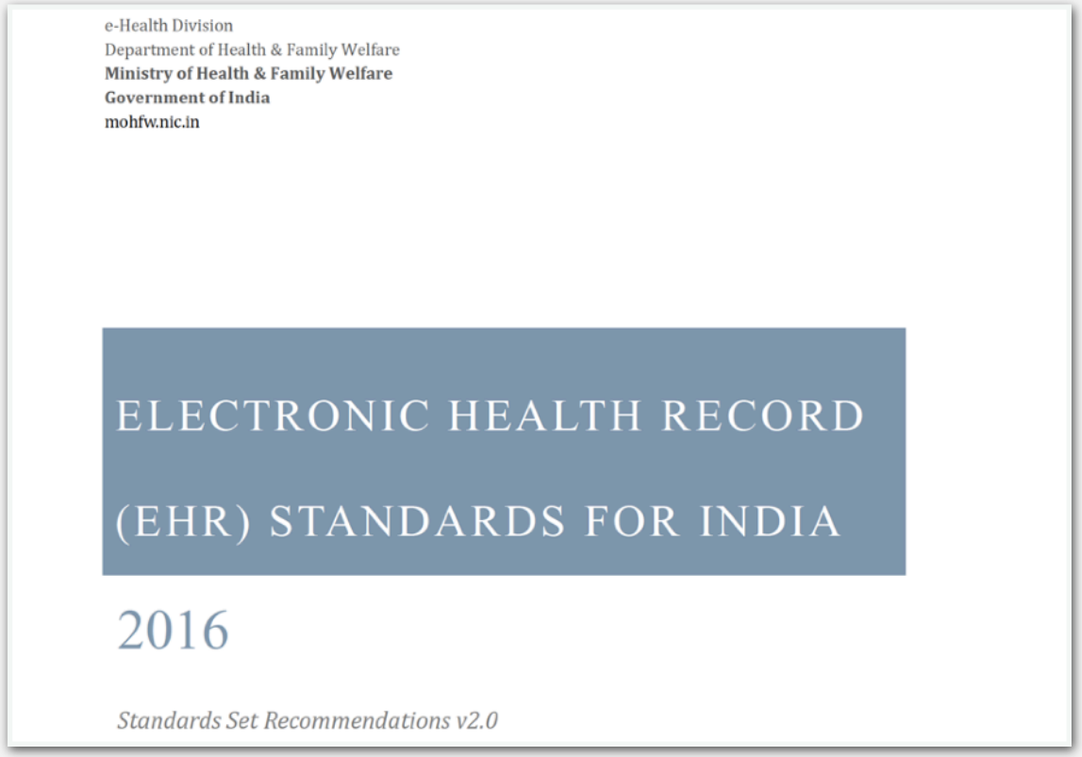
Likely MoH adoption

Portugal

National lab catalog

Ukraine

eHealth reform ->Translation


e-Health Division
Department of Health & Family Welfare
Ministry of Health & Family Welfare
Government of India
mohfw.nic.in

ELECTRONIC HEALTH RECORD

(EHR) STANDARDS FOR INDIA

2016

Standards Set Recommendations v2.0

2017

Interoperability Standards Advisory

Office of the National Coordinator for Health IT

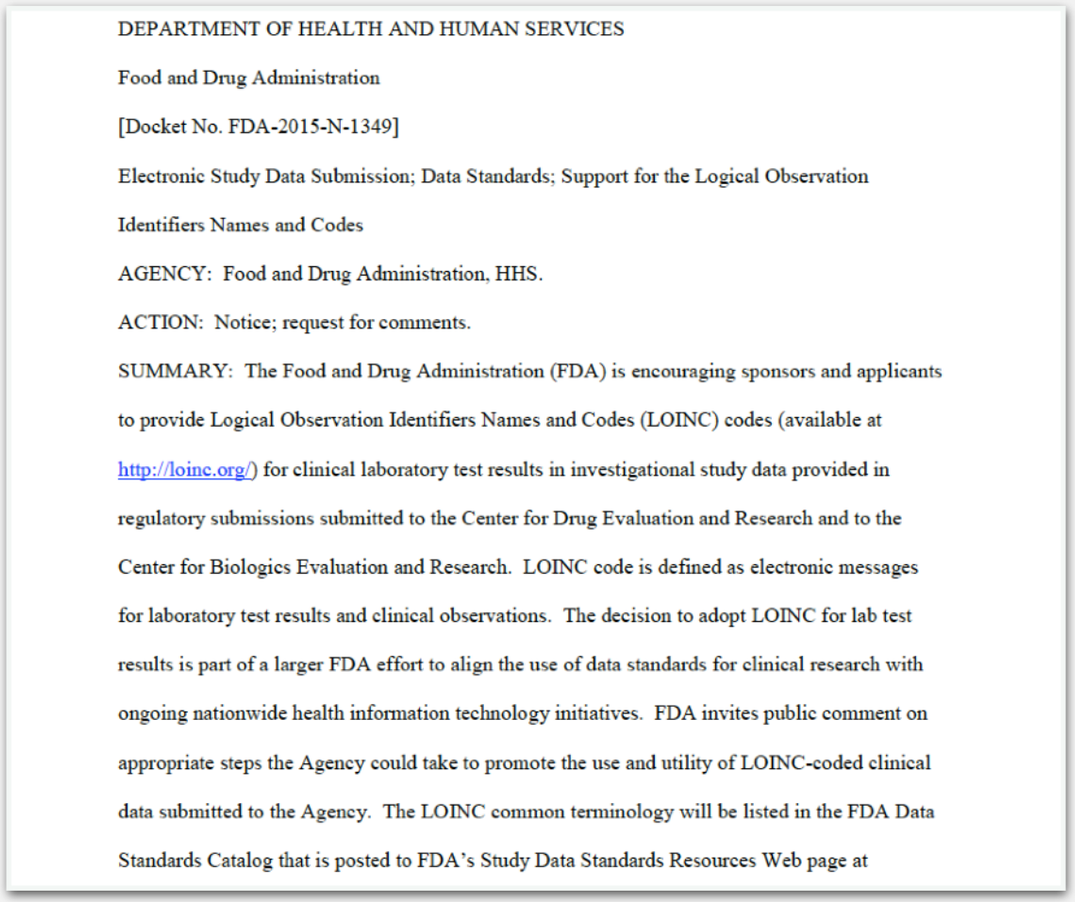
Lots o' LOINC

- Representing Patient Allergic Reactions
- Representing Patient Family Health History
- Representing Patient Functional Status and/or Disability
- Representing Imaging Diagnostics, Interventions and Procedures
- Representing Laboratory Tests
- Nursing
  - Representing Nursing Assessments
  - Representing Nursing Interventions
  - Representing Outcomes for Nursing
- Representing Patient Clinical "Problems" (i.e., Conditions)
- Sex at Birth, Sexual Orientation and Gender Identity
  - Representing Patient Gender Identity
  - Representing Patient Sex (At Birth)
  - Representing Patient-Identified Sexual Orientation
- Social Determinants
  - Representing Financial Resource Strain
  - Representing Level of Education
  - Representing Stress
  - Representing Depression
  - Representing Physical Activity
  - Representing Alcohol Use
  - Representing Social Connection and Isolation
  - Representing Exposure to Violence (Intimate Partner Violence)
- Representing Patient Tobacco Use (Smoking Status)
- Representing Patient Vital Signs

Comment period open now!

U.S. Food and Drug Administration

LOINC codes will be required for laboratory test data in studies starting after March 2018



DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

[Docket No. FDA-2015-N-1349]

Electronic Study Data Submission; Data Standards; Support for the Logical Observation Identifiers Names and Codes

AGENCY: Food and Drug Administration, HHS.

ACTION: Notice; request for comments.

SUMMARY: The Food and Drug Administration (FDA) is encouraging sponsors and applicants to provide Logical Observation Identifiers Names and Codes (LOINC) codes (available at http://loinc.org/) for clinical laboratory test results in investigational study data provided in regulatory submissions submitted to the Center for Drug Evaluation and Research and to the Center for Biologics Evaluation and Research. LOINC code is defined as electronic messages for laboratory test results and clinical observations. The decision to adopt LOINC for lab test results is part of a larger FDA effort to align the use of data standards for clinical research with ongoing nationwide health information technology initiatives. FDA invites public comment on appropriate steps the Agency could take to promote the use and utility of LOINC-coded clinical data submitted to the Agency. The LOINC common terminology will be listed in the FDA Data Standards Catalog that is posted to FDA's Study Data Standards Resources Web page at

Actively facilitating discussion with IVD vendors about identifying the LOINC codes associated with their products

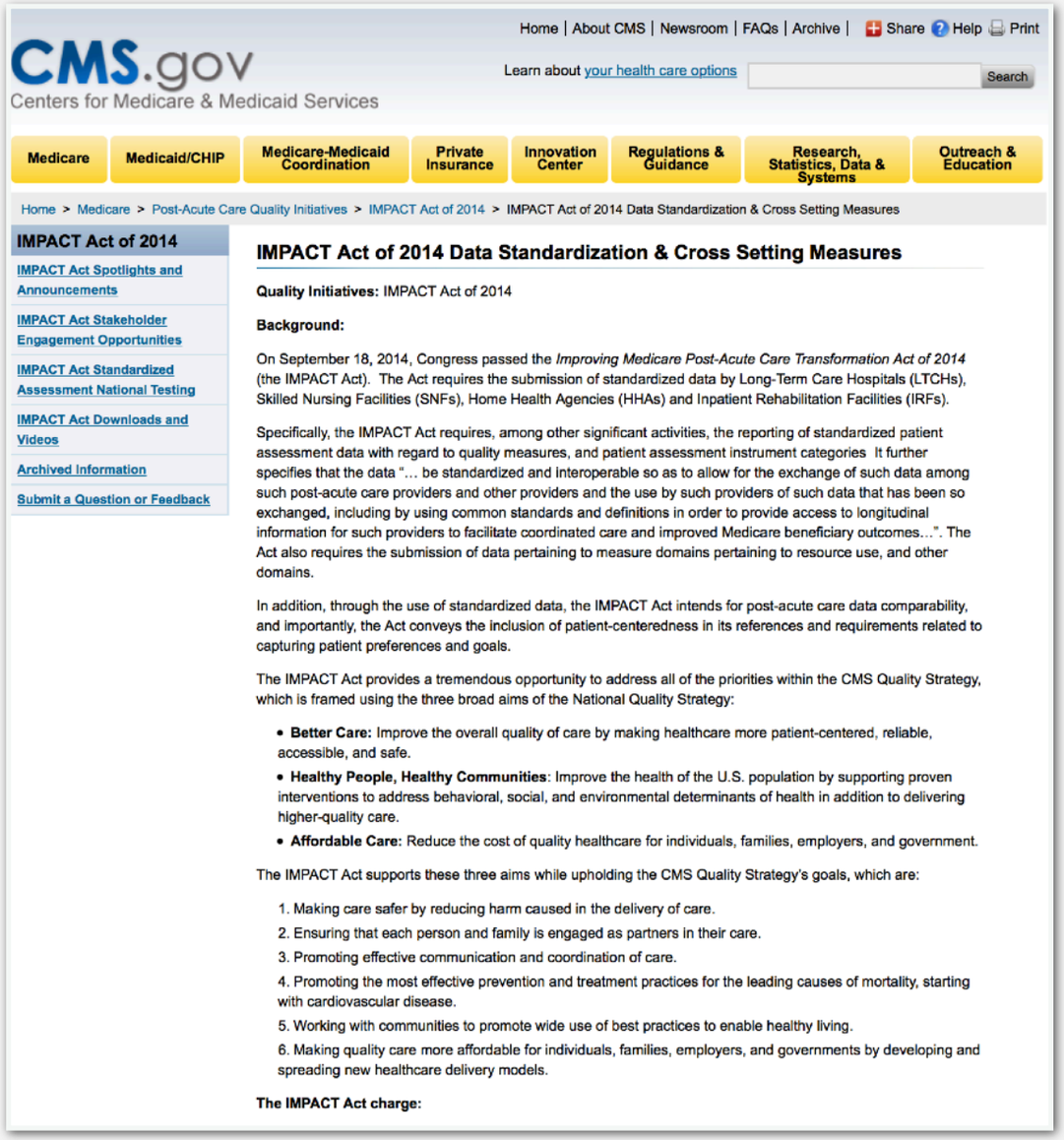
Funding development of a LOINC Micro implementation guide

Centers for Medicare & Medicaid Services

Long term goal of unification across settings. Representing all data elements from assessment instruments in LOINC.

Focused on MDS, OASIS, IRF-PAI, LCDS instruments now.

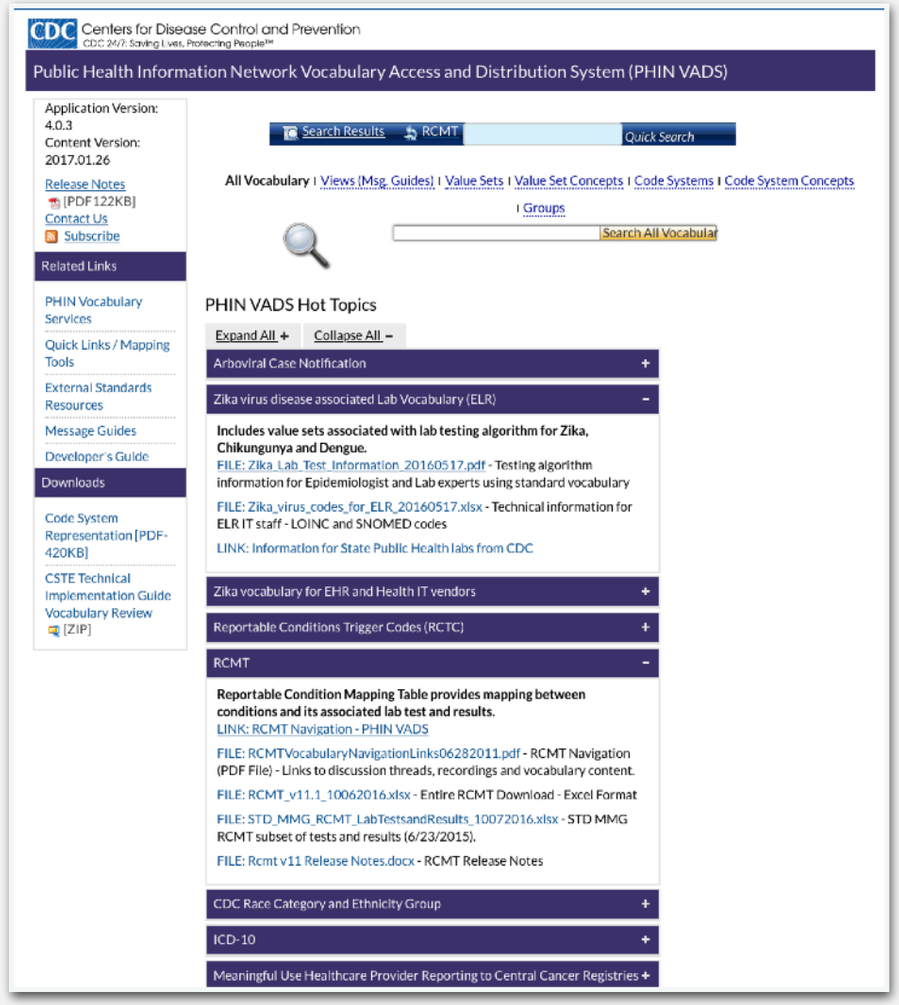
2,000+ individual data elements!



Centers for Disease Control and Prevention

Longtime users of LOINC:

- Electronic Laboratory Reporting
- Case Reporting
- Reportable Condition Mapping Table
- Immunization Messaging
- National Emergency Medical Services Info System
- National Trauma Data Standards
- National Healthcare Safety Network - Healthcare Associated Infection (HAI)



https://phinvads.cdc.gov/

Banding together for global good

Active Collaborations

IICC

HL7

IEEE

SNOMED Intl

RSNA

bioMérieux

NIDDK

APSE/CTSI

NCCIH

NIBIB

CMS

CAP/ICCR

```
{
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        "Publication Version ID": "1.0",
        "LOINC Version ID": "2.59",
        "LOINC Copyright": "This material contains content from LOINC® (http://loinc.org). The LOINC table, LOINC codes,
        "Localization": "en-US",
        "Region": "West North Central",
        "Equipment":
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                "IVD Test Result":
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                        "Vendor Analyte Name" : "Analyte Name A",
                        "Vendor Specimen Description" : "Isolate",
                        "Vendor Result Description" : "Nominal - Microorganism name",
                        "Vendor Reference ID" : "31112",
                        "Vendor Comment" : "JSON example for illustration purpose only",
                        "LOINC":
                        {
                            "LOINC CODE" : "11475-1",
                            "LOINC Long Name" : "Microorganism identified in Unspecified specimen by Culture",
                            "Component" : "Microorganism identified",
                            "Property" : "Prid",
                            "Time" : "Pt",
                            "System" : "XXX",
                            "Scale" : "Nom",
                            "Method" : "Culture"
                        }
```

Recent LOINC Papers

for the plane-ride home…

photo via striatic

Use of Radiology Procedure Codes in Health Care: The Need for Standardization and Structure[1]

Kenneth C. Wang, MD, PhD
Jigar B. Patel, MD
Bimal Vyas, MD
Michael Toland, BS
Beverly Collins, PhD
Daniel J. Vreeman, DPT, MS
Swapna Abhyankar, MD
Eliot L. Siegel, MD
Daniel L. Rubin, MD, MS
Curtis P. Langlotz, MD, PhD

Abbreviations: ACR = American College of Radiology, CPT = Current Procedural Terminology, DICOM = Digital Imaging and Communications in Medicine, ICD = International Classification of Diseases, LOINC = Logical Observation Identifiers Names and Codes, PACS = picture archiving and communication system, RID = RadLex identifier, RPID = RadLex Playbook identifier

RadioGraphics 2017; 37:1099–1110

https://doi.org/10.1148/rg.2017160188

Content Codes: HP IN

[1]From the Imaging Service, Baltimore VA Medical Center, 10 N Greene St, Room C1-24, Baltimore, MD 21201 (K.C.W., J.B.P., E.L.S.); Department of Diagnostic Radiology and Nuclear Medicine, University of Maryland School of Medicine, Baltimore, Md (K.C.W., J.B.P., B.V., M.T., E.L.S.); Department of Radiology, Hospital of the University of Pennsylvania, Philadelphia, Pa (B.C.); Indiana University School of Medicine, Indianapolis, Ind (D.J.V.); Regenstrief Institute, Indianapolis, Ind (D.J.V., S.A.); and Department of Radiology, Stanford University, Stanford, Calif (D.L.R., C.P.L.). Received August 27, 2016; revision requested December 13 and received Janu

Radiology procedure codes are a fundamental part of most radiology workflows, such as ordering, scheduling, billing, and image interpretation. Nonstandardized unstructured procedure codes have typically been used in radiology departments. Such codes may be sufficient for specific purposes, but they offer limited support for interoperability. As radiology workflows and the various forms of clinical data exchange have become more sophisticated, the need for more advanced interoperability with use of standardized structured codes has increased. For example, structured codes facilitate the automated identification of relevant prior imaging studies and the collection of data for radiation dose tracking. The authors review the role of imaging procedure codes in radiology departments and across the health care enterprise. Standards for radiology procedure coding are described, and the mechanisms of structured coding systems are reviewed. In particular, the structure of the RadLex™ Playbook coding system and examples of the use of this system are described. Harmonization of the RadLex Playbook system with the Logical Observation Identifiers Names and Codes standard, which is currently in progress, also is described. The benefits and challenges of adopting standardized codes—especially the difficulties in mapping local codes to standardized codes—are reviewed. Tools and strategies for mitigating these challenges, including the use of billing codes as an intermediate step in mapping, also are reviewed. In addition, the authors describe how to use the RadLex Playbook Web service application programming interface for partial automation of code mapping.

INTERNATIONAL JOURNAL OF NURSING KNOWLEDGE
The Official Journal of NANDA International, Inc.

Letter to the Editor

Letter to the Editor—Comments on the Use of LOINC and SNOMED CT for Representing Nursing Data

We are writing in response to Keenan et al.'s article (2017), "A Shovel-Ready Solution to Fill the Nursing Data Gap in the Interdisciplinary Clinical Picture," in which the authors recommend that the American Academy of Nursing (AAN) should update its 2014 recommendations (Clancy et al., 2014) for using the SNOMED CT and Logical Observation Identifiers Names and Codes (LOINC©) terminologies in favor of a tool such as the Hands-on Automated Nursing Data System (HANDS). HANDS is a commercial software module for collecting nursing data that requires custom interfaces to connect with electronic health record systems (EHRs). To start, it is important to distinguish between terminologies and software. Standard terminologies, including the NANDA International (NANDA-I) diagnoses, the Nursing Intervention Classification (NIC) interventions, the Nursing Outcome Classification (NOC) outcomes, SNOMED CT and LOINC, are intended to be technology-neutral. Although HANDS uses standard terminologies (NIC, NOC and NANDA-I), it is proprietary software, and it would be highly inappropriate for

LOINC and SNOMED CT are complementary terminology standards that are both required by the Meaningful Use regulations in the United States as well as eHealth initiatives in other countries. In July 2013, the Regenstrief Institute, Inc., which maintains the LOINC terminology, and SNOMED International (formerly known as IHTSDO) signed a landmark long-term collaboration agreement to align how LOINC and SNOMED CT represent laboratory tests and some types of clinical measurements (Regenstrief Institute and SNOMED International, 2013). In general, LOINC is used to represent the observation being collected (the "question") and SNOMED CT is used for the observation value (the "answer"). For example, LOINC code 80345-2 "Pressure points examined" would be used to record the SNOMED CT values for the anatomical locations, such as occiput, elbow or heel, that were evaluated during a nursing skin assessment. Quantitative observations, such as diastolic blood pressure or the width of a wound, are typically recorded using LOINC codes with numeric results as the observation values. Other parts

CONCLUSIONS: Authors present recommendations for revisions to AAN's plan and an evidence-based alternative to generating interoperable nursing data in the near term. These revisions can ultimately lead to the proposed terminology goals

Conflict of Interest: The HANDS

Journal of the American Medical Informatics Association, 0(0), 2017, 1–2
doi: 10.1093/jamia/ocx087
Letter to the Editor

Letter to the Editor

Re: Unit conversions between LOINC codes Published June 19, 2017

Daniel J Vreeman,[1] Swapna Abhyankar,[2] and Clement J McDonald[3]

[1]Director, LOINC and Health Data Standards, Regenstrief Institute; Regenstrief-McDonald Scholar in Data Standards, Indiana University School of Medicine, Indianapolis, IN, USA, [2]Associate Director for Content Development, LOINC and Health Data Standards, Regenstrief Institute, Indianapolis, IN, USA and [3]Director, Lister Hill National Center for Biomedical Communications, National Library of Medicine, National Institutes of Health, Bethesda, MD, USA

ABSTRACT

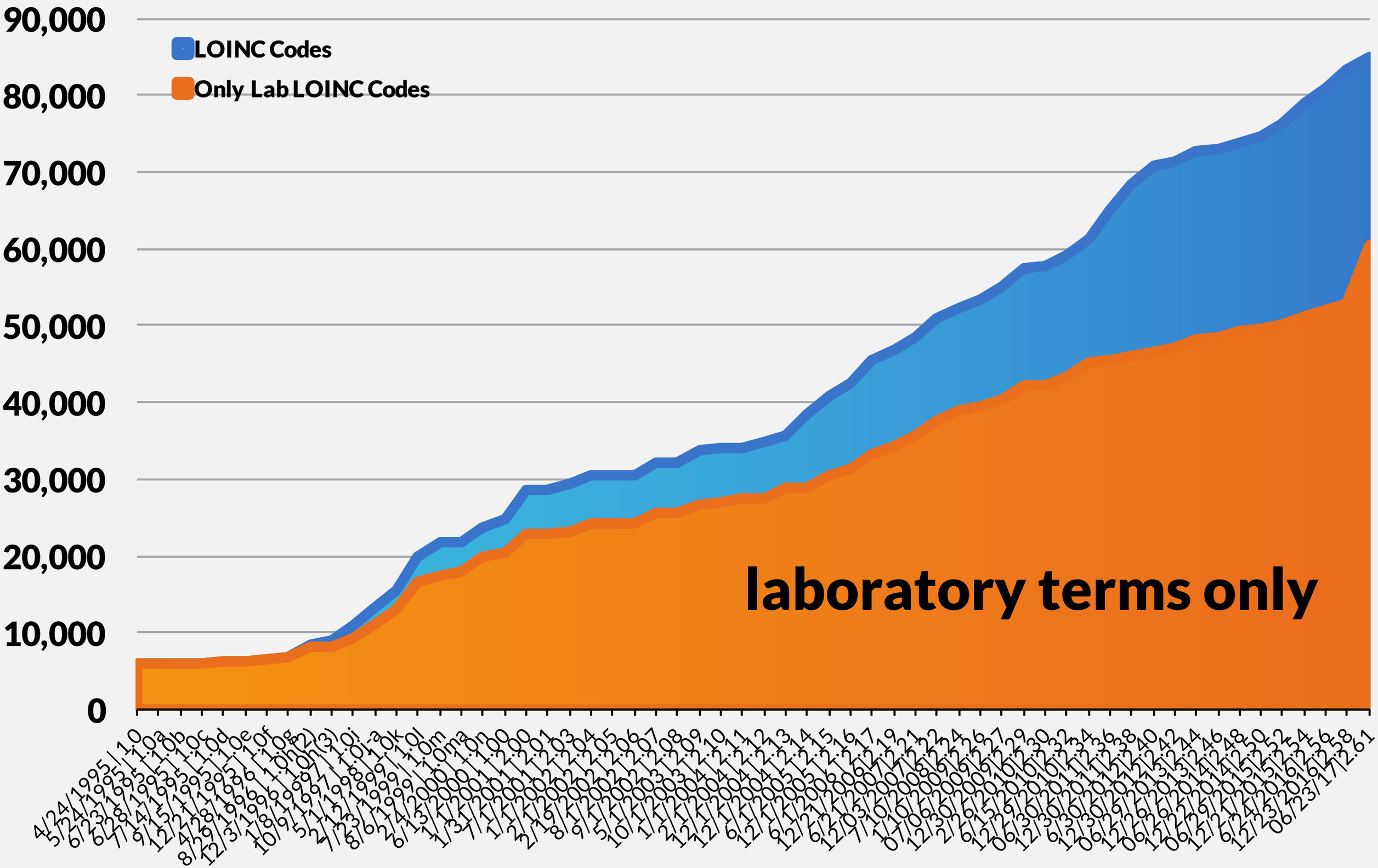
Logical Observation Identifiers Names and Codes (LOINC) is the most widely used controlled vocabulary to identify laboratory tests. A given laboratory test can often be reported in more than 1 unit of measure (eg, grams or moles), and LOINC defines unique codes for each unit. Consequently, an identical laboratory test performed by 2 different clinical laboratories may have different LOINC codes. The absence of unit conversions be-

We applaud the work of Hauser et al.,[1] who have realized the potential for converting result values associated with one Logical Observation Identifiers Names and Codes (LOINC) term to those associated with another through mathematical operations. They applied these transforms to pairs of terms in several categories, including those expressed as molar versus mass units, simple counts on different scales, linear versus log values, and 2 terms that are inverse. "mmol/L" or "mg/24 h" would not be allowed for mass concentration terms, because the first has a molar unit in the numerator rather than a mass unit and the second has a time unit in the denominator rather than a volume unit; instead, these units represent **molar concentration** (moles/volume) and **mass rate** (mass/time), respectively. As Hauser et al. illustrated, discrepancies between the *Property* of a LOINC term and the reported units of measure for a test signal a po-

LOINC Release

2.61

LOINC Codes Over Time by Release



Median turnaround time

About 75 days for lab requests

About 72 days for clinical requests

Current request queue

3600+ requested LOINCs

87% of those requested within the last 3 months*

**Terms older than 3 months may be awaiting submitter information, Committee review, etc.*

Continue evolving our multi-level QA process to try to decrease that time even further

Reminder of coming data file changes

Approved expansion of most text field sizes to 255 characters

See Release Notes or Announcement

New changes (for June 2018)

Pascal case (and potentially other) changes to file name conventions

Making the *Answers* worksheet of *Panels and Forms File* consistent with the structure of the new *AnswerList* file.

License Updates

Added new release files

Same basic principles

Updated Third Party attributions

Spoiler alert! Now contains some SNOMED CT and RxNorm mappings

RELMA 6.19 Updates

Updated Translations

Chinese (China)

汉语/漢語;中文

French (Canada)

français

Spanish (Spain)

español

No new features…

But a good visualization of our new multi-axial hierarchy enhancements.

I won’t steal Swapna’s thunder though…

Canonical LOINC Representation in FHIR

FHIR Terminology Services

http://loinc.org/fhir/loinc.xml

We are collaboratively defining a canonical representation of LOINC for use in FHIR as a CodeSystem

Specifies generic filters/attributes:

parent, child, ancestor, descendant

Specifies LOINC-specific filters/attributes:

STATUS, COMPONENT, PROPERTY, etc

Special attributes for Document Ontology and Radiology

People want to use Part codes here (e.g. compose/decompose)

```
</property>
<!--
  LOINC properties.
  These apply to the main LOINC codes, but not the Multiaxial Hierarchy, the answer lists, or the part codes.

  Notes:
    SHORTNAME = display & LONG_COMMON_NAME = definition
    Properties are specified as type "code", which are LOINC Part codes (LP-).
    It is anticipated that the LOINC Part codes to be used in these properties will be published in the June 2017 LOINC release.
-->
<property>
  <code value="STATUS"/>
  <uri value="http://loinc.org/property/STATUS"/>
  <description value="Status of the term. Within LOINC, codes with STATUS=DEPRECATED are considered inactive. Current values: ACTI
  <!-- DV NOTE: changed this from boolean to string -->
  <type value="string"/>
</property>
<property>
  <code value="COMPONENT"/>
  <uri value="http://loinc.org/property/COMPONENT"/>
  <description value="First major axis-component or analyte: Analyte Name, Analyte sub-class, Challenge"/>
  <type value="coding"/>
</property>
<property>
  <code value="PROPERTY"/>
  <uri value="http://loinc.org/property/PROPERTY"/>
  <description value="Second major axis-property observed: Kind of Property (also called kind of quantity)"/>
  <type value="coding"/>
</property>
<property>
  <code value="TIME_ASPCT"/>
  <uri value="http://loinc.org/property/TIME_ASPCT"/>
  <description value="Third major axis-timing of the measurement: Time Aspect (Point or moment in time vs. time interval)"/>
```

LOINC Award for Distinguished Contributions

Purpose

The ***LOINC Award for Distinguished Contributions*** honors an individual who has made sustained and enduring contributions that advance health data interoperability with LOINC.

Award Criteria

This award recognizes exceptional and enduring actions, activities, and accomplishments that advance the promotion of LOINC and its use to improve health. A member of the LOINC community is eligible to receive this award based on their thought leadership, success in the implementation, promotion of awareness and adoption, education, and/or fostering cooperation and collaboration.

Award Presentation

The ***LOINC Award for Distinguished Contributions*** will be presented at the June Laboratory LOINC Committee meeting.

Cindy Johns, MSA

2016 Honoree

Gilbert Hill, MD, PhD

2016 Honoree

loinc.org/susan

LOINC honors Susan Matney for contributions to advancement of health data interoperability

By Katie Allen
June 21, 2017 (2017-06-21)
Press Release

INDIANAPOLIS — LOINC, the world's most commonly used universal code system for identifying medical test results, observations and other clinical measurements, has announced the recipient of the annual LOINC Award for Distinguished Contributions. The award, in its second year, honors individuals whose work advances the interoperability that ensures that medical data can be recorded, electronically exchanged and ultimately used to improve health -- when and where needed.

Susan Matney

Susan Matney, PhD of Salt Lake City, Utah was presented with the award at the annual LOINC meeting in June. Matney is long-time active member of the LOINC community.

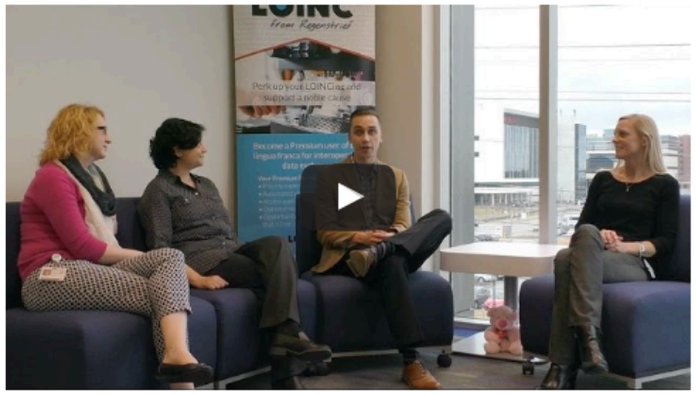
Matney, a veteran nurse, is now a Senior Medical Informaticist with Intermountain Healthcare. She is a Fellow of the American Academy of Nursing and was selected as the 2007 pioneer in nursing informatics by the AMIA nursing working group. Recognizing the need to harmonize the use of LOINC with another leading multidisciplinary terminology, Dr. Matney led efforts to create collaboration between the two to meet the needs of the nursing community. As part of the Nursing Knowledge Big Data Science Intitative, Dr. Matney co-leads a workgroup focused on clinical models and terminology standards. Matney was instrumental in

Coming Attractions

LOINCinars

Introducing our new webinar series for LOINC Premium Members

LOINC Premium Members have exclusive access to our new LOINCinar series. A LOINCinar is an interactive webinar covering all things LOINC. They are a great opportunity to learn more about LOINC, ask questions, and hear directly from our team of experts. LOINCinars are offered every 4-6 weeks as 60-minute live events covering a variety of topics. Each session offers in-depth explanations and allows plenty of time for your questions. Our goal is for you to succeed with LOINC.



Send us your suggestions for future LOINCinar topics

NEXT LOINCINAR

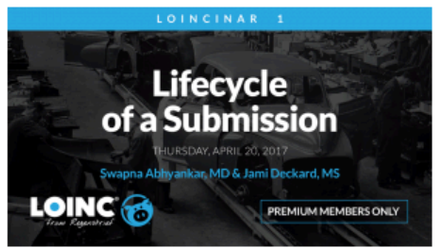
We will be announcing our next LOINCinar very soon!

LOINC Premium Members, watch your email for details and how to RSVP.

NOW AVAILABLE

Sneak Peek! New LOINC Artifacts

LOINCINAR 2 RECORDED 2017-05-23 42 MINUTES



Lifecycle of a Submission

This first LOINCinar explains how we process submissions, from our first look at the information you send through the creation and publication of new codes. It's your backstage pass that will give you a better understanding of our content development and QA workflows.

LOINCINAR 1 RECORDED 2017-04-20 55 MINUTES

Upcoming Meetings

Tutorial at MedInfo Congress 2017

(Hangzhou, China)

2017-09-26 to 2017-09-28

Tutorial at AMIA Annual Symposium

(Washington, D.C. USA)

2017-11-04 to 2017 11 08

**Also sessions including RSNA, IEEE collaborations

FHIR DevDays - Terminology Track

(Amsterdam, Netherlands)

2017-11-15 to 2017-11-16

Winter 2017 Lab LOINC Meeting

(Indianapolis, IN USA)

2017-12-06 to 2017-12-07

Spring 2018 International LOINC Meeting

(Tentative)

TBD

Summer 2018 Lab LOINC Meeting

(Indianapolis, IN USA)

2018-06-06 to 2017-06-07

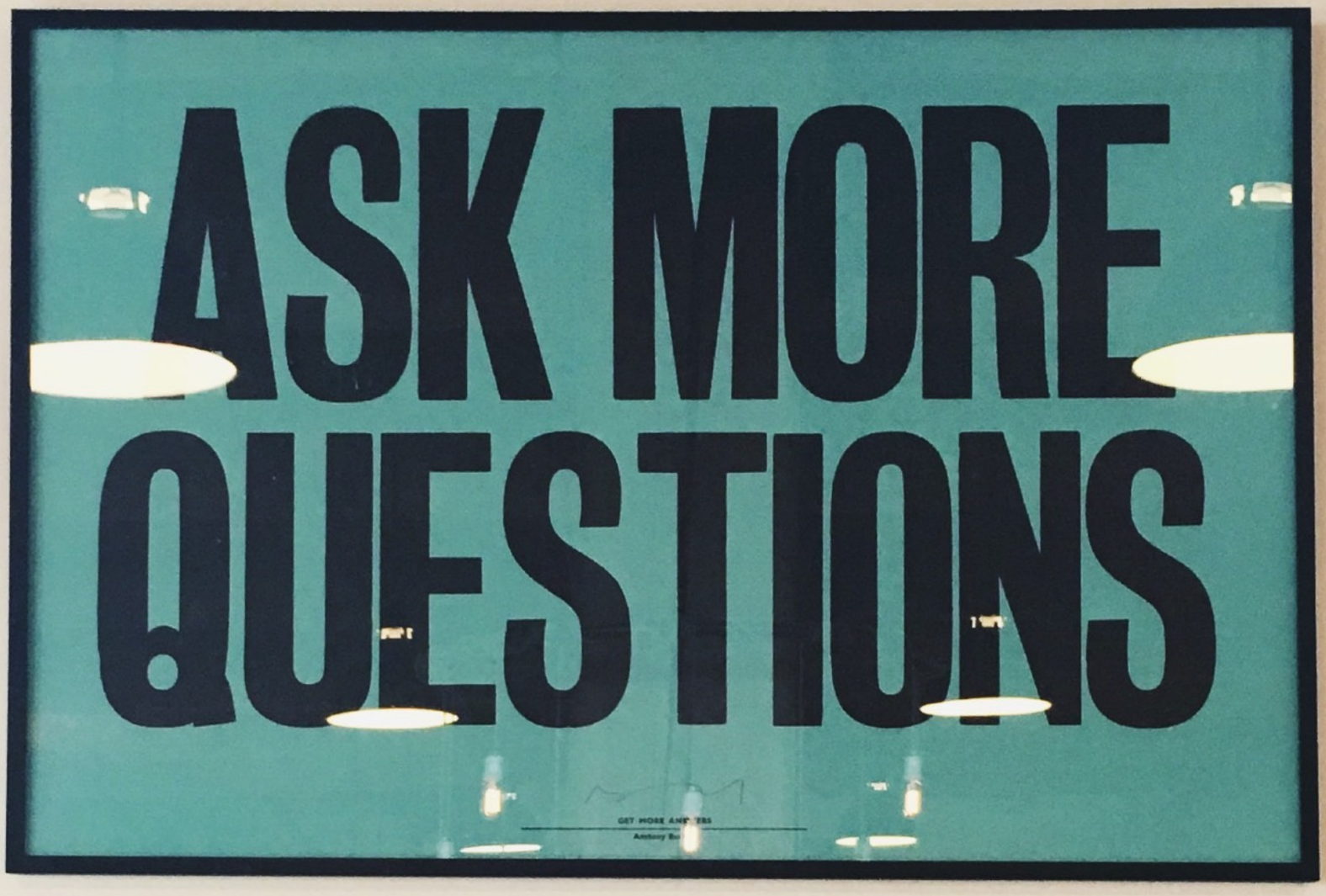
Enhanced Educational Opportunities

More modular approach

Possible sessions include:

- Submitting new term requests
- Domain-specific mapping tips (micro, genetics)
- Deep dive into accessory files
- Mapping lab

What would you like to see?


ASK MORE
QUESTIONS