Clinical LOINC Meeting - Salt Lake City, UT USA

LOINC® from Regenstrief

Updates on LOINC

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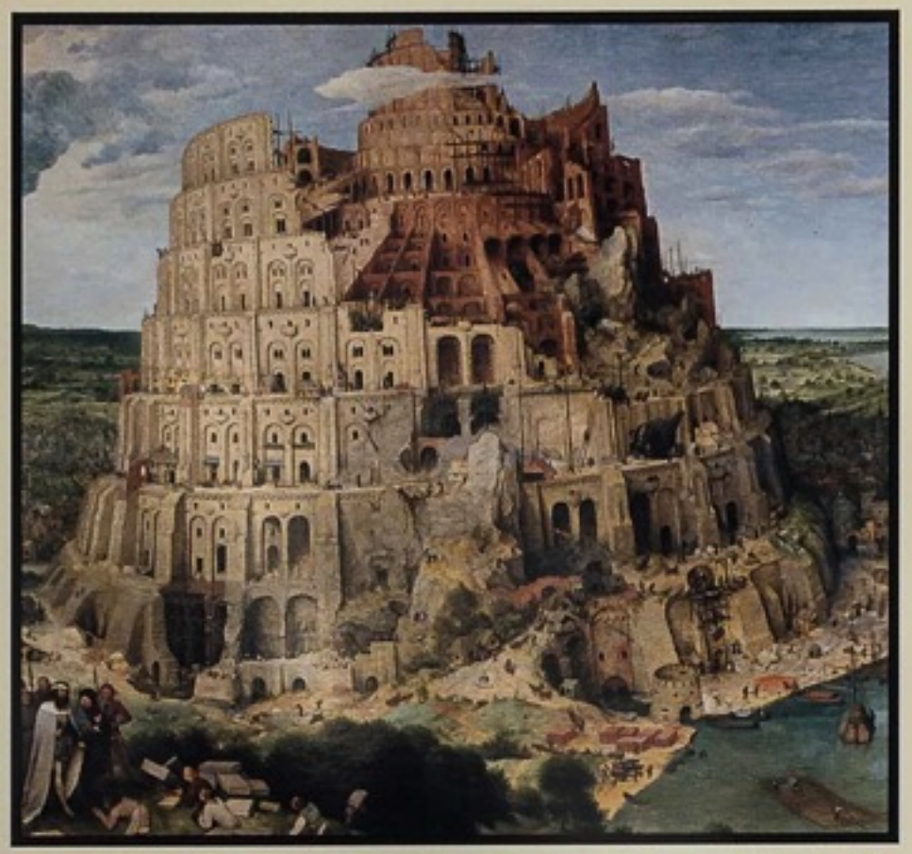
@djvreeman

INDIANA UNIVERSITY
DEPARTMENT OF MEDICINE
School of Medicine

Regenstrief Institute
Center for Biomedical Informatics
Better Care. Better Health.

ESCAPE FROM MEDICAL DATA BABEL!



Pieter Bruegel, *The Tower of Babel*, 1563. With permission from Kunsthistorisches Museum, Vienna.

Demand Informatics Standards.

Message Standards

Clinical Data: ASTM/HL7
Insurance & Remittance: ASC X12
Diagnostic Images: DICOM
Community Pharmacy Messages: NCPDP
Data Models/Frameworks: IEEE, HL7, CORBAMED, ASTM
Knowledge Representation: ASTM's Arden Syntax, HL7
Security: IP SSL, HL7, ASTM
Communications: IP Protocols

Code Standards

Links Between Vocabularies: NLM's UMLS
Laboratory & Clinical Observations: LOINC
DX & Procedure Codes: ICD9, ICD10, CPT4
Units Codes: HL7's ISO+
Drug Codes: NDC, WHO
Device Classification Codes: UMDNS
DX, Problems, Organism Names, etc: SNOMED, MEDDRA, READ
Provider Codes: HCFA's NPI

Help Shape Their Development.

For draft standards, data bases of codes, and links to standards development organizations:
On the Web: http://www.mcis.duke.edu/standards/guide.htm

For more information:
email: standards@regenstrief.iupui.edu
Mail: Standards, Regenstrief Institute,
1001 W. 10th St. Indianapolis, IN 46202

Supported in part by a grant from The John A. Hartford Foundation, Inc.

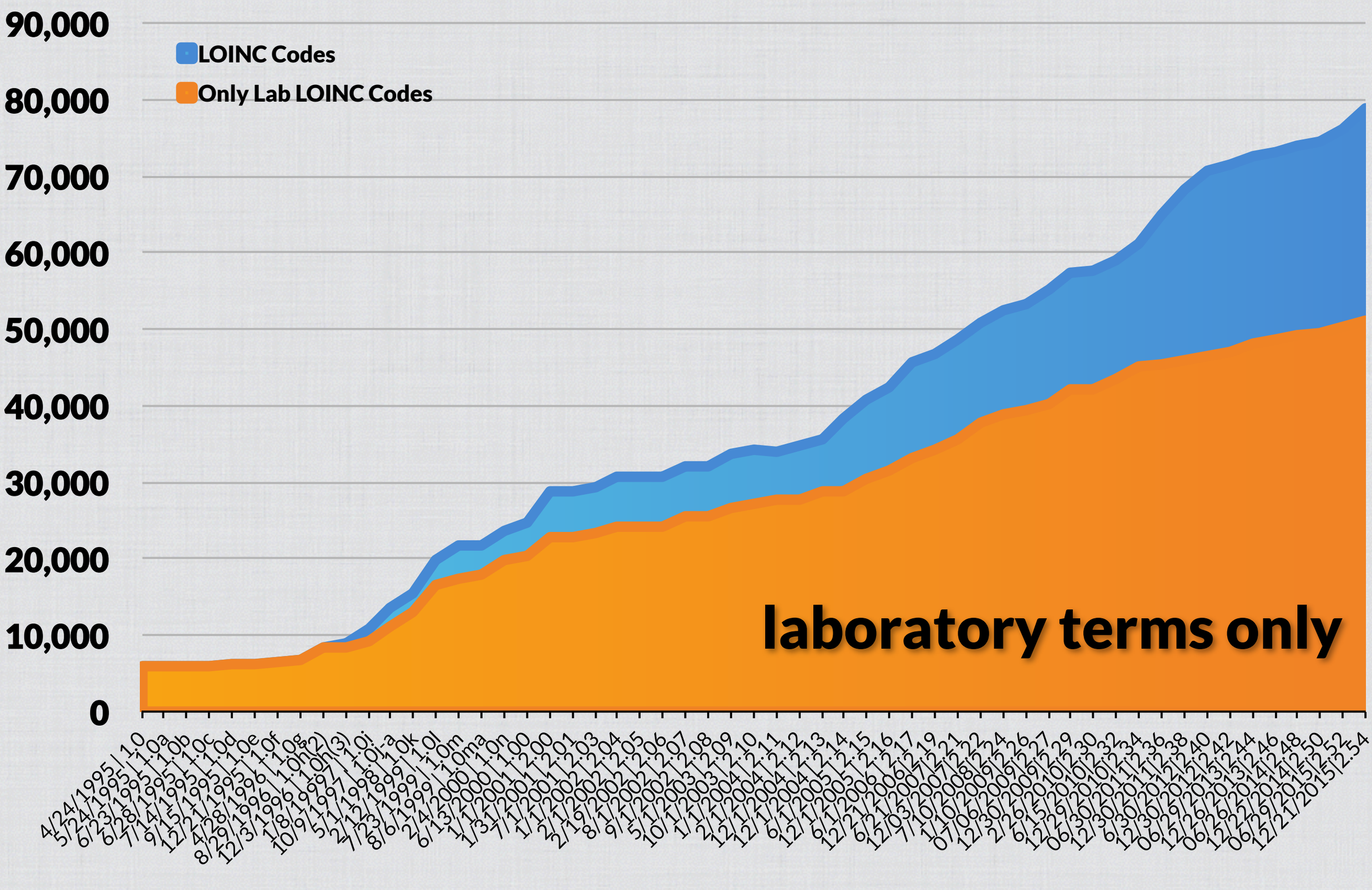
Overview

1. Growth and adoption
2. LOINC and RELMA release highlights
3. Brief update on collaborations
4. No shortage of work…

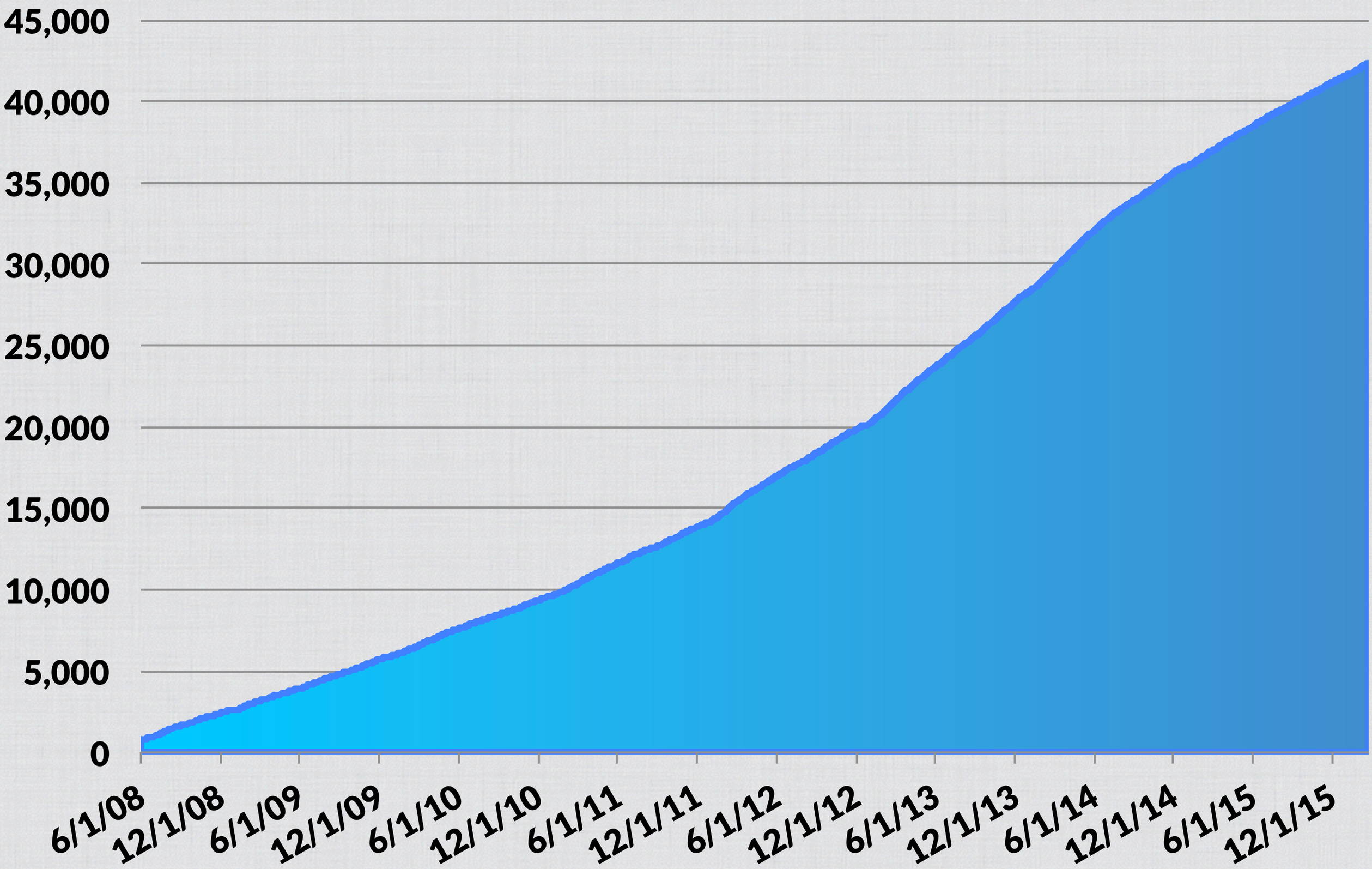
photo via Vernio77

42,000+ registered users in 171 countries

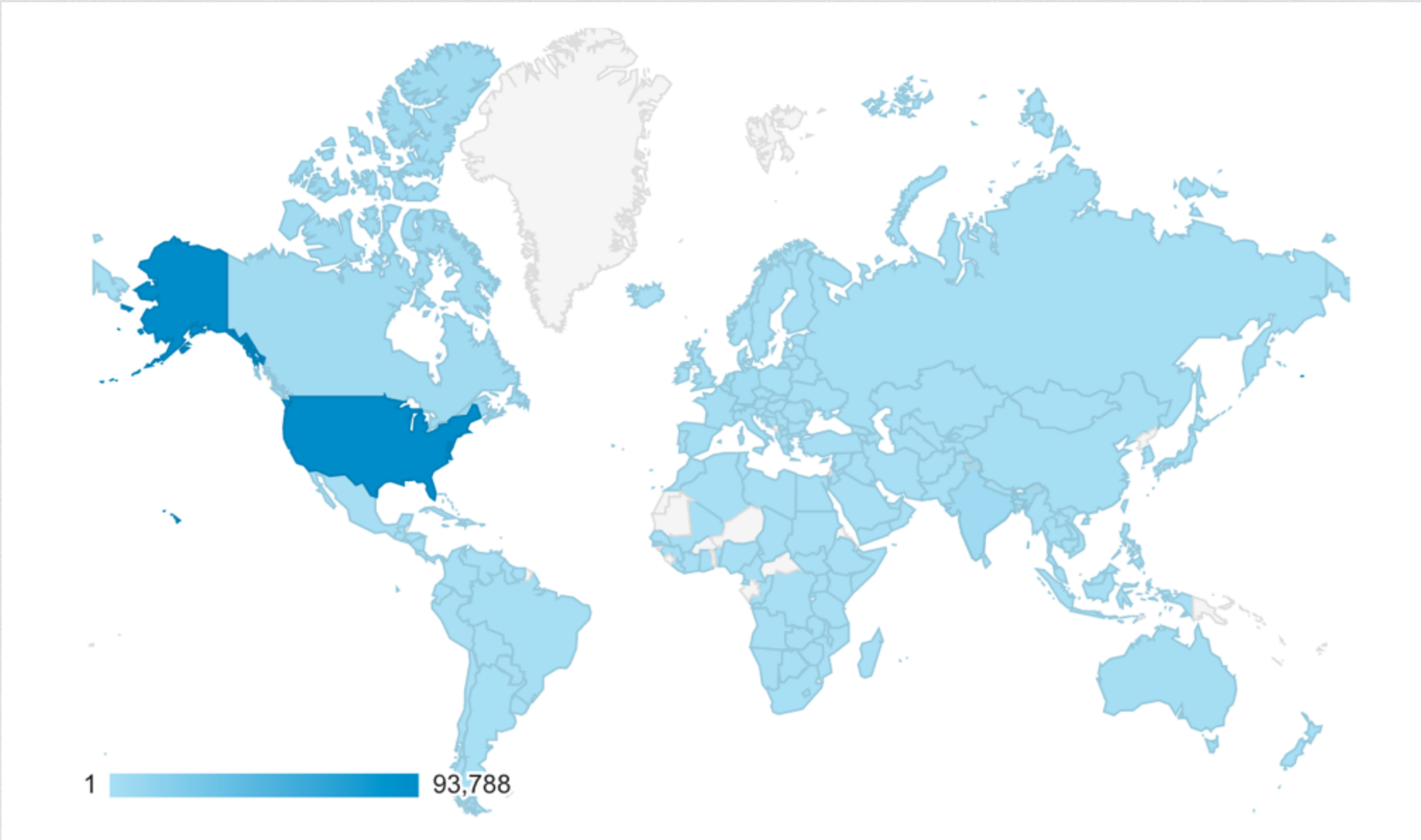
LOINC Codes Over Time by Release



loinc.org registered users



loinc.org sessions (2015 02 to 2016 02)

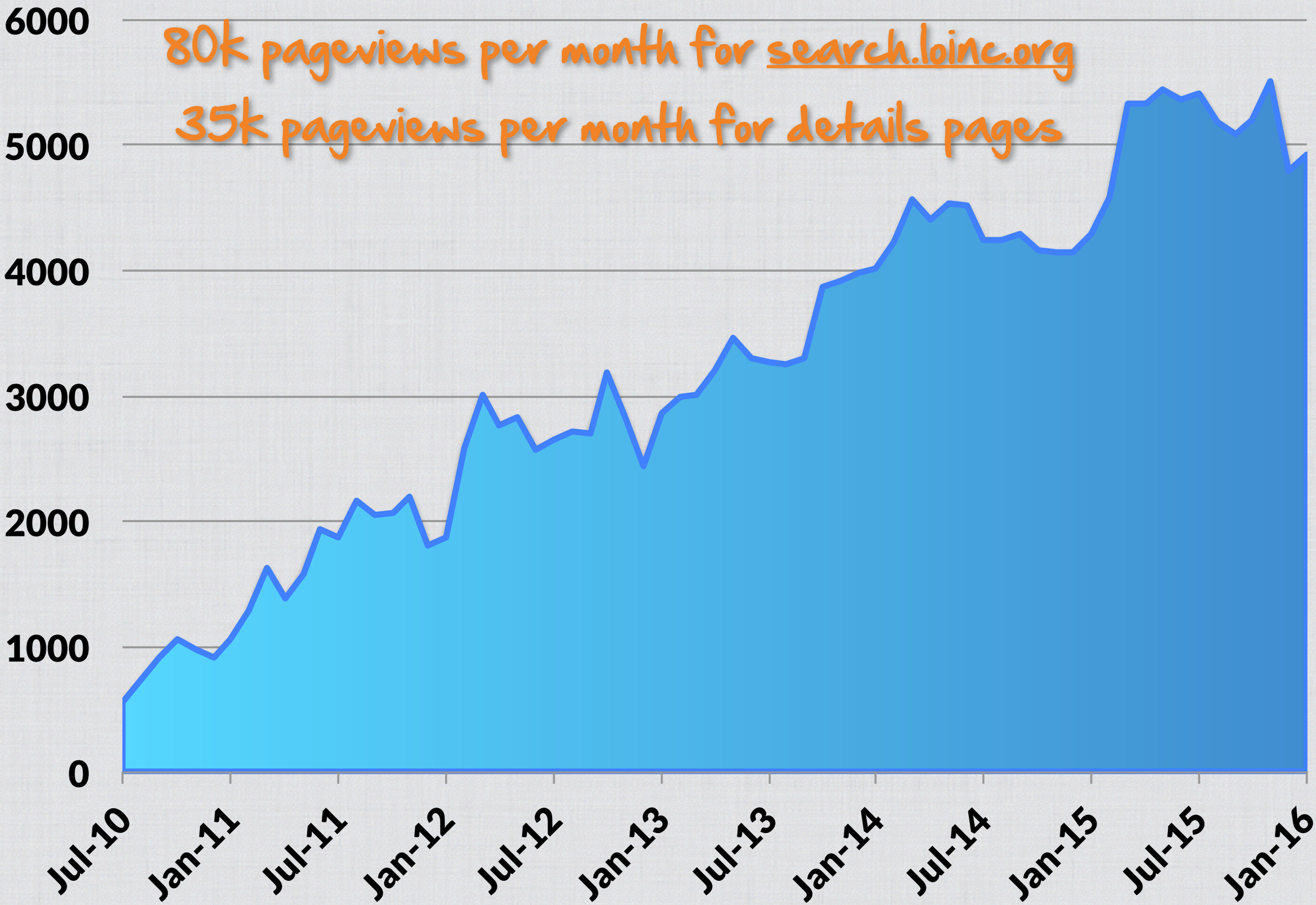


loinc.org sessions (2015 02 to 2016 02)

Country	Acquisition			Behavior			Conversions		
	Sessions ↓	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
	138,575 % of Total: 100.00% (138,575)	59.22% Avg for View: 59.17% (0.08%)	82,063 % of Total: 100.08% (81,995)	55.45% Avg for View: 55.45% (0.00%)	3.33 Avg for View: 3.33 (0.00%)	00:03:04 Avg for View: 00:03:04 (0.00%)	0.00% Avg for View: 0.00% (0.00%)	0 % of Total: 0.00% (0)	$0.00 % of Total: 0.00% ($0.00)
1. United States	**93,788** (67.68%)	57.20%	53,651 (65.38%)	55.98%	3.20	00:02:51	0.00%	0 (0.00%)	$0.00 (0.00%)
2. India	**5,548** (4.00%)	71.56%	3,970 (4.84%)	54.56%	3.29	00:03:07	0.00%	0 (0.00%)	$0.00 (0.00%)
3. Canada	**4,052** (2.92%)	56.39%	2,285 (2.78%)	50.81%	3.54	00:03:38	0.00%	0 (0.00%)	$0.00 (0.00%)
4. Germany	**2,642** (1.91%)	71.54%	1,890 (2.30%)	51.36%	6.28	00:08:22	0.00%	0 (0.00%)	$0.00 (0.00%)
5. Italy	**1,723** (1.24%)	56.36%	971 (1.18%)	45.91%	4.27	00:03:54	0.00%	0 (0.00%)	$0.00 (0.00%)
6. France	**1,704** (1.23%)	59.92%	1,021 (1.24%)	59.15%	3.05	00:02:36	0.00%	0 (0.00%)	$0.00 (0.00%)
7. Netherlands	**1,643** (1.19%)	64.64%	1,062 (1.29%)	52.04%	3.27	00:02:51	0.00%	0 (0.00%)	$0.00 (0.00%)
8. Australia	**1,548** (1.12%)	62.14%	962 (1.17%)	55.49%	3.24	00:02:24	0.00%	0 (0.00%)	$0.00 (0.00%)
9. United Kingdom	**1,543** (1.11%)	65.33%	1,008 (1.23%)	51.85%	3.41	00:03:08	0.00%	0 (0.00%)	$0.00 (0.00%)
10. Spain	**1,517** (1.09%)	58.60%	889 (1.08%)	50.76%	3.80	00:03:30	0.00%	0 (0.00%)	$0.00 (0.00%)

~35,000 pageviews per month

search.loinc.org unique visitors



Key Publications and Presentations

photo via nicolastathers

Journal of the American Medical Informatics Association Advance Access published February 5, 2015
Deckard J, et al. J Am Med Inform Assoc 2015;0:1–7. doi:10.1093/jamia/ocu012, Perspective

Supporting interoperability of genetic data with LOINC

RECEIVED 3 July 2014
REVISED 17 September 2014
ACCEPTED 24 October 2014

Jamalynne Deckard[1], Clement J McDonald[2], Daniel J Vreeman[1,3]

ABSTRACT

Electronic reporting of genetic testing results is increasing, but they are often represented in diverse formats and naming conventions. Logical Observation Identifiers Names and Codes (LOINC) is a vocabulary standard that provides universal identifiers for laboratory tests and clinical observations. In genetics, LOINC provides codes to improve interoperability in the midst of reporting style transition, including codes for cytogenetic or mutation analysis tests, specific chromosomal alteration or mutation testing, and fully structured discrete genetic test reporting. LOINC terms follow the recommendations and nomenclature of other standards such as the Human Genome Organization Gene Nomenclature Committee's terminology for gene names. In addition to the narrative text they report now, we recommend that laboratories always report as discrete variables chromosome analysis results, genetic variation(s) found, and genetic variation(s) tested for. By adopting and implementing data standards like LOINC, information systems can help care providers and researchers unlock the potential of genetic information for delivering more personalized care.

Key words: Genetics, LOINC, Medical records systems, Clinical laboratory information systems, Vocabulary, controlled

INTRODUCTION

Strong arguments exist for delivering molecular genetic test results to electronic health records (EHRs) as standards-based, structured (computable) electronic reports for clinical and research purposes.[1–4] The fact that most genetic tests apply for a lifetime and may have to be automatically reinterpreted as new knowledge becomes available[3] only strengthens these ar-

answer lists, panels of individual observations, other details like help text, and units of measure.[15] New versions of the standard are published twice yearly. LOINC has been widely adopted as the standard for laboratory test result names in the United States, where it is a national standard,[16,17] and internationally.[18,19] Many genetic test reporting initiatives,[20,21] including the HL7 Clinical Genomics Working Group,[22,23] have

PERSPECTIVE

Deckard J, McDonald CJ, Vreeman DJ. Supporting interoperability of genetic data with LOINC. J Am Med Inform Assoc. 2015 Feb 5. PMID: 25656513.

Learning From the Crowd in Terminology Mapping: The LOINC Experience

Brian E. Dixon, MPA, PhD,[1] John Hook, BS,[2] Daniel J. Vreeman, PT, DPT, MSc[3]*

Lab Med Spring 2015;46:1-7

DOI: 10.1309/LMWJ730SVKTUBAOJ

ABSTRACT

National policies in the United States require the use of standard terminology for data exchange between clinical information systems. However, most electronic health record systems continue to use local and idiosyncratic ways of representing clinical observations. To improve mappings between local terms and standard vocabularies, we sought to make existing mappings (wisdom) from healt care organizations (the Crowd) available to individuals engaged in mapping processes. We developed new functionality to display counts of local terms and organizations that had previously mapped to a given Logical Observation Identifiers Names and Codes (LOINC) code. Further, we enabled users to view the details of those mappings, including local term names and the organizations that create the mappings. Users also would have the capacity to contribute their local mappings to a shared mapping repository. In this article, we describe the new functionality and its availability to implementers who desire resources to make mapping more efficient and effective.

Keywords: logical observation identifiers names and codes, crowdsourcing, controlled vocabulary, health information exchange; electronic health records, clinical laboratory information systems

Abbreviations:

IT, information technology; HIE, health information exchange; US, United States; LOINC, Logical Observation Identifiers Names and Codes; SNOMED CT, Systematized Nomenclature of Medicine–Clinical Terms; IHTSDO, International Health Terminology Standards Development Organisation; EHR, electronic health record; CMS, Centers for Medicare and Medicaid Services; ELR, electronic laboratory reporting; RELMA, Regenstrief LOINC Mapping Assistant; RCMT, Reportable Conditions Mapping Table; VLDL, very-low-density lipoprotein; CDC, Centers for Disease Control and Prevention; LIS, laboratory information system; Qual, qualitative; NCnc, number concentration; ACnc, arbitrary concentration; WHO, World Health Organization; CTSI, Clinical and Translational Sciences Institute; ComMaps, field that displays the number of local test codes mapped to a given candidate LOINC; ComInst, field that displays the number of institutions that have mapped to a given candidate LOINC code; ACnc, arbitrary concentration; Pt, point in time; Ser/Plas, serum/plasma; QN, quantitative; Ord, ordinal; NCnc, number concentration; Probe.amp.tar, probe with target amplification; Prid, presence or identity; Imp, impression; Nom, nominal; LaCnc, log unit concentration; LnCnc, log number concentration; HIV, human immunodeficiency virus; YMDD, tyrosine-methionine-aspartate-aspartate

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Semantic interoperability is the ability for an information technology (IT) system to receive information from another IT system and reliably apply its business rules to the information received.[1] This definition represents a well-established, consensus-based view from the international health information exchange (HIE) community for shared messaging (syntax) and meaning (semantics) between health IT systems. The Center for IT Leadership estimates that among various health IT investments, introducing semantic interoperability would produce the greatest economic benefit to the United States (US) health system.[2] To achieve semantic interoperability, the US health system must adopt and implement consistent clinical messaging and data standards that provide a framework and language for communicating shared meaning.[3] Although messaging (syntax) is critically important, we focus, in this article, on the semantic aspects of interoperability—that is, how systems communicate shared meaning of clinical data.

Standard vocabularies for representing clinical data are now mature and have been internationally adopted.[4] Logical Observation Identifiers Names and Codes (LOINC; Regenstrief Institute, Inc., Indianapolis, IN), for example, provide universal identifiers for laboratory tests and other

Dixon BE, Hook J, Vreeman DJ. Learning From the Crowd in Terminology Mapping: The LOINC Experience. Lab Med. 2015 Spring;46(2):168-74. PMID: 25918199.

Vreeman D J, et al. J Am Med Inform Assoc 2015;0:1–7. doi:10.1093/jamia/ocv098. Research and Applications

Journal of the American Medical Informatics Association Advance Access published July 29, 2015

Learning from the crowd while mapping to LOINC

RECEIVED 23 February 2015
REVISED 4 May 2015
ACCEPTED 8 June 2015

Daniel J Vreeman[1,2], John Hook[3], Brian E Dixon[2,4,5]

ABSTRACT

Objective To describe the perspectives of Regenstrief LOINC Mapping Assistant (RELMA) users before and after the deployment of Community Mapping features, characterize the usage of these new features, and analyze the quality of mappings submitted to the community mapping repository.

Methods We evaluated Logical Observation Identifiers Names and Codes (LOINC) community members' perceptions about new "wisdom of the crowd" information and how they used the new RELMA features. We conducted a pre-launch survey to capture users' perceptions of the proposed functionality of these new features; monitored how the new features and data available via those features were accessed; conducted a follow-up survey about the use of RELMA with the Community Mapping features; and analyzed community mappings using automated methods to detect potential errors.

Results Despite general satisfaction with RELMA, nearly 80% of 155 respondents to our pre-launch survey indicated that having information on how often other users had mapped to a particular LOINC term would be helpful. During the study period, 200 participants logged into the RELMA Community Mapping features an average of 610 times per month and viewed the mapping detail pages a total of 6686 times. Fifty respondents (25%) completed our post-launch survey, and those who accessed the Community Mapping features unanimously indicated that they were useful. Overall, 95.3% of the submitted mappings passed our automated validation checks.

Conclusion When information about other institutions' mappings was made available, study participants who accessed it agreed that it was useful and informed their mapping choices. Our findings suggest that a crowd-sourced repository of mappings is valuable to users who are mapping local terms to LOINC terms.

Keywords: LOINC, Clinical laboratory information systems, medical record systems, vocabulary, controlled

RESEARCH AND APPLICATIONS

Vreeman DJ, Hook J, Dixon BE. Learning from the crowd while mapping to LOINC. J Am Med Inform Assoc. 2015 Jul 29. pii: ocv098. doi: 10.1093/jamia/ocv098. PubMed PMID: 26224334.

MedInfo 2015 Panel (São Paulo, Brazil)

International Perspectives and Strategies for LOINC Adoption

Daniel J. Vreeman
Marivan Santiago Abrahão
Boonchai Kijsanayotin
Maria Teresa Chiaravalloti

My slides:

Introductory Remarks and Overview of LOINC Adoption

Approaches to LOINC Adoption Around the Globe

Top 10 Tips for Mapping to LOINC

Presentation to PCORnet on January 1, 2016

Recommendations to NCVHS on Attachment Standards

Testimony to NCVHS on February 15, 2016

Summarized in Blog Post

Collaboration Agreement with bioMérieux

Phase I: December 2014

Phase II: November 2015

COLLABORATION AGREEMENT

This Collaboration Agreement ("Agreement") is made and entered into by and between:

bioMérieux SA, a corporation organized under the laws of France with its principal office at Chemin de l'Orme, 69280 Marcy l'Etoile, France ("bioMérieux")

and

Regenstrief Institute, a non-profit corporation organized under the laws of the State of Indiana with its principal office at 1050 Wishard Blvd, RG6 Indianapolis, IN 46202, USA ("Partner")

Novel LOINCing contract with IVD company

In 150 countries. 2014 revenue of $1.90 billion

Phase 1 launched in January 2015

Joint announcement

Phase 2 launched 2016

ONC 2016 Interoperability Standards Advisory

Final Version published December 22, 2015

Comments due March 21, 2016

Send me any you want LOINC to consider

I-J: Lab tests

Interoperability Need: Representing numerical laboratory test results (observations)(questions)							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Federally Required**	**Cost**	**Test Tool Availability**
Standard	LOINC	Final	Production	●●●○○	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Value Set(s):
• The HIT Standards Committee recommended that laboratory test and observation work in conjunction with values or results which can be answered numerically or categorically. If the value/result/answer to a laboratory test and observation is categorical that answer should be represented with the SNOMED-CT terminology. • Where LOINC codes do not exist, it is possible to request a new LOINC term be created. A number of factors may determine the length of time required for a new code to be created.	• A value set at this granularity level (numerical) does not exist. The list of LOINC Top 2000+ Lab Observations OID: 1.3.6.1.4.1.12009.10.2.3

I-P: Imaging (Diagnostics, interventions and procedures)

Interoperability Need: Representing imaging diagnostics, interventions and procedures							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Federally Required**	**Cost**	**Test Tool Availability**
Standard	LOINC	Final	Production	●●○○○	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Value Set(s):
• Radlex and LOINC are currently in the process of creating a common data model to link the two standards together to promote standardized indexing of radiology terms as indicated by public comments and HIT Standards Committee recommendations.	• Feedback requested

I-S: Vital Signs

Interoperability Need: Representing patient vital signs							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Federally Required**	**Cost**	**Test Tool Availability**
Standard	LOINC	Final	Production	●●●●●	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Value Set(s):
• Feedback requested	• Vital Sign Result urn:oid:2.16.840.1.113883.3.88.12.80.62

Questions and Answers…

I-D: Race and Ethnicity

Interoperability Need: Representing patient race and ethnicity							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Federally Required**	**Cost**	**Test Tool Availability**
Standard	OMB standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, Oct 30, 1997	Final	Production	●●●●○	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	**Applicable Value Set(s):**
• The CDC Race and Ethnicity Code Set Version 1.0, which expands upon the OMB standards may help to further define race and ethnicity for this interoperability need as it allows for multiple races and ethnicities to be chosen for the same patient. • The high-level race/ethnicity categories in the OMB Standard may be suitable for statistical or epidemiologic or public health reporting purposes but may not be adequate in the pursuit of precision medicine and enhancing therapy or clinical decisions. • LOINC provides observation codes for use in the observation / observation value pattern for communicating race and ethnicity.	• Race (5 codes): Race Category Excluding Nulls urn:oid:2.16.840.1.113883.3.2074.1.1.3 • Race (extended set, 900+codes): Race urn:oid:2.16.840.1.113883.1.11.14914 • Ethnicity: Ethnicity urn:oid:2.16.840.1.114222.4.11.837

Projected Additions to the ISA

Representing patient family health history observations (questions)

Representing patient gender identity observations (questions)

Representing patient sex (at birth) observations (questions)

Representing patient-identified sexual orientation observations (questions)

Representing numerical laboratory test order observations (questions/what will be tested)

Representing nursing assessments

Representing outcomes for nursing

Representing patient tobacco use (smoking status) observations (questions)

FDA Adoption and Promotion of LOINC

2015 to 2016

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

[Docket No. FDA–2004–N–0451]

Food and Drug Administration Modernization Act of 1997: Modifications to the List of Recognized Standards, Recognition List Number: 038

AGENCY: Food and Drug Administration, HHS.

ACTION: Notice.

SUMMARY: The Food and Drug Administration (FDA) is announcing a publication containing modifications the Agency is making to the list of standards FDA recognizes for use in premarket reviews (FDA Recognized consensus standards) that sponsors may use to support marketing applications. The modifications to the list of recognized standards are intended to assist those who elect to declare conformity with consensus standards to meet certain requirements for medical devices.

DATES: Submit either electronic or written comments concerning this document at any time. See section VII of this document for the effective date of the recognition of standards announced in this document.

ADDRESSES: An electronic copy of Recognition List Number: 038 is available on the Internet at *http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Standards/ucm123792.htm*. See section VI of this document for electronic access to the searchable database for the current list of FDA recognized consensus standards, including Recognition List Number: 038 modifications and other standards related information.

Submit written requests for single copies of this document to the Division of Consumer Education, Center for Devices and Radiological Health, Food and Drug Administration, 10903 New Hampshire Ave., Bldg. 66, Rm. 4613, Silver Spring, MD 20993–0002. Send one self-addressed adhesive label to assist that office in processing your request, or fax your request to 301–847–8149.

Submit electronic comments on this document to *http://www.regulations.gov*. Submit written comments to the Division of Dockets Management (HFA–305), Food and Drug Administration, 5630 Fishers Lane, Rm. 1061, Rockville, MD 20852. Identify comments with the docket number found in brackets in the heading of this document.

FOR FURTHER INFORMATION CONTACT: Scott A. Colburn, Center for Devices and Radiological Health, Food and Drug Administration, 10903 New Hampshire Ave., Bldg. 66, Rm. 3632, Silver Spring,

TABLE 2—NEW ENTRIES TO THE LIST OF RECOGNIZED STANDARDS—Continued

Recognition No.	Title of standard [1]	Reference No. and date
	J. Software/Informatics	
13–70	Application of risk management for IT-networks incorporating medical devices—Part 2–5: Application guidance—Guidance on distributed alarm systems.	IEC TR 80001–2–5 2014.
13–71	Logical Observation Identifiers Names and Codes (LOINC)	LOINC 2.48 2014–06–27.
	Part 10425: Device Specialization—Continuous Glucose Monitor (CGM).	
	K. Sterility	
14–456	Packaging for terminally sterilized medical devices—Guidance on the application of ISO 11607–1 and ISO 11607–2.	ISO/TS 16775 First edition 2014–05–15.

[1] All standard titles in this table conform to the style requirements of the respective organizations.

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

Workshops & Conferences (Medical Devices)

2016 Medical Device Meetings and Workshops

2015 Medical Device Meetings and Workshops

Medical Device Webinars and Stakeholder Calls

Public Workshop FDA/CDC/NLM Workshop on Promoting Semantic Interoperability of Laboratory Data, September 28, 2015

The Food and Drug Administration (FDA), the Centers for Disease Control and Prevention (CDC), and the National Library of Medicine (NLM) of the National Institutes of Health are announcing the following public workshop titled "FDA/CDC/NLM Workshop on Promoting Semantic Interoperability of Laboratory Data."

The purpose of the workshop was to receive and discuss input from stakeholders regarding proposed approaches to promoting the semantic interoperability of laboratory data between *in vitro* diagnostic devices and database systems, including laboratory information systems and electronic health records.

- Discussion Paper
- Date, Time and Location
- Federal Register Notice
- Webcast
- Transcript
- Agenda

Design Considerations and Pre-market Submission Recommendations for Interoperable Medical Devices

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Draft Guidance for Industry and Food and Drug Administration Staff

DRAFT GUIDANCE

This guidance document is being distributed for comment purposes only.
Document issued on: January 26, 2016

Submit comments and suggestions regarding this draft document within 60 days of publication in the *Federal Register* of the notice announcing the availability of the draft guidance. Submit electronic comments to http://www.regulations.gov. Submit written comments to the Division of Dockets Management (HFA-305), Food and Drug Administration, 5630 Fishers Lane, rm. 1061, Rockville, MD 20852. Identify all comments with the docket number listed in the notice of availability that publishes in the *Federal Register*.

For questions about this document regarding CDRH-regulated devices, email them to: DigitalHealth@fda.hhs.gov;
For questions about this document regarding CBER-regulated devices, contact the Office of Communication, Outreach and Development (OCOD), by calling 1-800-835-4709 or 240-402-8010

U.S. Department of Health and Human Services
Food and Drug Administration
Center for Devices and Radiological Health
Center for Biologics Evaluation and Research

FEDERAL REGISTER

Meaningful Use Stage 3

Part II

Department of Health and Human Services

Office of the Secretary

45 CFR Part 170

2015 Edition Health Information Technology (Health IT) Certification Criteria, 2015 Edition Base Electronic Health Record (EHR) Definition, and ONC Health IT Certification Program Modifications; Final Rule

FEDERAL REGISTER

Vol. 80 Friday,
No. 200 October 16, 2015

87 mentions of LOINC.

Part II

Department of Health and Human Services

Office of the Secretary

45 CFR Part 170

2015 Edition Health Information Technology (Health IT) Certification Criteria, 2015 Edition Base Electronic Health Record (EHR) Definition, and ONC Health IT Certification Program Modifications; Final Rule

2015 Edition Criteria NOT Adopted

We have not adopted this certification criterion as part of the 2015 Edition at this time. We have made this determination based on a number of factors, including (among other aspects) that this criterion is no longer referenced by the EHR Incentive Programs and that the best versions of the IGs (LRI and EHR-S Functional Requirements for LRI) that could be associated with this criterion are not sufficiently ready.

Electronic Submission of Medical Documentation

2015 Edition Criteria Unchanged from 2014

Computerized Provider Order Entry (CPOE)—Medications

CPOE—Laboratory

CPOE—Diagnostic Imaging

No standards adopted

Drug-Drug, Drug-Allergy Interaction Checks for CPOE

Medication List

Medication Allergy List

Drug-Formulary and Preferred Drug List Checks

Smoking Status

Authentication, Access Control, Authorization

Audit Report(s)

Amendments

Automatic Access Time-Out

Emergency Access

End-User Device Encryption

Accounting of Disclosures

Transmission to Public Health Agencies—Reportable Laboratory Tests and Values/Results

2015 Edition Criteria Revised from 2014

Demographics

Problem List

Clinical Decision Support

Family Health History

Patient-Specific Education Resources

Transitions of Care

Clinical Information Reconciliation and Incorporation

Electronic Prescribing

Data Export

Clinical Quality Measures—Record and Export

Clinical Quality Measures—Import and Calculate

Clinical Quality Measures—Report

View, Download, and Transmit to 3rd Party

Transmission to Immunization Registries

Transmission to Public Health Agencies—Syndromic Surveillance

Transmission to Cancer Registries

Automated Numerator Recording

Automated Measure Calculation

Safety-enhanced Design

Quality Management System

Auditable Events and Tamper-Resistance*

Integrity*

Secure Messaging*

Direct Project*

Direct Project, Edge Protocol, and XDR/XDM*

2015 Edition Criteria New Since 2014

Implantable Device List

Social, Psychological, and Behavioral Data

Data Segmentation for Privacy—Send

Data Segmentation for Privacy—Receive

Care Plan

Common Clinical Data Set Summary Record—Create

Common Clinical Data Set Summary Record—Receive

Clinical Quality Measures—Filter

Trusted Connection

API approach

Auditing Actions on Health Information

Patient Health Information Capture

Transmission to Public Health Agencies—Electronic Case Reporting

Transmission to Public Health Agencies—Antimicrobial Use and Resistance Reporting

Transmission to Public Health Agencies—Health Care Surveys

Consolidated CDA Creation Performance

Application Access—Patient Selection

Application Access—Data Category Request

Application Access—All Data Request

Accessibility—centered Design

Social, Psychological, and Behavioral Data

Financial resource strain

Education

Stress

Depression

Physical activity

Alcohol use

Social connection and isolation

Exposure to violence

All have specific LOINC codes identified

publication of a subsequent final rule. Please further note that we propose to include sexual orientation and gender identity within this certification criterion as described after this table.

Domain	Question(s) [LOINC® name]	Answer(s) [LOINC® answer code]	LOINC® Codes for question-answer list combination	LOINC® Answer list ID
Financial Resource Strain (Overall financial resource strain from CARDIA).	How hard is it for you to pay for the very basics like food, housing, medical care, and heating? Would you say it is . . .	For example: Very hard, Somewhat hard, Not hard, at all.[56]	LOINC® code pending.	LOINC® code pending.
Education (Educational attainment).	What is the highest level of school you have completed or the highest degree you have received? [57]	[0] Never attended/kindergarten only [1] 1st grade [2] 2nd grade [3] 3rd grade [4] 4th grade [5] 5th grade [6] 6th grade. [7] 7th grade. [8] 8th grade. [9] 9th grade. [10] 10th grade. [11] 11th grade. [12] 12th grade, no diploma. [13] High school graduate. [14] GED or equivalent. [15] Some college, no degree. [16] Associate degree: occupational, technical, or vocational program. [17] Associate degree; academic program. [18] Bachelor's degree (e.g., BA, AB, BS). [19] Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA). [20] Professional school degree (example: MD, DDS, DVM, JD). [21] Doctoral degree (example: PhD, EdD). [77] Refused. [99] Don't know.	63504–5	LL1069–5.
Stress (from Elo et al) [58]	Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of stress these days?	For example: Likert scale ranging from 1—indicating not at all, 2—a little bit, 3—somewhat, 4—quite a bit, to 5—indicating very much.	LOINC® code pending.	LOINC® code pending.
Depression (PHQ–2)	[Patient Health Questionnaire 2 item (PHQ–2) [Reported]].	N/A	55757–9	N/A.
	Little interest or pleasure in doing things in last 2 weeks [Reported.PHQ].	[0] Not at all, [1] Several days, [2] More than half the days, [3] Nearly every day.	44250–9	LL358–3.
	Feeling down, depressed or hopeless in last 2 weeks [Reported.PHQ].	[0] Not at all, [1] Several days, [2] More than half the days, [3] Nearly every day.	44255–8	LL358–3.
	[Patient Health Questionnaire 2 item (PHQ–2) total score [Reported]].	For example: 0–6	5578–7	Answer is in UCUM units.[59]
Physical Activity (Exercise Vital Signs).	How many days of moderate to strenuous exercise, like a brisk walk, did you do in the last 7 days? [SAMHSA].	For example: 1,2,3,4,5,6,7, etc.	68515–6	Answer is in UCUM units.[60]
	On those days that you engage in moderate to strenuous exercise, how many minutes, on average, do you exercise? [SAMHSA].	For example: 10, 20, etc.	68516–4	Answer is in UCUM units.
Alcohol Use (AUDIT–C)	[Alcohol Use Disorder Identification Test—Consumption [AUDIT–C].	N/A	72109–2	N/A.

Domain	Question(s) [LOINC® name]	Answer(s) [LOINC® answer code]	LOINC® Codes for question-answer list combination	LOINC® Answer list ID
	How often do you have a drink containing alcohol? [SAMHSA].	[a] Never [b] Monthly or less [c] 2–4 times a month [d] 2–3 times a week [e] 4 or more times a week	68518–0	LL2179–1.
	How many standard drinks containing alcohol do you have on a typical day? [SAMHSA].	[a] 1 or 2 [b] 3 or 4 [c] 5 or 6 [d] 7 to 9 [e] 10 or more	68519–8	LL2180–9.
	How often do you have six or more drinks on one occasion? [SAMHSA].	[a] Never [b] Less than monthly [c] Monthly [d] Weekly [e] Daily or almost daily	68520–6	LL2181–7.
	[Total score [AUDIT–C]]	N/A [61]		N/A.
Social Connection and Isolation (NHANES III).	Are you married or living together with someone in a partnership at the time of questioning? In a typical week, how many times do you talk on the telephone with family, friends, or neighbors? How often do you get together with friends or relatives? How often do you attend church or religious services? How often do you attend meetings of the clubs or organizations you belong to?	For example, these categories form an ordinal scale assessing the number of types of social relationships on which a person is connected and not isolated, and has standard scoring. Individuals receive one point for each of the following: Being married or living together with someone in a partnership at the time of questioning, averaging three or more social interactions per week (assessed with questions one and two, above), reporting attending church or other religious services more than four times per year (assessed with question three, above), and reporting that they belong to a club or organization (assess with question four, above). A score of 0 represents the highest level of social isolation and a score of 4 represents the lowest level of social isolation. [62]	LOINC® code pending.	LOINC® code pending.
Exposure to violence: Intimate partner violence (HARK 4Q).	Within the last year, have you been humiliated or emotionally abused in other ways by your partner or ex-partner? Within the last year, have you been afraid of your partner or ex-partner? Within the last year, have you been raped or forced to have any kind of sexual activity by your partner or ex-partner? Within the last year, have you been kicked, hit, slapped, or otherwise physically hurt by your partner or ex-partner?	Pending	LOINC® code pending.	LOINC® code pending.

We propose to require that a Health IT Module enable a user to record, change, and access a patient's sexual orientation and gender identity as part of this certification criterion. We propose that sexual orientation be coded in accordance with, at a minimum, the September 2014 Release of the U.S. Edition of SNOMED CT® [63] and HL7 Version 3 attributed as follows:

[56] The answer is then scored from a scale of 1 (very hard) to 3 (not at all), and unknown answers are scored as a negative number.

[57] LOINC® Component used for the table.

[58] Elo, A.-L., A. Leppänen, and A. Jahkola. 2003. Validity of a single-item measure of stress symptoms. *Scandanavian Journal of Work, Environment & Health* 29(6):444–451.

[59] Note that LOINC® provides a translation table at *https://loinc.org/downloads/usage/units* that enumerates the UCUM syntax for a subset of UCUM codes that are commonly used in health IT that may be a useful reference for stakeholders.

[60] Note that LOINC® provides a translation table at *https://loinc.org/downloads/usage/units* that enumerates the UCUM syntax for a subset of UCUM codes that are commonly used in health IT that may be a useful reference for stakeholders.

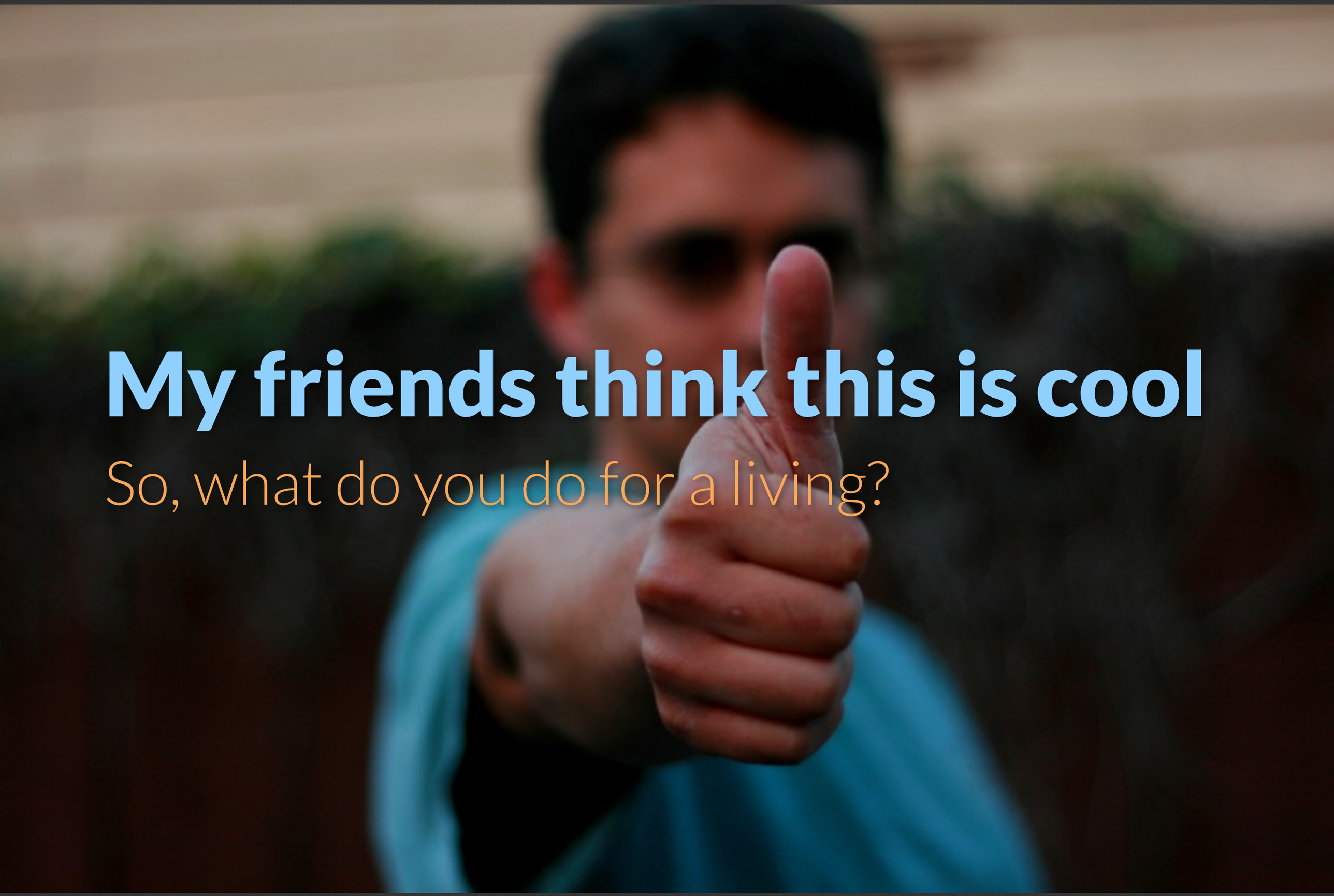
[61] The Alcohol Use Disorders Identification Test C (AUDIT–C) is scored on a scale of 0 to 12. Each of the three AUDIT–C questions has 5 answer choices with points ranging from 0 to 4. A screen is considered positive for unhealthy alcohol use or hazardous drinking if the AUDIT–C score is 4 or more points for men or 3 or more points for women.

[62] Pantell et al., 2013.

80216-5 Social, psychological and behavioral observations - 2015 Edition Health IT Certification Criteria set

PANEL HIERARCHY (view this panel in the LForms viewer)

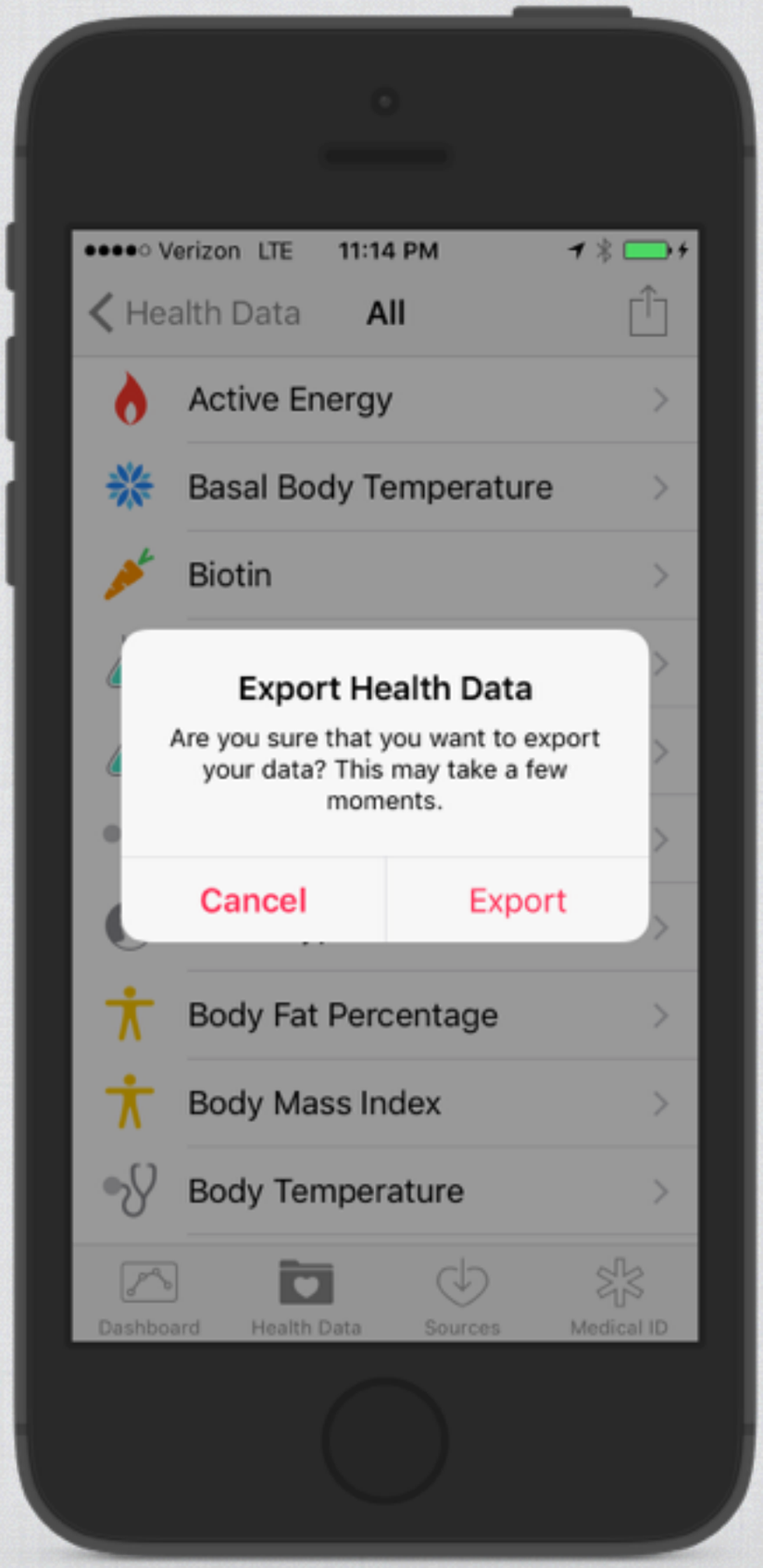
LOINC#	LOINC Name	R/O/C	Cardinality	Ex. UCUM Units
80216-5	Social, psychological and behavioral observations - 2015 Edition Health IT Certification Criteria set			
76513-1	How hard is it for you to pay for the very basics like food, housing, medical care, and heating?			
63504-5	What is the highest grade or level of school you have completed or the highest degree you have received?			
76542-0	Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of stress these days?			
55757-9	Patient Health Questionnaire 2 item (PHQ-2) [Reported]			
44250-9	Little interest or pleasure in doing things?			
44255-8	Feeling down, depressed, or hopeless?			
55758-7	Patient Health Questionnaire 2 item (PHQ-2) total score [Reported]			{score}
68515-6	How many days of moderate to strenuous exercise , like a brisk walk, did you do in the last 7 days?			d/(7.d)
68516-4	On those days that you engage in moderate to strenuous exercise, how many minutes, on average, do you exercise?			min/d
72109-2	Alcohol Use Disorder Identification Test - Consumption [AUDIT-C]			
68518-0	How often do you have a drink containing alcohol?			
68519-8	How many standard drinks containing alcohol do you have on a typical day?			{#}/d
68520-6	How often do you have 6 or more drinks on 1 occasion?			
75626-2	Total score [AUDIT-C]			{score}
76506-5	Social connection and isolation panel			
63503-7	Are you now married, widowed, divorced, separated, never married or living with a partner?			
76508-1	In a typical week, how many times do you talk on the telephone with family, friends, or neighbors?			{#}/wk
76509-9	How often do you get together with friends or relatives?			/wk
76510-7	How often do you attend church or religious services?			/a
76511-5	Do you belong to any clubs or organizations such as church groups unions, fraternal or athletic groups, or school groups?			
76512-3	Social isolation score [NHANES]			{score}
76499-3	Humiliation, Afraid, Rape, and Kick questionnaire [HARK]			
76500-8	Within the last year, have you been humiliated or emotionally abused in other ways by your partner or ex-partner?			
76501-6	Within the last year, have you been afraid of your partner or ex-partner?			
76502-4	Within the last year, have you been raped or forced to have any kind of sexual activity by your partner or ex-partner?			
76503-2	Within the last year, have you been kicked, hit, slapped, or otherwise physically hurt by your partner or ex-partner?			
76504-0	Total score [HARK]			{score}



My friends think this is cool

So, what do you do for a living?

photo via DieselDemon


Verizon LTE 11:14 PM
Health Data
All
Active Energy
Basal Body Temperature
Biotin
Export Health Data
Are you sure that you want to export your data? This may take a few moments.
Cancel
Export
Body Fat Percentage
Body Mass Index
Body Temperature
Dashboard
Health Data
Sources
Medical ID

LOINC codes! Oh snap!

```
<observation classCode="OBS" moodCode="EVN">
 <templateId root="2.16.840.1.113883.10.20.22.4.27"/>
 <id root="[illegible]"/>
 <code code="8867-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Heart rate"/>
 <text>
  <sourceName>Health</sourceName>
  <sourceVersion>9.2</sourceVersion>
  <value>72</value>
  <type>HKQuantityTypeIdentifierHeartRate</type>
  <unit>count/min</unit>
  <metadataEntry>
   <key>HKWasUserEntered</key>
   <value>1</value>
  </metadataEntry>
 </text>
 <statusCode code="completed"/>
 <effectiveTime>
  <low value="20160108133900-0500"/>
  <high value="20160108133900-0500"/>
 </effectiveTime>
 <value xsi:type="PQ" value="72" unit="count/min"/>
 <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"/>
</observation>
</component>
```

Apple Health Export in C-CDA Format

LOINC and RELMA Release Highlights

http://loinc.org/news/loinc-version-2-54-and-relma-version-6-12-available.html/

File Changes

Two previously announced changes to the LOINC table:

Field Name: DATE_LAST_CHANGED
Definition: Date the LOINC term was last changed.
Action: Deleted

Field Name: VersionLastChanged
Formal Definition: The LOINC version number in which the record has last changed. For new records, this field contains the same value as the loinc.FirstPublishedRelease field.
Action: Added

Content Highlights

Swapna Abhyankar, MD

Committee Best Practice

Update to new LOINC versions within 90 days

Translations

New Linguistic Variant File

A set of linguistic variants in CSV text format

Each linguistic variant file is identified by its ISO language and country codes.

The LinguisticVariants table that lists the available linguistic variants in CSV text format

The LOINC License in a text file format

Updated Linguistic Variants

Chinese (China)

Dutch (Netherlands)

French (Canada)

French (France)

Italian (Italy)

New Linguistic Variant

German (Austria)

RELMA Highlights

New Lucene (search line) tricks

VersionLastChanged and **chng_type** provides a convenient way to find see the new and updated terms with each release. Examples:

versionlastchanged:2.54

versionlastchanged:2.54 -chngtype:add

New Order Code value set. We have added the expanded Common Lab Order Codes value set from the S&I Framework aLOINC Order Code Initiative.

See LOINC codes in this list with a query like:

commonlaborder:true

A few other fields added to the searchable Lucene index (see release notes).

Collaboration Update

IEEE (heard)

RSNA (coming)

IHTSDO

IHTSDO

Continue EPG meetings

Have requested and proposed a contract amendment to allow us to distribute SNOMED CT codes for answers outside of the initial domain areas.

(Last week we received permission…we think)

Trying to engage to prevent duplicative work in radiology and functioning observables.

Using LOINC and SNOMED CT Together without Overlap

Presentation at SNOMED CT Expo 2015 in Montevideo, Uruguay

IHTSDO

Technology Preview release September 2015

3 Formats: RF2, OWL, Excel (with term names!)

14736 LOINC Terms associated with SNOMED CT post-coordinated Expressions

4400 LOINC Part to SNOMED CT mappings

Covers majority (around 75%) of the Top 2000 LOINC Lab Observations and Parts needed to represent them.

1500+ SNOMED CT codes added to produce the expressions