

EHR-National Standardization Initiative

National Resource Centre for EHR Standards (NRCeS)
C-DAC Pune

Background

- Ministry of Health & Family Welfare (MoHFW) notified the Electronic Health Record (EHR) Standards for India in Sept 2013
- The notified standards were not only supported by professional bodies, regulatory bodies, stakeholders, but various technical and social commentators also
- Revised EHR Standards for India were notified in Dec 2016

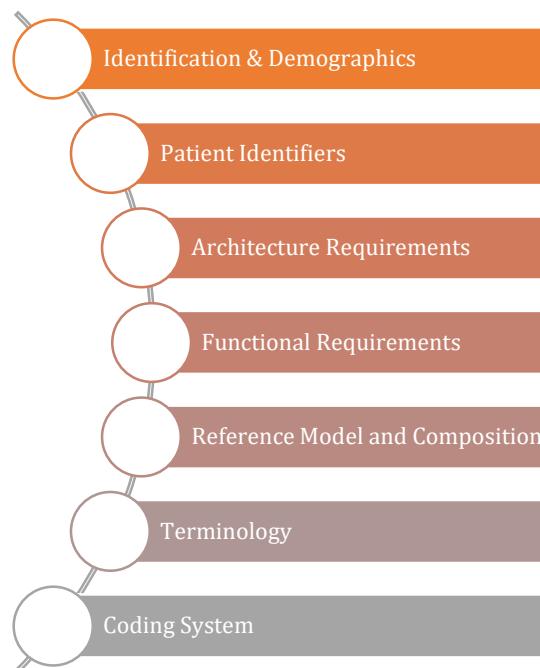


EHR Standards for India 2016 - Highlights

- EHR Standards for India (2016) provides a structured overview of the key EHR standards with respect to Indian healthcare system
- Detailed recommendation on the various aspects of EHR systems standardization perspective
- Short guideline regarding implementation specific to the item-in-context included
- It is understood that with proper adoption interoperability of both meaning and data can be achieved.
- Aim: *Any person in India can go to any health service provider/practitioner, any diagnostic centre or any pharmacy and yet be able to access and have fully integrated and always available health records in an electronic format*

EHR Standards at a Glance

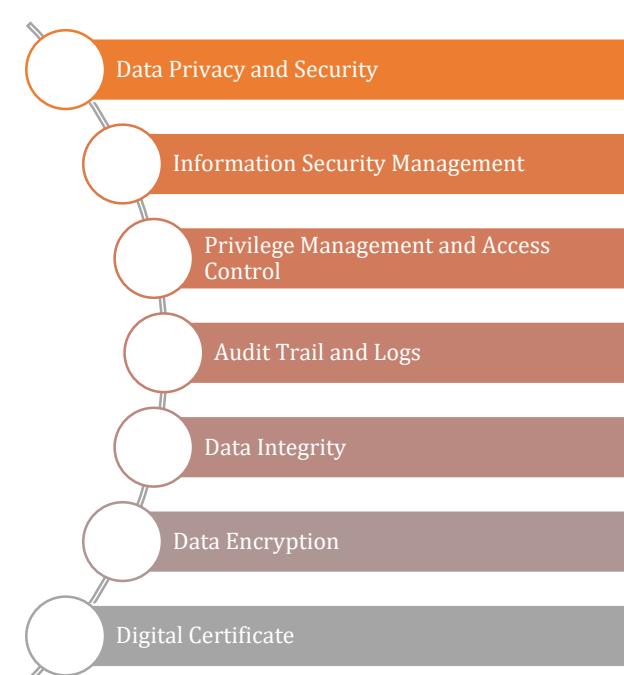
Architecture and Data Content



Information Exchange



Security and Privacy



Initiatives towards Adoption of EHR Standards

- **India has become a member of SNOMED International (also IHTSDO)** in April 2014 with a view of widespread adoption of SNOMED CT in our country
- MoH&FW, Govt. of India had set-up **National Release Centre (NRC) for SNOMED CT** in September 2014 at C-DAC Pune
- MoH&FW, Govt. of India has set-up a Centre of Excellence for promotion and adoption of notified EHR Standards in healthcare applications as **National Resource Centre for EHR Standards (NRCeS)** in February 2017 at C-DAC Pune
- A major initiative to set up **National Digital Health Authority (NDHA)** of India is underway with a vision to ensure adoption of e-Health and related standards in India in an orderly manner

National Release Centre (NRC) for SNOMED CT

- Within their own countries,
 - NRCs manage the use of SNOMED CT
 - Communicate with a range of stakeholders, including SNOMED CT Affiliate Licensees, healthcare institutions, clinical groups and end users
- NRC for SNOMED CT in India: **C-DAC Pune** (www.snomedctnrc.in)
 - Conduct workshops and trainings to promote usage of SNOMED CT
 - Provide free & open source tools and resources for use and adoption of SNOMED CT in EHR
 - Assist in implementation of SNOMED CT by vendors and hospitals
 - Develop national Refsets and Extensions for ease of adoption
- NRC is a single point of contact for communications with SNOMED International and other SNOMED International Members

SNOMED CT

- It is the **richest vocabulary** available to describe clinical findings, diseases, procedures etc.
- Contains **443,237 concepts**, more than 1.3 million descriptions and more than two and a half million relationships.
- Recommended as the terminology standard to be used for precisely representing clinical information across the scope of health care.
- SNOMED CT aims at transmitting all concepts that have been expressed throughout history in the healthcare domain, unambiguously.
- Used to code, retrieve, and analyze clinical data.

SNOMED CT Benefits

Individual

- Consistent, common representation of clinical information
- Enable guideline and decision support systems to provide real time advice
- Support appropriate information sharing
- Allow accurate and comprehensive searches

Population

- Facilitate early identification of emerging issues
- Enable accurate and targeted access to relevant information
- Enable delivery of relevant data for clinical research
- Enhance audits of care delivery

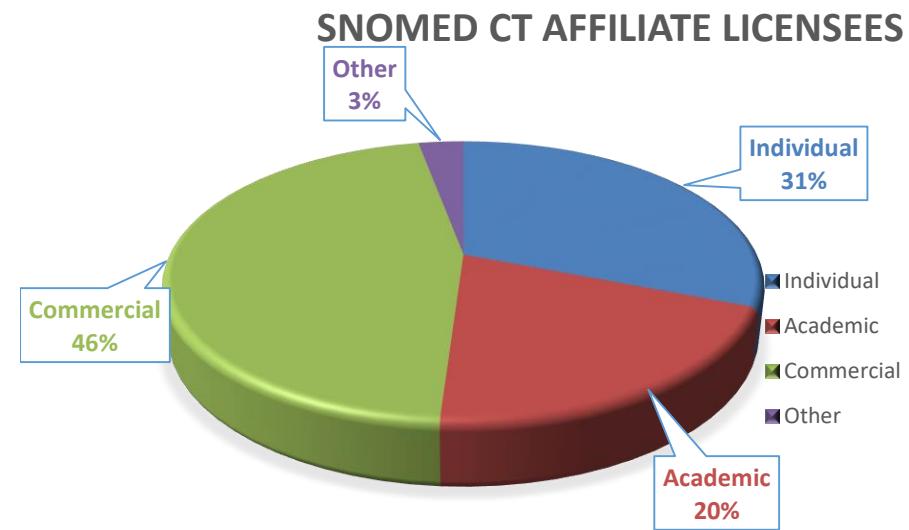
Evidence Based Healthcare Decisions

- Link clinical records and clinical guidelines and protocols
- Enhance individual quality of care
- Reduce costs of inappropriate and duplicative testing
- Raise cost effectiveness and quality of care of populations

SNOMED CT Adoption & Implementation Status

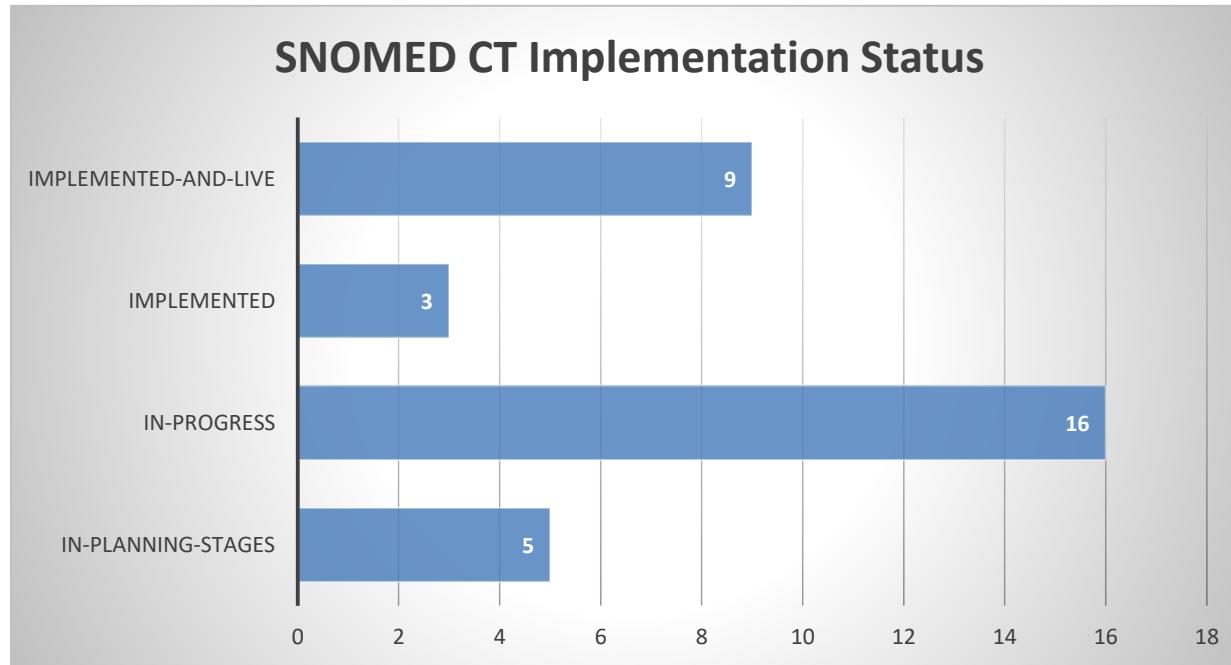
239 Affiliate Licensees from various parts of the country has been issued

- 113 Vendors have reported implementation of SNOMED CT
- 26 Hospital have reported integration of SNOMED CT
- 8 Institutes/ Colleges for Study & Research
- 18 State Government/R&D initiatives for integrating SNOMED CT
- 74 Individual Affiliate licensees



Note: This is the partial list of the affiliate licensees as on October 2017

SNOMED CT Implementation Status



as on October 2017

Major Implementation Supported

- **eHospital** – Hospital Information Management System (HMIS) deployed across various states in the country
- **PHRMS** – MeitY funded project for development and deployment of PHR system
- **Megh Sushrut** – new edition of HMIS deployed across various hospitals and states
- **Kerala eHealth Project** – HMIS application used in Kerala state under eHealth Project
- **AIIMS eDeath Note** - Used for recording event of death and generating death certificate, OPD form, print card, and international death form
- Manorama Infosolutions Pvt. Ltd for integration in HMIS
- HealthQik for integration in Electronic Medical Records (EMR)
- E3 Systems Pvt. Ltd for integration in HIMS
- Softlink International for integration in Panacea software

Scope: SNOMED CT



EHR Standards



National Release Centre
India



National Resource Centre
for EHR Standards
India

National Resource Centre for EHR Standards (NRCeS)

- Facilitate adoption of the entire set of notified EHR Standards in the country, Ministry has set-up “National Resource Centre for EHR Standards (NRCeS)” at Centre for Development of Advanced Computing (C-DAC), Pune
- Provide assistance in developing, implementing and using EHR standards effectively in healthcare applications in India
- Support the proposed National Digital Health Authority (NDHA) to facilitate adoption of EHR related standards in an orderly manner



NRCeS Activities

Tools and Technologies

Software tools and resources for use and adoption of EHR Standards

Education and Training

Promotion and proliferation for use of EHR standards

Implementation Support

Assistance to vendors and hospitals.
User and License management of standards

National Releases

Manage Reference sets and Extensions

Liaison with SDOs

Co-ordination with national and international Standards Development Organizations

Advisory and Consultation

Assistance in process/best practice adoption in implementing healthcare application

NRCeS – Your Friend in EHR Standardization



Tools and Technologies



- Free and open source standard enabled software tools
- Free and open source SDKs for ease of implementing/ enabling standards within healthcare systems
 - SNOMED CT Toolkit (CSNOtk)
 - SDK for ANSI/HL7 v2.8.2-2015
 - SDK for DICOM PS3.0-2015
 - available from C-DAC at www.cdac.in (sdk-eng@cdac.in)
- Utilities, applications, sample codes, middleware components for demonstrating integration approaches
 - PoCs for specific use case, technology, platform, etc.
- Tools for mapping, conversions, interoperability, etc. for use and quick adoption of EHR Standards
 - SNOMED CT to ICD-10 mapping APIs

Education and Training



- Workshop for Healthcare professionals (Clinicians, Nurses, Hospital IT Staff, Paramedics, etc.) on EHR Standards and benefits
- Workshop for Vendors and Implementers on EHR Standards and technical implementation
- On-demand need-based training to hospitals, vendors, and implementers
- Workshop/Training to policy makers, departments, educational institutes, organizations, consortiums, associations, etc. on sensitizing about EHR Standards
- Specialized trainings on creation and validation of national releases and extensions
- Training on using and integrating SDKs and tools
- e-Learning videos and materials



Implementation Support



- Assistance in design and integration of EHR Standards in application
- Approaches for integration of EHR Standards in to their existing healthcare applications
- Assistance in getting SNOMED CT release files and Affiliate License for the use of SNOMED CT Standard within India
- Case studies, discussion papers, guidance documents for implementation and assistance in setting and using the developed tools and SDKs
- Peer review of EHR standard enabled software developed by vendors
- One point contact for implementation support: nrc-help@cdac.in

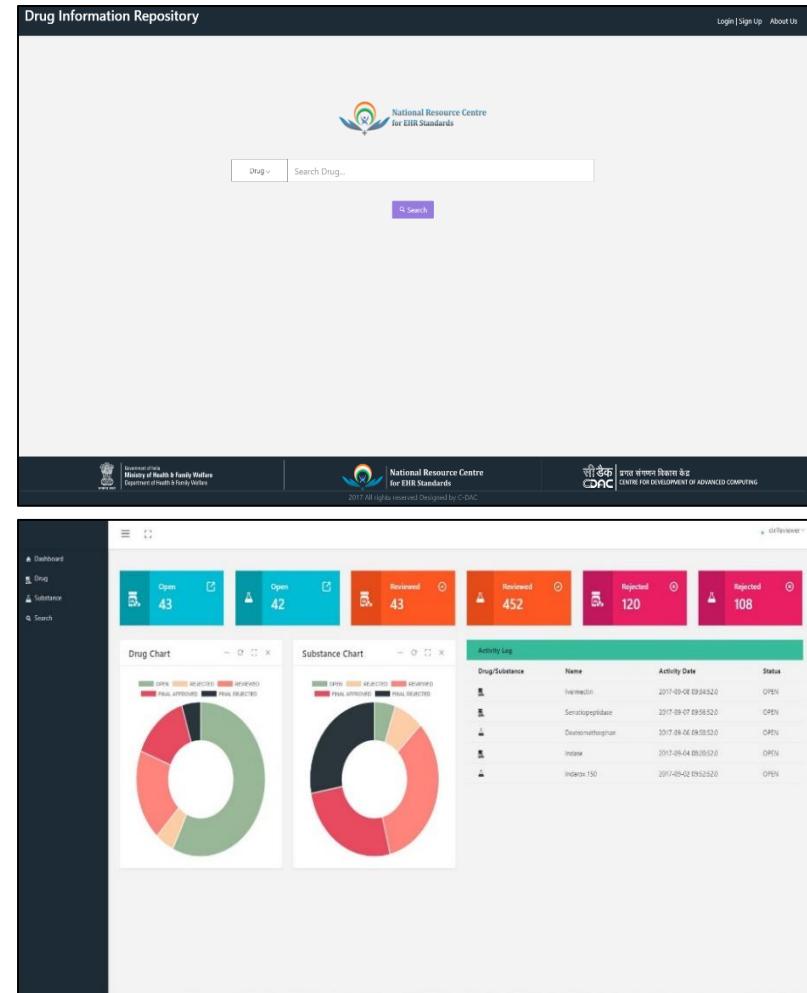
National Releases



- SNOMED CT national refsets
 - Preview Refsets for oral cancer, cervical cancer, cataract, diarrhoea, pregnancy related anaemia, malaria and tuberculosis are released and can be downloaded from SNOMED International MLDS account by licensees
 - Additional 14+ refsets are planned for release
- National Drug Extension for SNOMED CT
- Country specific customizations to EHR standards
- Manage and maintain national releases
- Assists in development of vendor / implementer specific subsets / refsets

Drug Information Repository (DIR)

- Primarily developed for collecting drug information which will be used as corpus for development of National Drug Extension of SNOMED CT for use in India
- Provides a secured platform for users (medical, pharmaceutical and experts) to add drug and substance information
- Includes workflow for curating and reviewing contents for completeness and correctness
- Over time with more collection of data, the DIR could additionally serve as information reference about drugs and substances in India



The screenshot displays the Drug Information Repository (DIR) interface. At the top, there is a navigation bar with links for 'Login', 'Sign Up', and 'About Us'. Below the navigation bar is a search bar with a dropdown menu set to 'Drug' and a search button. The main content area features several data visualizations and summary tables. On the left, a sidebar shows navigation links for 'Dashboard', 'Drug', 'Definition', and 'Search'. The central part of the screen includes:

- A 'Drug Chart' and a 'Substance Chart' each with two donut charts showing data distribution across categories like 'Open', 'Rejected', 'Reviewed', and 'Final Approved'.
- A 'Summary' section with four colored boxes: 'Open' (43), 'Rejected' (43), 'Reviewed' (452), and 'Rejected' (120).
- An 'Activity Log' table listing recent activities:

Drug/Substance	Name	Activity Date	Status
Imreton	2017-07-08 09:34:52.0	OPEN	
Sertralopride	2017-07-07 09:58:52.0	OPEN	
Quinacrine	2017-07-06 09:58:52.0	OPEN	
Indole-150	2017-07-02 09:52:52.0	OPEN	

Liaison with SDOs



- Co-ordinate with national and international Standards Development Organizations (SDOs)
- Interact with peer bodies in states to learn and leverage exposure about EHR standards
- Participate in development and evolution of EHR standards
- Act as a bridge between SDOs, MoHFW, vendors and hospitals, and end users
- Consolidate and report requests, queries, concerns about EHR standards to national health authority
- NRCEs/C-DAC is represented at BIS (India) and ISO (through BIS)
- NRCEs/C-DAC is now member of HL7 Organization, LOINC Standard Committee, openEHR Foundation, DICOM Committee

Advisory & Consultation



- Consulting/advisory services for strategic approach and advice on healthcare system implementation and adoption
- Assistance in process/best practice adoption in implementing healthcare application
- Assistance in defining roadmap/ strategy in healthcare application development to both the government and private sector

NRCeS Statistics



SNOMED CT Affiliate
Licenses

239



Workshops and Trainings

48



National Refsets for
SNOMED CT

7



Tools Downloads

500



Consultations

12



People Trained

2795

As of October 2017

EHR Standards Resources

- Available at: www.nrcees.in
- One-stop information portal regarding all aspects of EHR Standards includes information, implementation and adherence
- Resources such as documents, tools downloads, presentations, videos etc., information on relevant events, workshops, and conferences
- Brief and detailed information on each notified Standard under EHR Standards for India 2016
- Dashboard for the status and statistics of the activates of NRCEs



Thank You

nrc-help@cdac.in