



**MedDRA**

# MedDRA and Ontology

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MedDRA

# What is MedDRA?

Med = Medical

D = Dictionary for

R = Regulatory

A = Activities





MedDRA

# What Is MedDRA Used For?

- To support registration, documentation & safety monitoring of medicinal products, by providing:
  - Standardised communication between industry and regulators
    - Within regions and between regions
  - Support for electronic submissions
    - Individual Case Safety Report (ICSR)
    - Electronic Common Technical Document (eCTD)
  - Improvements in the quality and timeliness of data available for effective analysis, exchange and decision making



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# Who Are MedDRA Users?

- Regulatory authorities
  - US FDA
  - Europe: EMA and National Competent Authorities
  - MHLW (Japan)
  - And others
- Biopharmaceutical industry
- Academic and research institutions
- Clinical research organizations
- Other organizations dedicated to public health



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# Governance of MedDRA





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# Structure of MedDRA

- MedDRA Scope is defined and its structure is designed specifically for its purpose
  - To support registration, documentation & safety monitoring of medicinal products





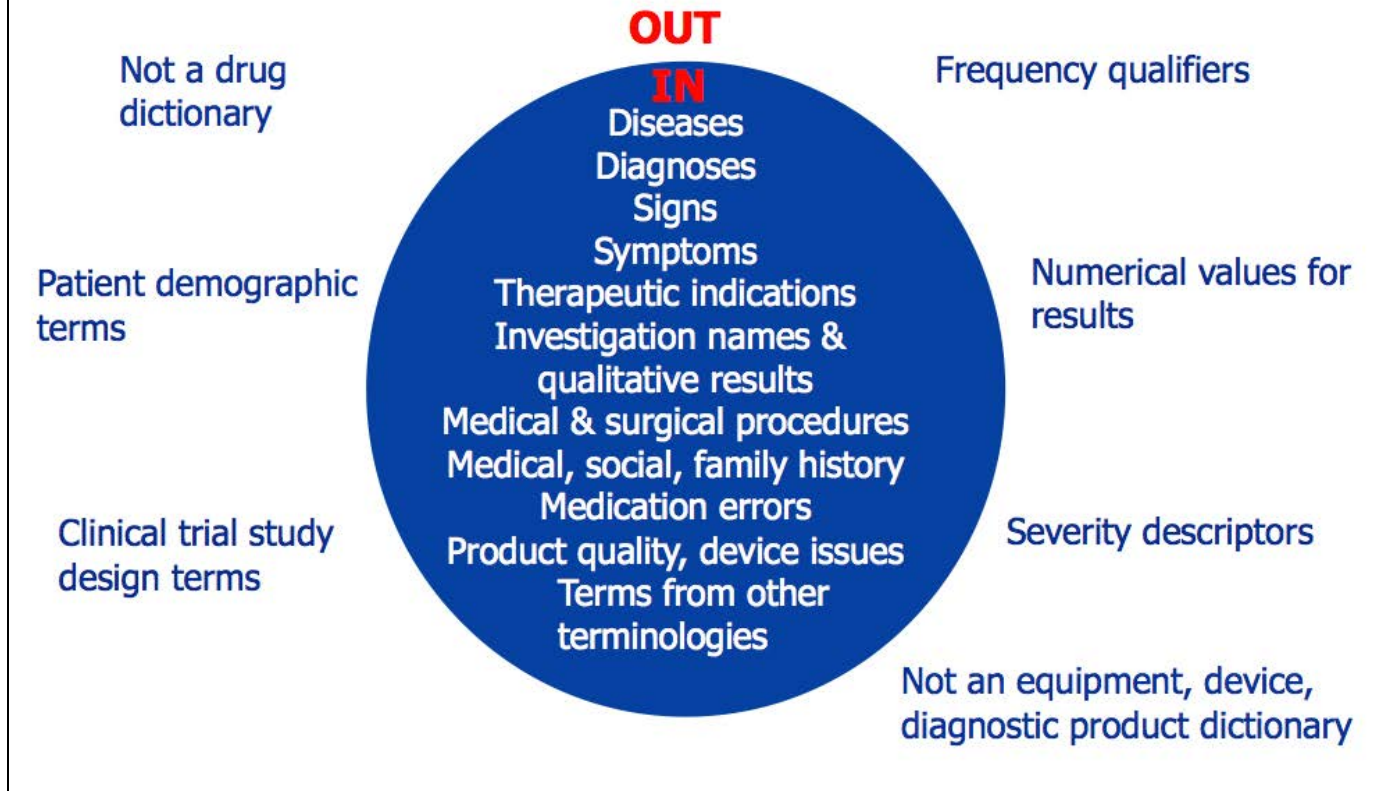
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# Scope of MedDRA

- Standardized medical terminology to facilitate sharing of regulatory information internationally for medical products used by humans
  - In the context of MedDRA, "product" can refer to various types of products intended for humans
    - Drugs (prescription and over the counter)
    - Biologics
    - Vaccines
    - Combination products
    - Devices
    - Nutraceuticals
    - Dietary supplements



## Scope of MedDRA







# MedDRA Hierarchical Structure

System Organ Class (SOC) (26)

High Level Group Term (HLGT) (334)

High Level Term (HLT) (1,720)

Preferred Term (PT) (20,808)

Lowest Level Term (LLT) (73,221)

Standardised MedDRA  
Queries (SMQs) (96)



# MedDRA System Organ Classes

- Blood and lymphatic system disorders
- Cardiac disorders
- Congenital, familial and genetic disorders
- Ear and labyrinth disorders
- Endocrine disorders
- Eye disorders
- Gastrointestinal disorders
- General disorders and administration site conditions
- Hepatobiliary disorders
- Immune system disorders
- Infections and infestations
- Injury, poisoning and procedural complications
- Investigations
- Metabolism and nutrition disorders
- Musculoskeletal and connective tissue disorders
- Neoplasms benign, malignant and unspecified (incl cysts and polyps)
- Nervous system disorders
- Pregnancy, puerperium and perinatal conditions
- Psychiatric disorders
- Renal and urinary disorders
- Reproductive system and breast disorders
- Respiratory, thoracic and mediastinal disorders
- Skin and subcutaneous tissue disorders
- Social circumstances
- Surgical and medical procedures
- Vascular disorders



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# MedDRA Hierarchy Example

SOC = Cardiac disorders

HLGT = Cardiac arrhythmias

HLT = Rate and rhythm disorders NEC

PT = Arrhythmia

LLT  
Arrhythmia  
NOS

LLT  
Arrhythmia

LLT (Non-current)  
Other specified cardiac  
dysrhythmias

LLT  
Dysrhythmias



# A Multi-Axial Terminology

- Multi-axial = the representation of a medical concept in multiple SOC's
  - Allows grouping by different classifications
  - Allows retrieval and presentation via different data sets
- Purpose of Primary SOC
  - Determines which SOC will represent a PT during cumulative data outputs
  - Is used to support consistent data presentation for reporting to regulators



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# A Multi-Axial Terminology (cont)

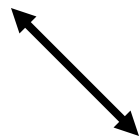
SOC = Respiratory, thoracic and  
mediastinal disorders



HLGT = Respiratory tract  
infections



HLT = Viral upper respiratory  
tract infections



PT = Influenza

SOC = Infections and  
infestations



HLGT = Viral infectious  
disorders



HLT = Influenza viral  
infections





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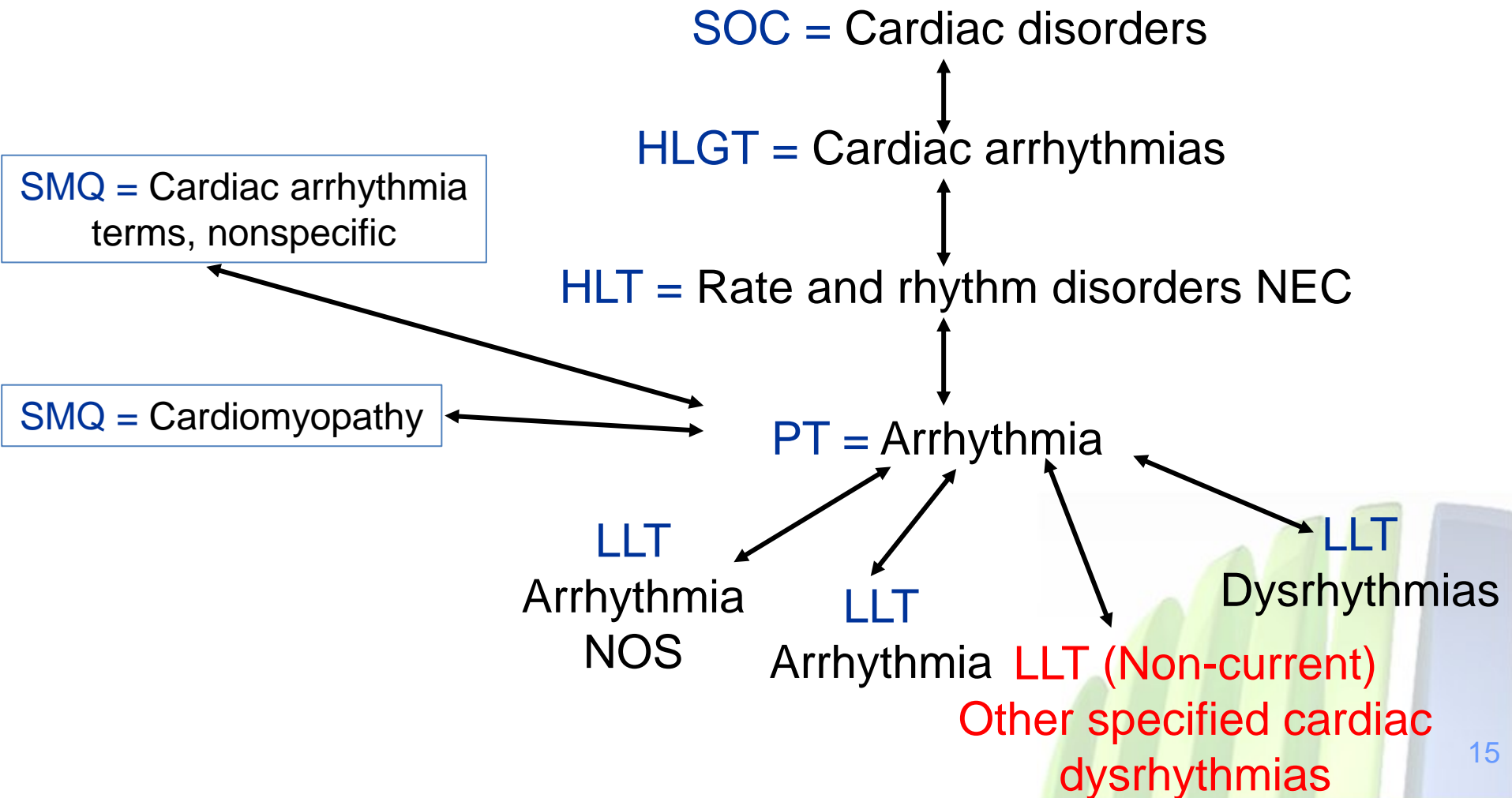
# MedDRA SMQs

- SMQs are MedDRA analytical tools
- Groupings of terms from one or more MedDRA System Organ Classes (SOCs) related to defined medical condition or area of interest
- Included terms may relate to signs, symptoms, diagnoses, syndromes, physical findings, laboratory and other physiologic test data, etc., related to medical condition or area of interest
- Aid in case identification and signal detection



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# MedDRA Hierarchy with SMQs Example





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# SMQs in Production - Examples

- As of Version 17.1, a total of 96 in production
  - Agranulocytosis
  - Anaphylactic reaction
  - Cerebrovascular disorders
  - Convulsions
  - Depression and suicide/self-injury
  - Hepatic disorders
  - Hypersensitivity
  - Ischaemic heart disease
  - Lack of efficacy/effect
  - Osteonecrosis
  - Peripheral neuropathy
  - Pregnancy and neonatal topics
  - Pseudomembranous colitis
  - Rhabdomyolysis/myopathy
  - Severe cutaneous adverse reactions
  - Systemic lupus erythematosus





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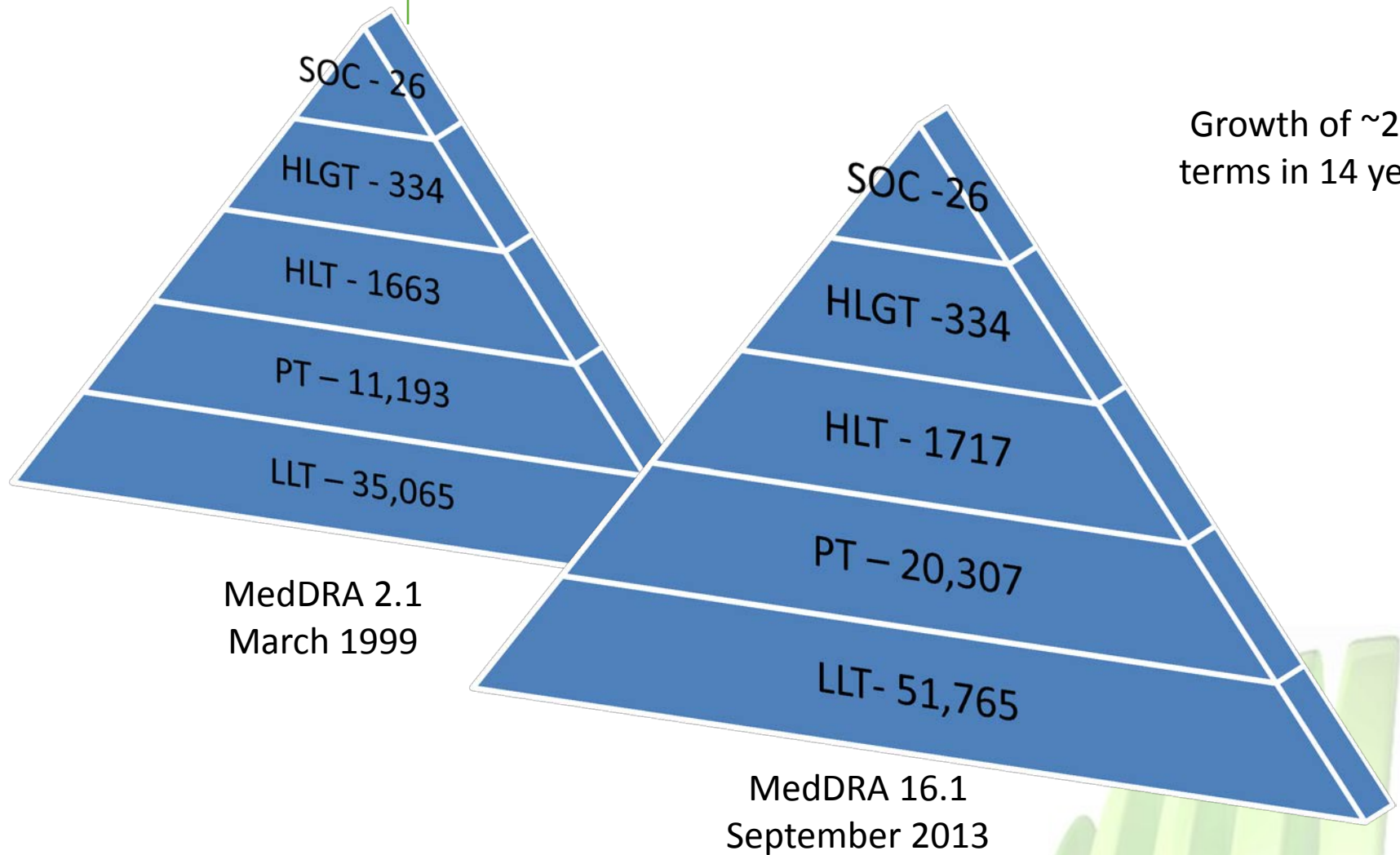
# Maintenance

- Rigorous maintenance through a change request process including international medical review
- MSSO and JMO started operations in late 1998
  - First release was MedDRA 2.1 in March 1999
- Maintenance rules were established and made available to users



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# MedDRA Evolution



Growth of ~26K terms in 14 years



March 1999

- Distributed on CD or Diskette
- No regulatory requirements
- No coding or analysis guidance available
- 9 Special Search Categories
- Big effort to convert people, systems, and databases

# MedDRA Evolution (cont.)

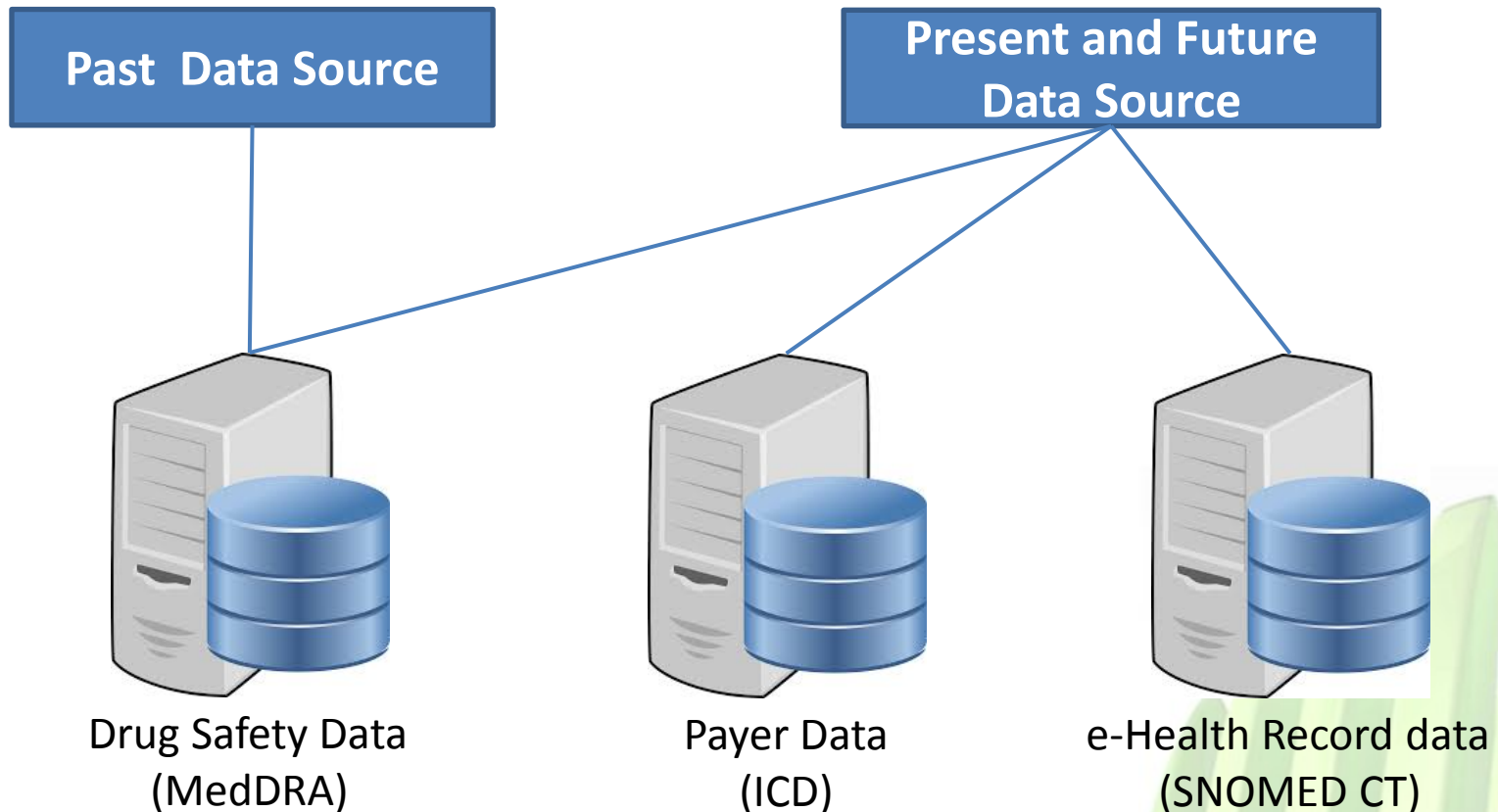


September 2014

- Web distribution
- Mandated by law or practice
- Points to Consider documents for coding and analysis
- 96 Standardised MedDRA Queries (SMQs) are available
- MedDRA is an international standard

# Pharmacovigilance Data Sources

- Expanding to sources of observational data (big data analysis)



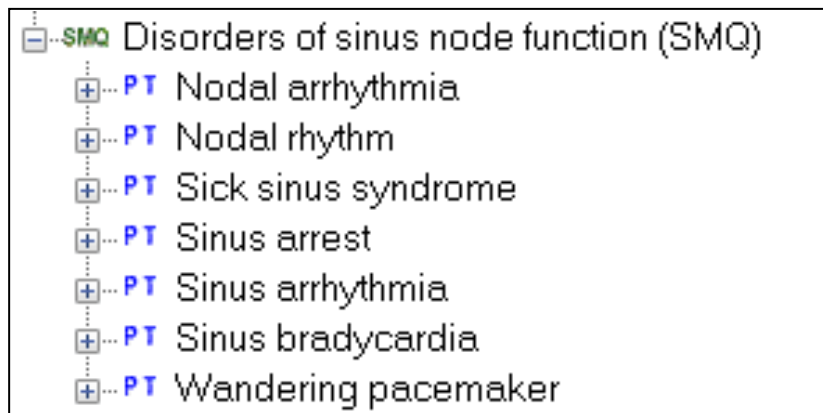


# Interoperability of MedDRA

- Big data analysis – a use case of MedDRA's interoperability with others
  - MEDLINE (MeSH)
  - Payer data (ICD-9-CM)
  - e-Health data (SNOMED CT)
  - Clinical trial and post-market surveillance (MedDRA)
- Interoperability with other medical terminologies
  - In UMLS, MedDRA terms are linked to terms of other terminologies under the same ConceptID
    - Terminologies: ICDs, SNOMED CT
  - Mappings extracted from UMLS need substantial manual curation
- Could the implementation of MedDRA in an ontological framework improve the accuracy of the mappings? If so, how?

# Facilitating Data Retrieval and Analysis

- Defining a clinical event of interest by a group of relevant MedDRA terms
  - Example: SMQs



A definition term list

- The clinical event can be
  - A drug safety concern
  - A labeled event



# Facilitating Data Retrieval and Analysis

- The definition term list of the clinical event helps
  - To retrieve relevant cases in drug safety surveillance and pharmacovigilance
  - To identify if a newly reported event is labeled or unlabeled
- Can adding ontological features to MedDRA help to create quality definition term lists in MedDRA? If so, how?



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# Enhancing MedDRA Translations

- MedDRA translations
  - MedDRA is available in 11 languages including English
  - English MedDRA is the master file
  - Other languages are the mirror translation of English master
  - Challenge: non-English language may have more synonyms of a concept than English
- Adding concept IDs in MedDRA offers the placeholders for synonyms unique to a particular language





**MedDRA**

Medical Dictionary  
for Regulatory Activities

Questions?

