

# 201933 - SNOMED to ICD-10 mapping for implementation in disease registries

Sukanya Rangamani, Manju Mahadevashetty, Arulmani Thiyagarajan, Ashitha Dsouza, Anish John, Priyanka Das, Prashant Mathur  
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## INTRODUCTION & METHODOLOGY

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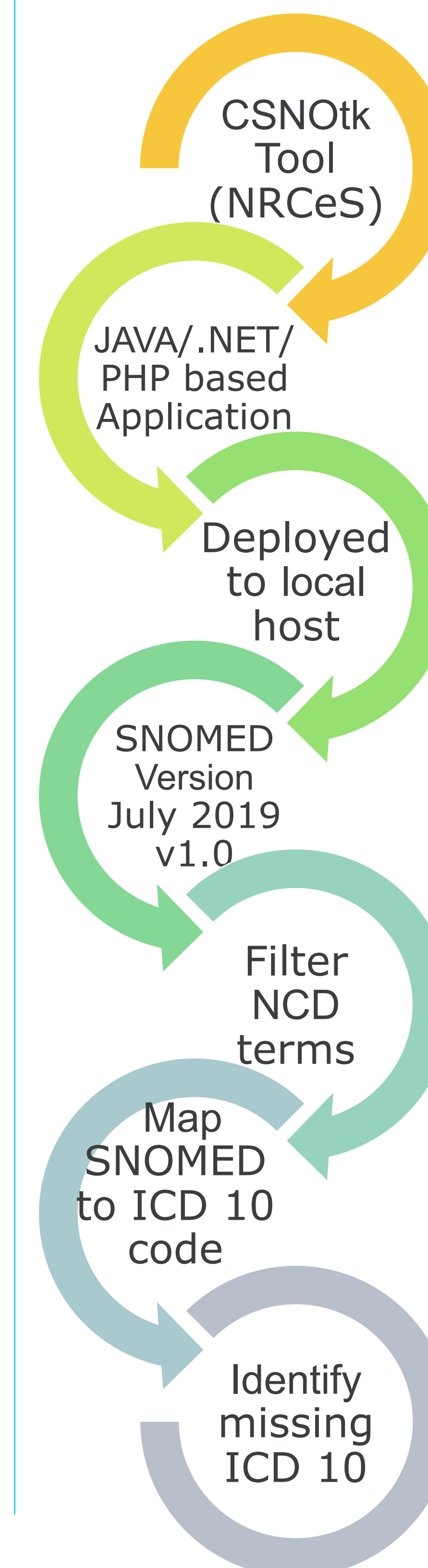
### INTRODUCTION

- SNOMED CT mapping is extensive, flexible for input of clinical terms but may be incomplete in certain unmapped ICD 10 codes. The mapping from SNOMED CT to International Classification of Diseases – 10 (ICD-10) is necessary for disease reporting systems.
- The Morphology of Malignant Neoplasms, which is a nomenclature of codes designed for use in conjunction with Chapter 11 Neoplasms, has not been included in the MAP.(1)
- SNOMED CT to ICD 10 mapping needs to be examined prior to its integration as standardised input terms in disease surveillance systems such as disease registries.
- This paper examines completeness of SNOMED CT to ICD 10 mapping for Malignant neoplasms, Diabetes mellitus and Diseases of circulatory system.

### OBJECTIVES

- To understand the completeness of mapping of SNOMED CT to ICD -10 classification for specific non-communicable diseases.
- To identify gaps in mapping of SNOMED CT to ICD-10 coding for reporting non-communicable diseases particularly diseases of cardiovascular system, diabetes and malignant neoplasm.
- To examine the feasibility of integration of SNOMED CT into disease registries for non-communicable diseases.

### Methodology



Malignant Neoplasm	
ICD 10	No. of SNOMED CT descriptions (n)
C00-C75 Malignant neoplasms, stated or presumed to be primary, of specified sites, except of lymphoid, haematopoietic and related tissue	4785
C76-C80 Malignant neoplasms of ill-defined, secondary and unspecified sites	2015
C81-C96 Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue	1639
C97-C97 Malignant neoplasms of independent (primary) multiple sites	2
Total no. of 8441 SNOMED CT descriptions are mapped to 463 ICD-10 codes	

Diabetes	
ICD 10	No. of SNOMED CT descriptions (n)
E10 Insulin-dependent diabetes mellitus	229
E11 Non-insulin-dependent diabetes mellitus	281
E12 Malnutrition-related diabetes mellitus	14
E13 Other specified diabetes mellitus	70
E14 Unspecified diabetes mellitus	574
Total no. of 1168 SNOMED CT descriptions are mapped to 43 ICD-10 codes	

1. Campbell, J. "Mapping SNOMED CT to ICD-10, Technical Specifications.", (2015): 7

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Diseases of Circulatory System	
ICD 10	No. of SNOMED CT descriptions (n)
<b>I00-I02 Acute rheumatic fever</b>	44
<b>I05-I09 Chronic rheumatic heart diseases</b>	199
<b>I10-I15 Hypertensive diseases</b>	192
<b>I20-I25 Ischaemic heart diseases</b>	537
<b>I26-I28 Pulmonary heart disease and diseases of pulmonary circulation</b>	226
<b>I30-I52 Other forms of heart disease</b>	1930
<b>I60-I69 Cerebrovascular diseases</b>	1049
<b>I70-I79 Diseases of arteries, arterioles and capillaries</b>	1195
<b>I80-I89 Diseases of veins, lymphatic vessels and lymph nodes, not elsewhere classified</b>	858
<b>I95-I99 Other and unspecified disorders of the circulatory system</b>	201
<b>Total no. of 6431 SNOMED CT descriptions are mapped to 378 ICD-10 codes</b>	

### Unmapped ICD-10 Codes

C06.8 Overlapping lesion of other and unspecified parts of mouth
C57.7 Other specified female genital organs
C82.4 Follicular lymphoma grade IIIb
C82.7 Other types of follicular lymphoma
C91.8 Mature B-cell leukaemia Burkitt-type
E12.6 Malnutrition-related diabetes mellitus with other specified complications
E12.8 Malnutrition-related diabetes mellitus with unspecified complications
E13.1 Other specified diabetes mellitus with ketoacidosis
E13.2 Other specified diabetes mellitus with renal complications
E13.4 Other specified diabetes mellitus with neurological complications
E13.5 Other specified diabetes mellitus with peripheral circulatory complications
E13.7 Other specified diabetes mellitus with multiple complications
I01.9 Acute rheumatic heart disease, unspecified
I06.8 Other rheumatic aortic valve diseases
I22.8 Subsequent myocardial infarction of other sites
I25.0 Atherosclerotic cardiovascular disease, so described
I27.1 Kyphoscoliotic heart disease
I39.4 Multiple valve disorders in diseases classified elsewhere
I45.0 Right fascicular block
I52.1 Other heart disorders in other infectious and parasitic diseases classified elsewhere
I66.4 Occlusion and stenosis of multiple and bilateral cerebral arteries
I68.8 Other cerebrovascular disorders in diseases classified elsewhere

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### Incompatible SNOMED CT Mapping to ICD 10 codes

	SNOMED Concept Id	Description	ICD-10 (map target)	Remarks
1.	9859006	Type 2 diabetes mellitus with acanthosis nigricans	E10.9	E10 is restricted to type 1 diabetes
2.	420436000	Mononeuropathy associated with type II diabetes mellitus	E10.4	
3.	420436000	Mononeuropathy associated with type 2 diabetes mellitus	E10.4	
4.	420436000	Mononeuropathy co-occurrent and due to type 2 diabetes mellitus	E10.4	
5.	420436000	Mononeuropathy with type 2 diabetes mellitus	E10.4	
6	194828000	Stenocardia	I20.9	Should be mapped to I20.8
7	45650007	Kyphoscoliotic heart disease	I27.9	Should be mapped to I27.1
8	59118001	Right fascicular block	I45.1	Should be mapped to I45.0
9	195236009	Occlusion and stenosis of multiple and bilateral cerebral arteries	I66.9	Should be mapped to I66.4

### ICD-10 descriptions missing in SNOMED CT

ICD-10 Codes	Missing descriptions
<b>C04.0</b> Anterior floor of mouth	Anterior to the premolar-canine junction
<b>C18.0</b> Caecum	Ileocaecal valve
<b>C20</b> Malignant neoplasm of rectum	Rectal ampulla
<b>C21.1</b> Anal canal	Anal sphincter
<b>C22.3</b> Angiosarcoma of liver	Kupffer cell sarcoma
<b>C25.7</b> Other parts of pancreas	Neck of pancreas
<b>C32.0</b> Glottis	intrinsic larynx
<b>C57.0</b> Fallopian tube	Oviduct, Uterine tube
<b>C57.8</b> Overlapping lesion of female genital organs	Tubo-ovarian, Utero-ovarian
<b>C67.5</b> Bladder neck	Internal urethral orifice
<b>C93.1</b> Chronic myelomonocytic leukaemia	CMML-1, CMML-2
<b>E10.0</b> Type 1 diabetes mellitus With coma	Hyperglycaemic coma
<b>E11.0</b> Type 2 diabetes mellitus With coma	Hyperglycaemic coma
<b>E12.0</b> Malnutrition-related diabetes mellitus With coma	hypoglycaemic coma, Hyperglycaemic coma, hyperosmolar coma, coma with or without ketoacidosis
<b>E13.0</b> Other specified diabetes mellitus with coma	hypoglycaemic coma, Hyperglycaemic coma, coma with or without ketoacidosis
<b>E14.0</b> Unspecified diabetes mellitus With coma	Hyperglycaemic coma NOS

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## DISCUSSION

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	ICD-10	Additional SNOMED Description (Anatomical site)
1	C01 Malignant neoplasm of base of tongue	Malignant tumour of tongue posterior to vallate papillae
2	C24.1 Ampulla of Vater	Malignant neoplasm of sphincter of Oddi

	ICD-10	Additional SNOMED Description (Clinical terms)
1	C25.4 Endocrine pancreas	malignant insulinoma
2	C49.0 Connective and soft tissue of head, face and neck	sarcoma of skull
3	I00 Rheumatic fever without mention of heart involvement	Migratory polyarthritis
4	I01.8 Other acute rheumatic heart disease Any condition in I00 with other or multiple types of heart involvement Acute rheumatic pancarditis	MacCallum's patch MacCallum's plaque

	ICD-10	Additional SNOMED Description (Syndromes)
1	C25.0 Head of pancreas	Bard-Pic syndrome
2	I10 Essential (primary) hypertension	Bilginturan brachydactyly, Bilginturan syndrome, Brachydactyly type E

	ICD-10	Additional SNOMED Description (Specific genetic/bio markers)
1	C19 Malignant neoplasm of rectosigmoid junction	dMMR colorectal cancer, MSI-H colorectal cancer
2	C50.9 Breast, unspecified	Human epidermal growth factor 2 (HER2) negative carcinoma of breast

### DISCUSSION

- >95 % ICD codes have SNOMED CT descriptions mapped in Diseases of neoplasm ( C00-C97)and circulatory system ( I00-I99)
- Seven ICD-10 codes ( E10-E14) are not mapped to SNOMED CT terms
- Incompatible SNOMED CT to ICD 10 mapping found in Diabetes (5 terms) and in Diseases of Circulatory system ( 4 terms)
- Though there are additional SNOMED terms for specific ICD codes, there are ICD descriptions that are missed in SNOMED descriptions
- SNOMED terms relevant to above NCDs that are not mapped to ICD codes are 677 ( neoplasms), 472 ( circulatory system) and 112 ( diabetes).SNOMED terms that define and describe NCDs need to be mapped to ICD 10 codes.

### CONCLUSION

- This study helps in identifying gaps in the translation of coding systems ( SNOMED to ICD ). These could be addressed to improve coding accuracy, especially in the context of the global preparedness for ICD-11 classification.