

SNOMED CT **Induced Classifications**

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Outline

17th Century Analytics : The old way

20th Century Analytics : The current way

21st Century Analytics : A new way?

17th Century Analytics

A code for each thing you want to count
 London Bills of Mortality (1603-)

LONDON'S Dreadful Visitation:
 Or, A COLLECTION of All the
Bills of Mortality
 For this Present Year:
 Beginning the 27th of December 1664. and
 ending the 19th. of December following:
 As also, The GENERAL or whole years BILL:
 According to the Report made to the
 KING'S Most Excellent Majesty,
 By the Company of Parish-Clerks of London. &c

LONDON:
 Printed and are to be sold by E. Coles living in Aldersgate-street.
 Printer to the said Company 1665.

The Diseases and Casualties this Week

Infants	13
King's evil	2
Leprosie	1
Meagrome	1
Mother	1
Plague	2817
Pleurisie	1
Purples	2
Quintic	3
Rickets	24
Rising of the Lights	32
Rupture	3
Scouring	3
Scurvy	3
Spotted Fever	174
Stilborn	11
Stone	3
Stopping of the Stomach	10
Suddenly	2
Surfeits	85
Teeth	90
Thrush	4
Tiffick	3
Ulcer	3
Vomiting	1
Wormes	18

Abortive	5
Aged	36
Apoplexie	1
Childbed	25
Chirumes	22
Consumption	130
Convulsion	58
Cough	2
Distracted	1
Dropic	32
Drownd in a Ditch at Savoyers Southwork	1
Fever	314
Flux and Small-pox	11
Flux	1
Grief	3
Gripping in the Guts	70
Jaundies	2
Imposthume	16

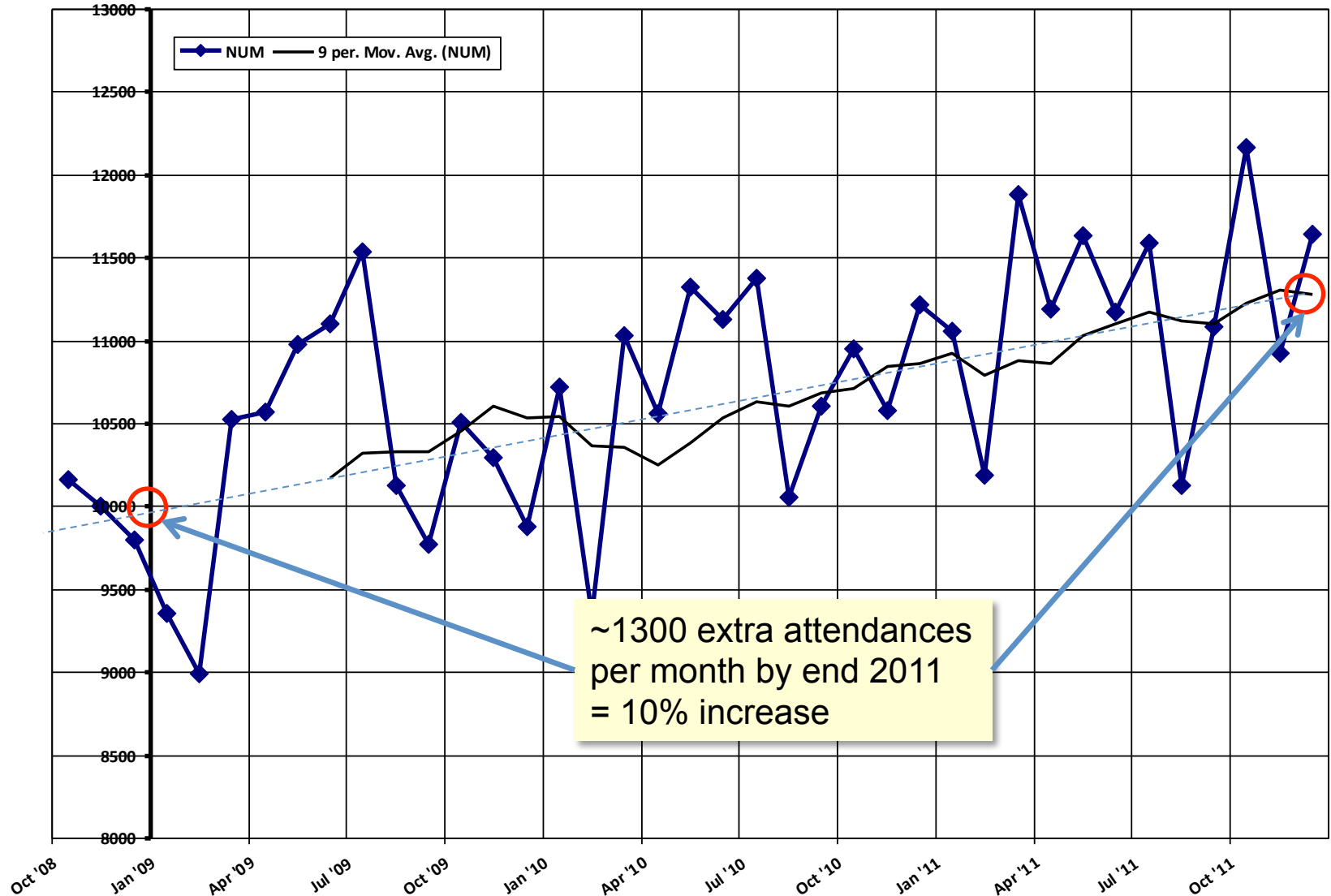
Christned	90	Males	2021
	88	Females	2008
	178	In all	4030

Increased in the Burials this Week 1016.
 Parishes clear of the Plague 44, Parishes Infected 86

The Assize of Bread set forth by Order of the Lord Mayor and Courts of Aldermen.
 A penny Wheaten Loaf to contain Nine Ounces and a half, and three
 half-penny White Loaves the like weight.

39 Months of A&E Data...

12,022 distinct SCT codes used at least once



Choices for aggregation...

ED Dataset (39 categories)

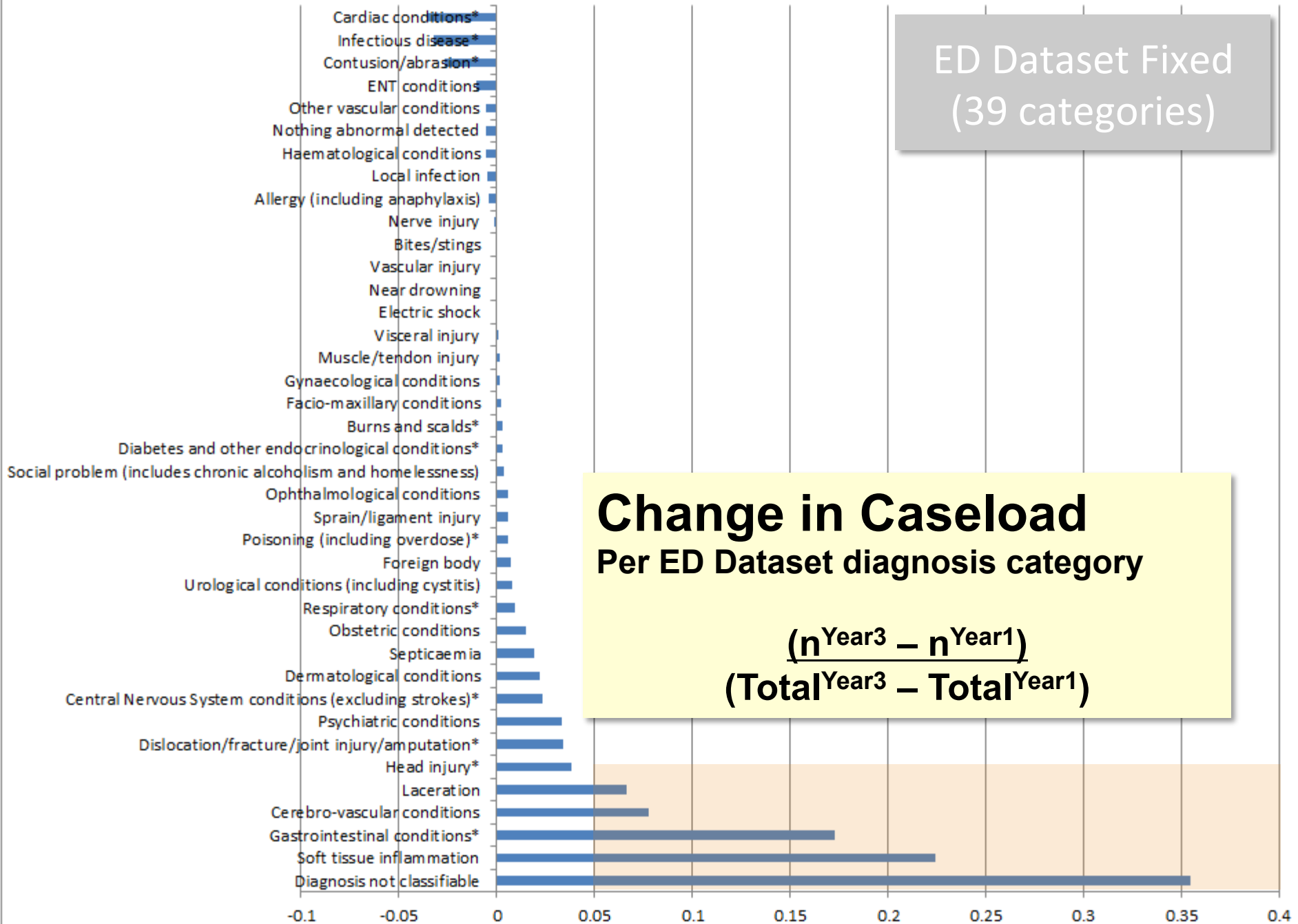
90% of 417,211 episodes map to one of 38 ED dataset codes

- Low granularity
- High(ish) coverage .. 10% of activity lost to this analysis

18666	01 Laceration	5488	20 Cardiac conditions*
7150	02 Contusion/abrasion*	2773	21 Cerebro-vascular conditions
43853	03 Soft tissue inflammation	6087	22 Other vascular conditions
16602	04 Head injury*	Change in Caseload Per ED Dataset diagnosis category $\frac{(n^{\text{Year3}} - n^{\text{Year1}})}{(\text{Total}^{\text{Year3}} - \text{Total}^{\text{Year1}})}$	
21210	05 Dislocation/fracture/joint injury/amputation*		
10827	06 Sprain/ligament injury		
1733	07 Muscle/tendon injury		
254	08 Nerve injury		
8	09 Vascular injury		
2779	10 Burns and scalds*		
92	11 Electric shock		
4928	12 Foreign body		
1876	13 Bites/stings		
3730	14 Poisoning (including overdose)*	3148	32 Allergy (including anaphylaxis)
7	15 Near drowning	1279	33 Facio-maxillary conditions
77	16 Visceral injury	9828	34 ENT conditions
25308	17 Infectious disease*	8148	35 Psychiatric conditions
8323	18 Local infection	4181	36 Ophthalmological conditions
1557	19 Septicaemia	598	37 Social problem (includes chronic alcoholism and homelessness)
		83569	38 Diagnosis not classifiable
		468	39 Nothing abnormal detected

ED Dataset Fixed
(39 categories)

Change in Caseload
Per ED Dataset diagnosis category

$$\frac{(n^{\text{Year3}} - n^{\text{Year1}})}{(\text{Total}^{\text{Year3}} - \text{Total}^{\text{Year1}})}$$


Outline

17th Century Analytics : The old way

Pre-hoc static categories

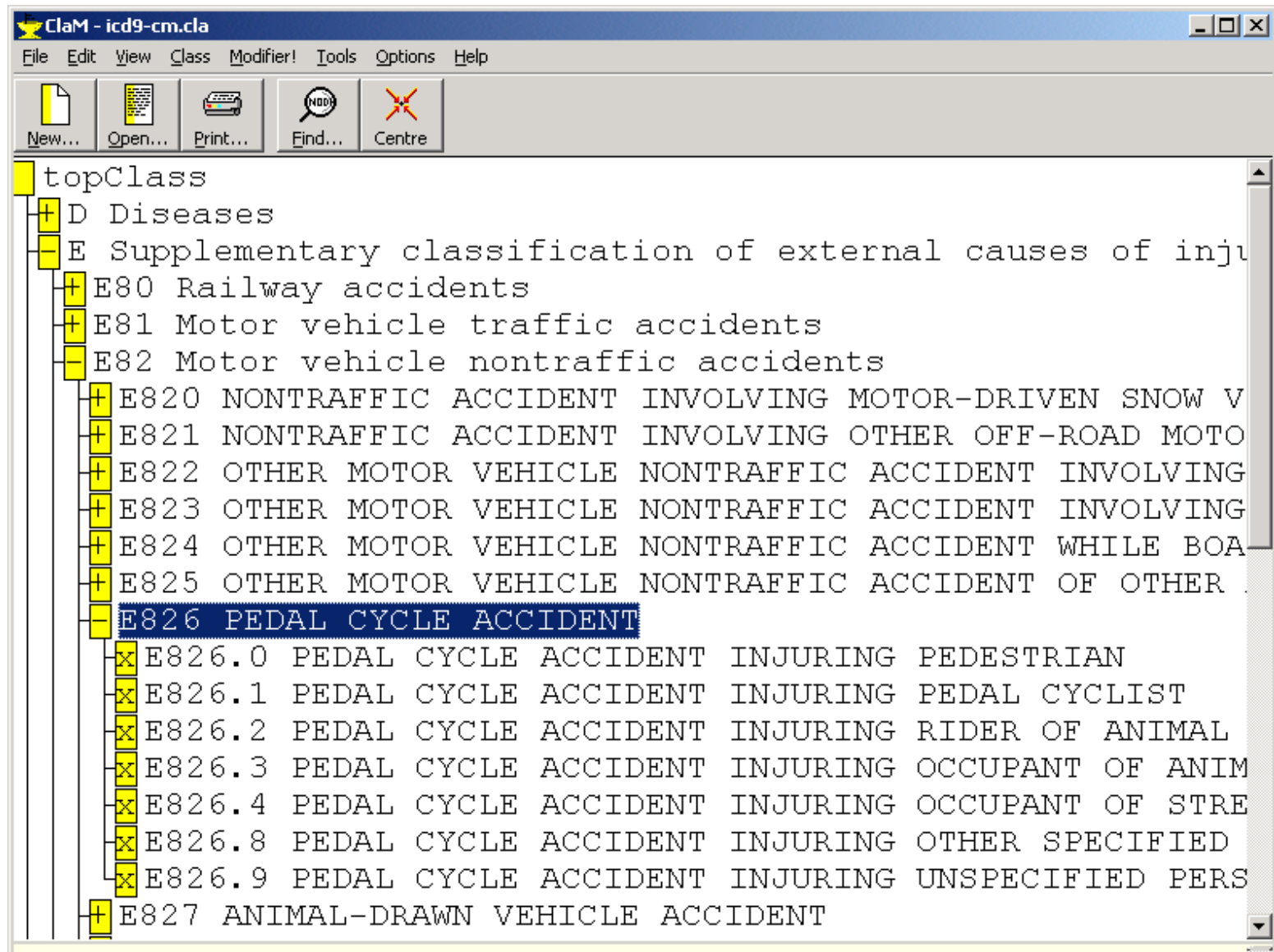
20th Century Analytics : The current way

Pre-hoc static, hierarchy of categories

21st Century Analytics : A new way?

20th Century Analytics

A classified code for each thing you want to count



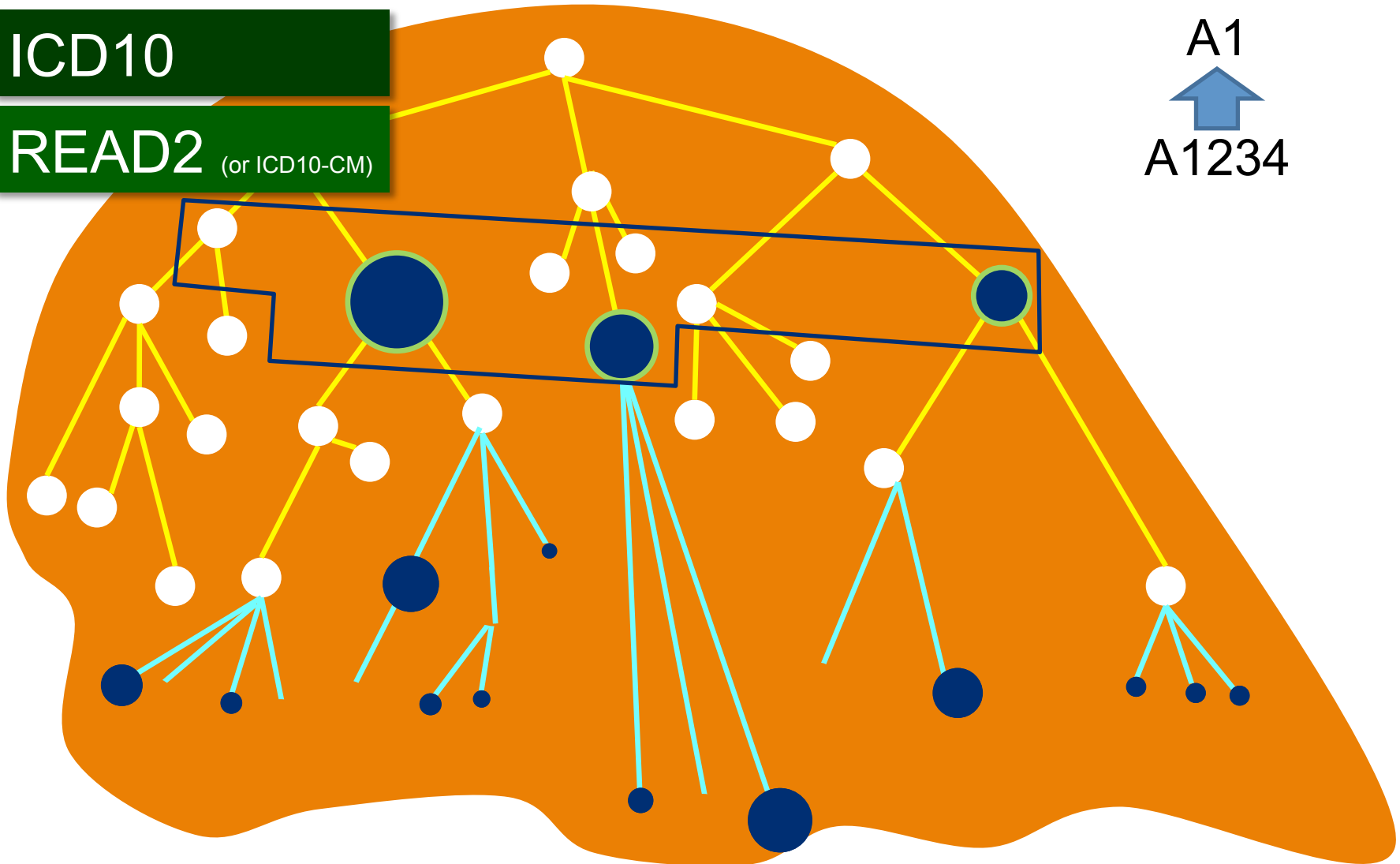
20th Century Analytics

Aggregate over shallow, fixed monohierarchies

ICD10

READ2 (or ICD10-CM)

A1
↑
A1234



Choices for aggregation...

ICD 10

ICD10 L2 Fixed
(224 categories)

83% of 417,211 episodes map to one of:

3,374 ICD10 codes

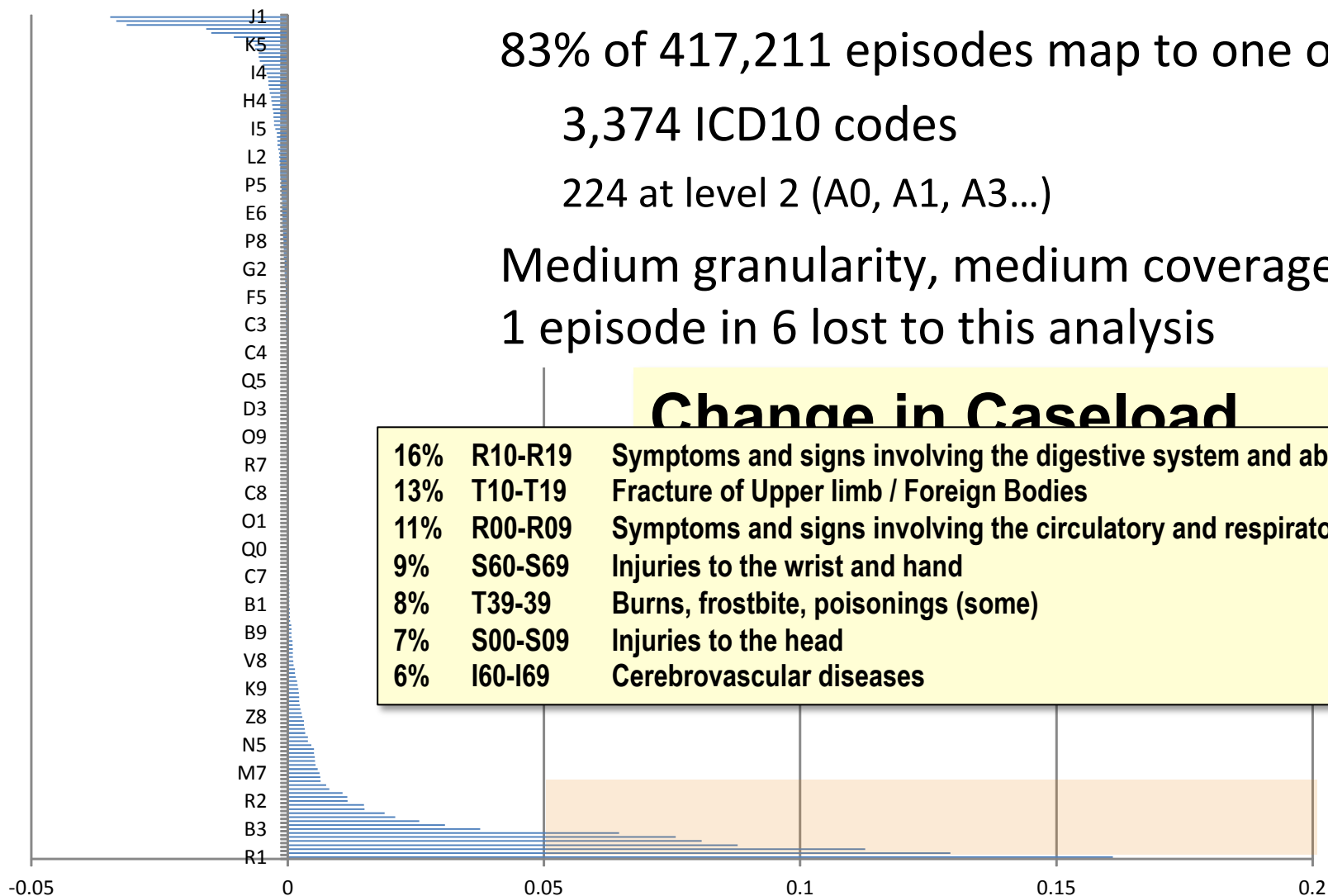
224 at level 2 (A0, A1, A3...)

Medium granularity, medium coverage

1 episode in 6 lost to this analysis

Change in Caseload

16%	R10-R19	Symptoms and signs involving the digestive system and abdomen
13%	T10-T19	Fracture of Upper limb / Foreign Bodies
11%	R00-R09	Symptoms and signs involving the circulatory and respiratory systems
9%	S60-S69	Injuries to the wrist and hand
8%	T39-39	Burns, frostbite, poisonings (some)
7%	S00-S09	Injuries to the head
6%	I60-I69	Cerebrovascular diseases



Outline

17th Century Analytics : The old way

Pre-hoc static categories

20th Century Analytics : The current way

Pre-hoc static, hierarchy of categories

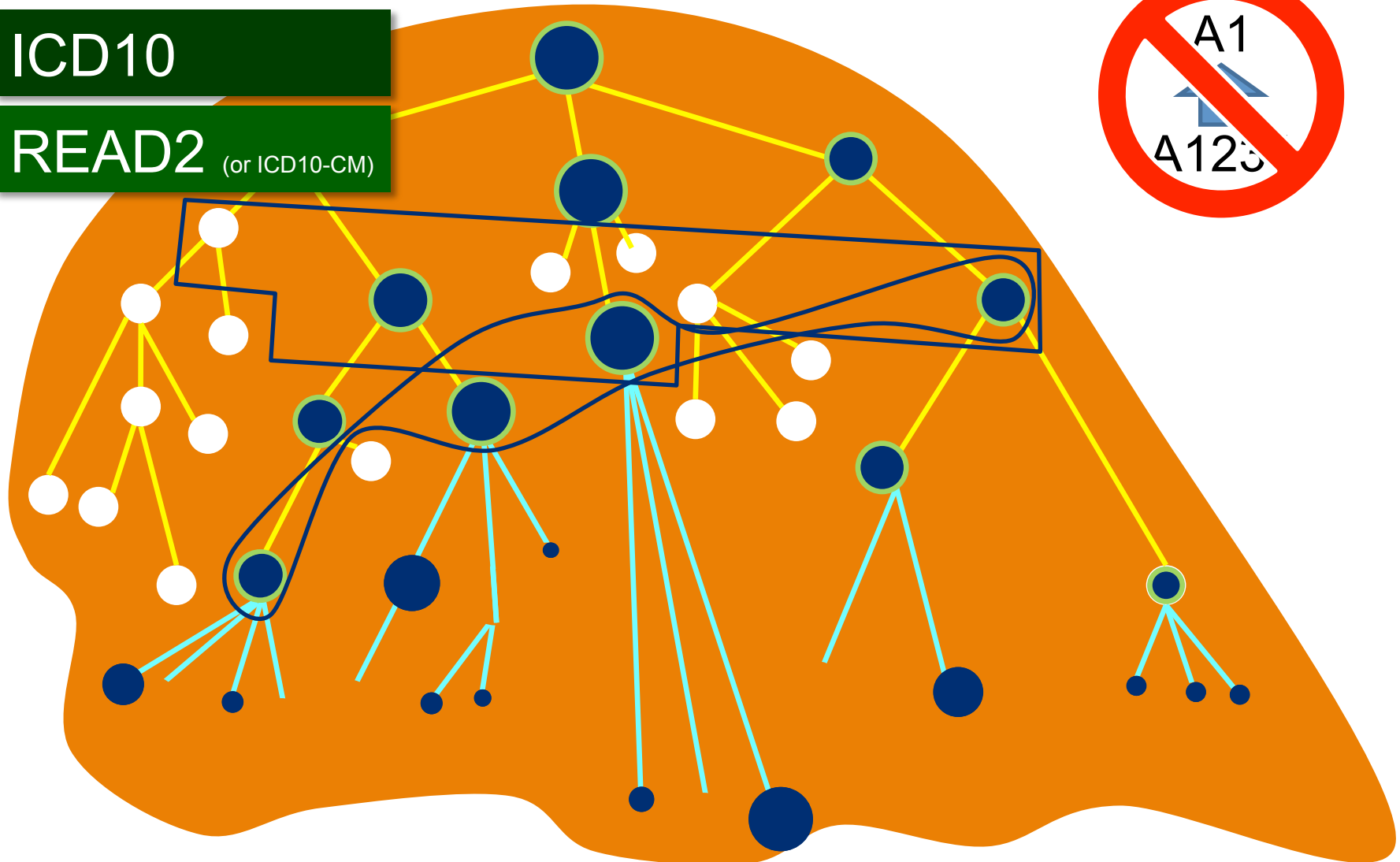
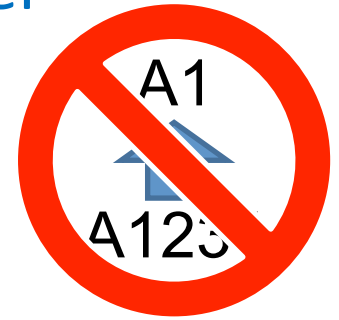
21st Century Analytics : A new way?

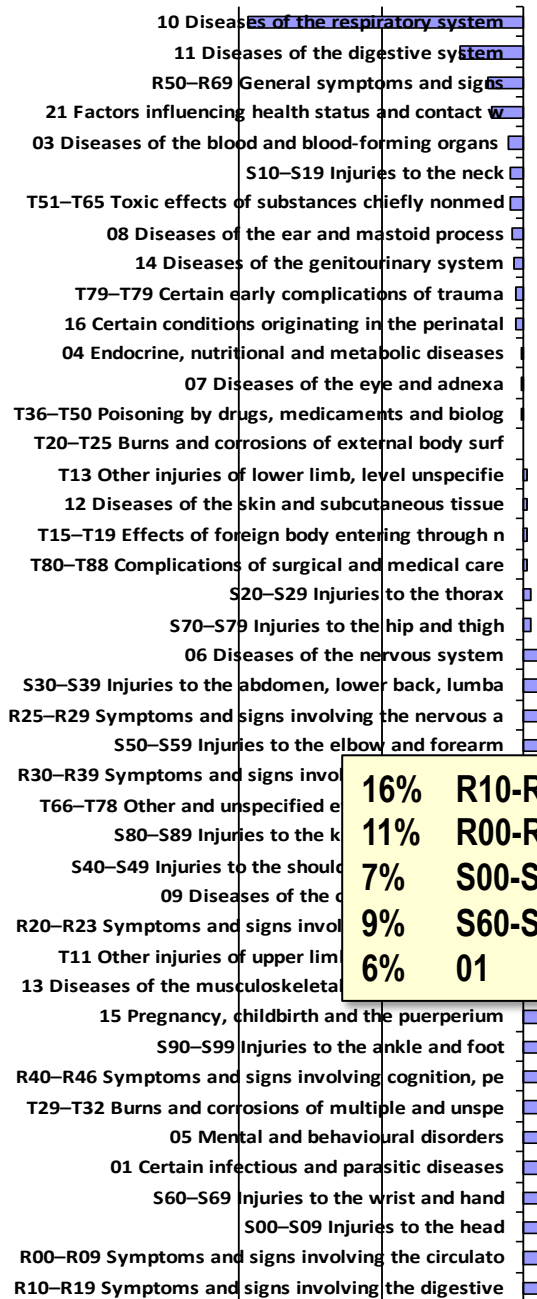
21st Century Analytics?

Dynamic selection of classes to aggregate over

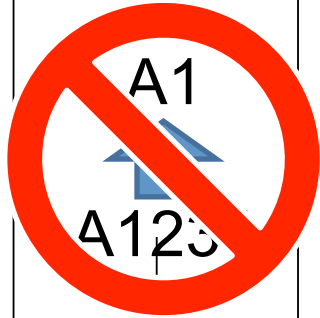
ICD10

READ2 (or ICD10-CM)





ICD10 Induced
(43 categories)



Change in Caseload

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7%	S00-S09	Injuries to the head
9%	S60-S69	Injuries to the wrist and hand
6%	01	Certain infectious and parasitic diseases

-10 -5 0 5 10 15 20 25 30 35 40

21st Century Analytics?

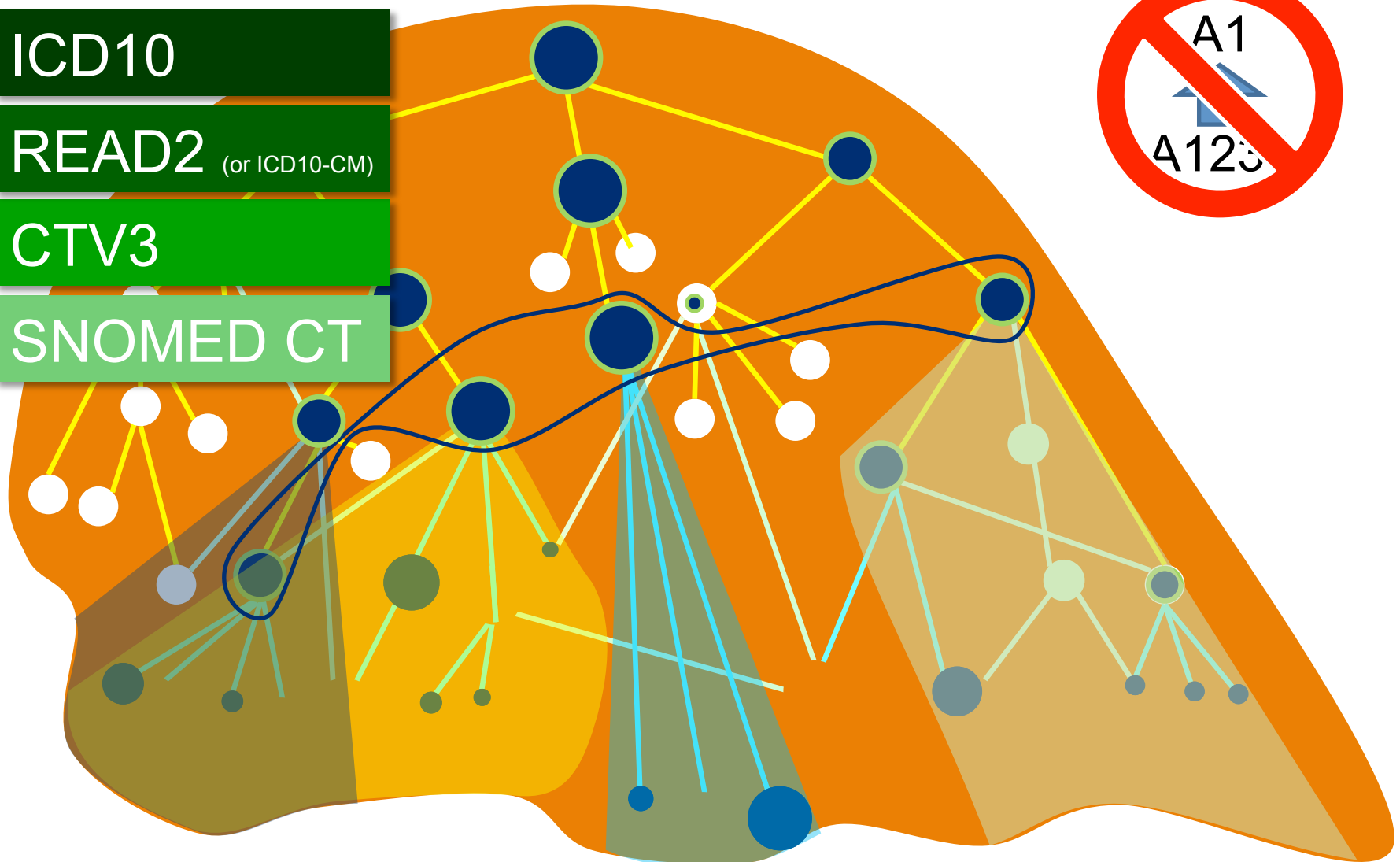
Dynamic induction of classes to aggregate over

ICD10

READ2 (or ICD10-CM)

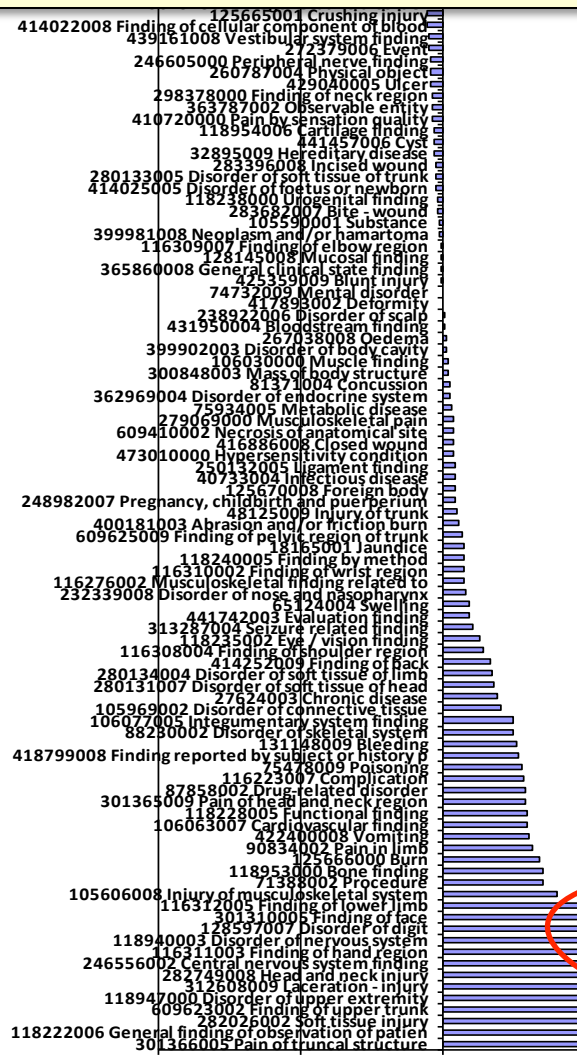
CTV3

SNOMED CT

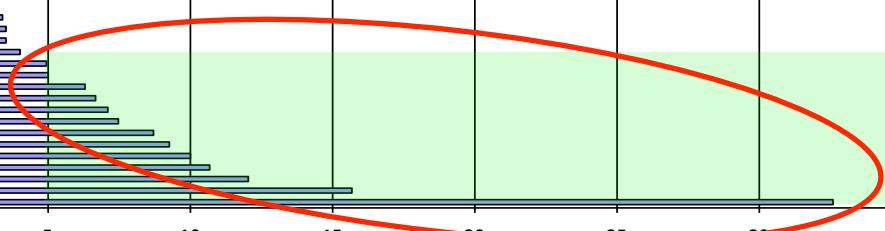


- R10-R19 Symptoms and signs involving the digestive system and abdomen
- R00-R09 Symptoms and signs involving the circulatory and respiratory systems
- S00-S09 Injuries to the head
- S60-S69 Injuries to the wrist and hand
- 01 Certain infectious and parasitic diseases

SNOMED CT Induced
(113 categories)



- 301366005 Pain of truncal structure
- 118222006 General finding of observation of patient
- 282026002 Soft tissue injury
- 609623002 Finding of upper trunk
- 118947000 Disorder of upper extremity
- 312608009 Laceration - injury
- 282749008 Head and neck injury
- 246556002 Central nervous system finding
- 116311003 Finding of hand region
- 118940003 Disorder of nervous system
- 128597007 Disorder of digit
- 301310005 Finding of face
- 116312005 Finding of lower limb



The 'invisible idiot' problem

<< 312608009 Laceration

13323 episodes (3.2%)
141 SNOMED codes

60 ICD-10 codes

24959 episodes
542 SNOMED codes

921 CODES across 28858 EPISODES (6.9% of all Episodes)

2629 episodes of 416462003 Wound (disorder)**
1323 episodes of 125670008 Foreign body (disorder)**
831 episodes of 85848002 Corneal abrasion (disorder)**
786 episodes of 125653000 Open wound of finger (disorder)**
670 episodes of 42818005 Closed fracture of navicular bone of wrist (disorder)**
621 episodes of 263196008 Fracture of radial head (disorder)**
490 episodes of 17222009 Closed fracture of distal end of radius (disorder)**
467 episodes of 283396008 Incised wound (disorder)**
459 episodes of 81576005 Closed fracture of phalanx of foot (disorder)**
426 episodes of 16114001 Fracture of ankle (disorder)**
379 episodes of 9468002 Closed fracture carpal bone (disorder)**
372 episodes of 425322008 Stab wound (disorder)**
369 episodes of 283419003 Cut of finger (disorder)**
367 episodes of 31975004 Fracture of navicular bone of wrist (disorder)**
360 episodes of 276433004 Insect bite - wound (disorder)**
328 episodes of 283596007 Needle stick injury (disorder)**
326 episodes of 125652005 Open wound of hand (disorder)**
321 episodes of 263171005 Fractured nasal bones (disorder)**
306 episodes of 208401007 Closed fracture finger metacarpal (disorder)**
298 episodes of 76865005 Closed fracture of distal phalanx of finger (disorder)**
294 episodes of 207753003 Fracture of mandible closed (disorder)**
270 episodes of 81102000 Injury of back (disorder)**
267 episodes of 20511007 Fracture of hand (disorder)**
251 episodes of 10380004 Crushing injury of finger (disorder)**
251 episodes of 111640008 Closed fracture of radius (disorder)**
251 episodes of 342070009 Closed fracture of foot (disorder)**
240 episodes of 18171007 Fracture of phalanx of finger (disorder)**
231 episodes of 125654006 Open wound of thumb (disorder)**
213 episodes of 302222008 Elbow fracture - closed (disorder)**
213 episodes of 309464009 Elbow fracture (disorder)**

<< 312608009 Laceration
<< 125643001 Open wound
= 416462003 Wound

21241 episodes (5.1%)
480 SNOMED codes

133 ICD-10 codes

42180 episodes
1061 SNOMED codes

Conclusion

Non-statistical analytics *can* be done natively in SNOMED CT

Clinical analytics *should* be done natively in SNOMED CT ?