Moving from ICD-9-CM Legacy to SNOMED CT Based Clinical Content

…an implementation in progress…

Nova Scotia – Physicians Manual Modernization Project

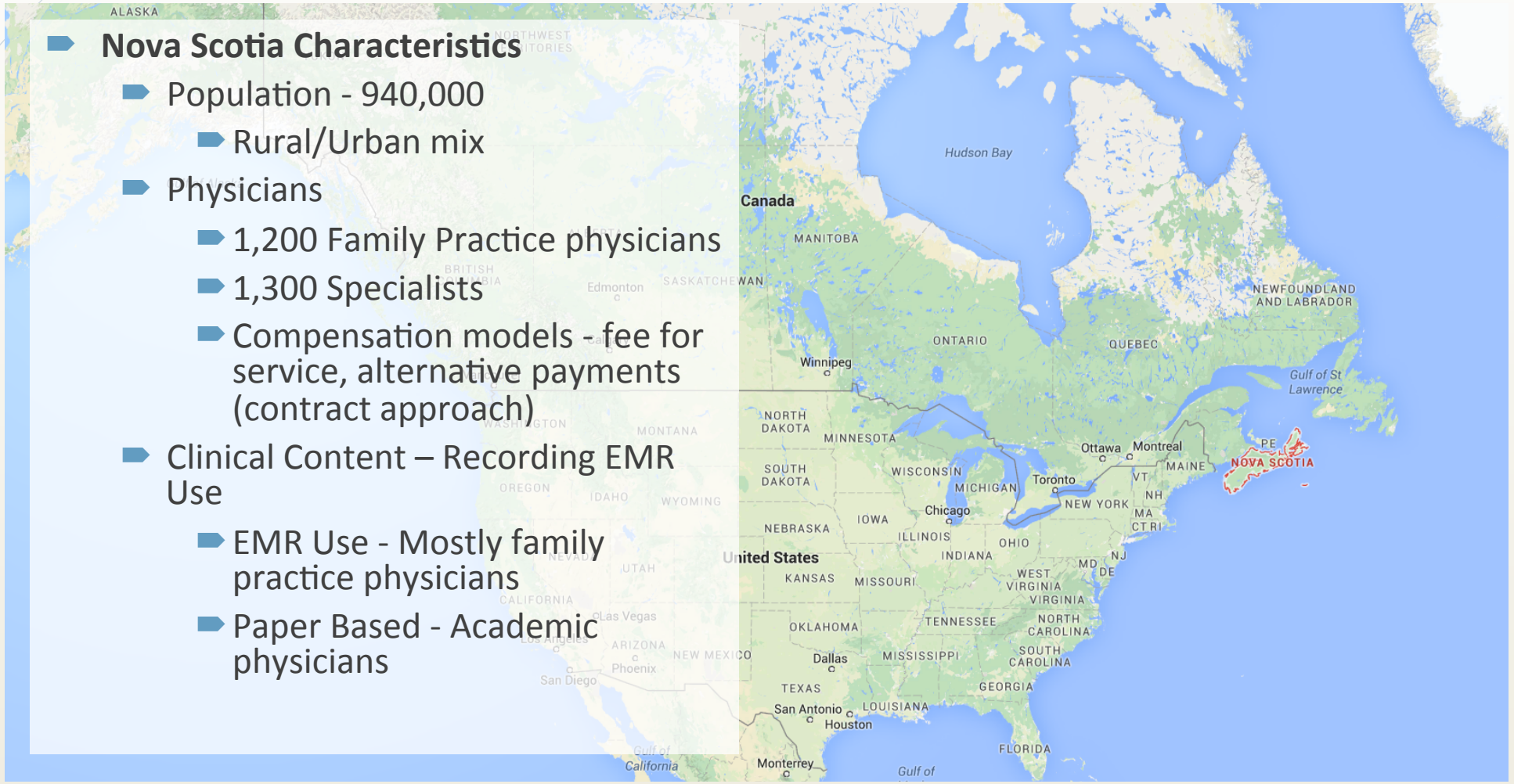
Robyn Kuropatwa, Kathy Giannangelo, Dennis Lee

Objectives

- Explain how the feasibility of proceeding with SNOMED CT implementation was assessed
- Share the approach used to clean and map legacy diagnoses and then build specialty specific subsets
- Describe the methods, tooling and documentation used to support review and audit
- Talk about lessons learned and the way forward

Nova Scotia & Medical Service Insurance Program

- **Nova Scotia Characteristics**
  - Population - 940,000
    - Rural/Urban mix
  - Physicians
    - 1,200 Family Practice physicians
    - 1,300 Specialists
    - Compensation models - fee for service, alternative payments (contract approach)
  - Clinical Content – Recording EMR Use
    - EMR Use - Mostly family practice physicians
    - Paper Based - Academic physicians



Nova Scotia & Medical Service Insurance Program

- **Medical Services Insurance Program**
  - Publicly funded program for physicians services for all people in Nova Scotia
  - Physicians required to collect/submit diagnoses, health service and other information elements
- Mature program involving
  - Policy, People, Operations/Support, Data Use
- Department of Health responsible for program policy (include IM policy), funding, monitoring and accountability
- Physicians – Service delivery & reporting
- Data/claims processing – 3rd party vendor
- EMR – 3rd party vendors

Nova Scotia Medical Services Insurance Program – Current State

October 2012

PHYSICIANS (MSI) CLINICAL SERVICE DELIVERY

POLICY & PEOPLE

POLICY

I Legislation
* Canada Health Act
* *Health Services Insurance Act*
* Interprovincial Agreements
* FOIPP

II Policy & Policy Instruments
* *Physicians Manual*
  - *Schedule of Insured Services*
* Compensation Model Policy
* Physician Master Agreement
* Academic Funding Plans
* Alternative Payment Plans
* Sessional Contracts
* *Physicians Manual*
  - *Preamble, Explanatory Notes*
  - *Rules, Modifiers*
* DHW Medavie Contract

FAIR · SAFE · TIMELY · ACCESS · QUALITY · INFORMED · AFFORDABLE · ACCOUNTABLE

Goal

To provide medically necessary and appropriate clinical services to the people of Nova Scotia

People

People of Nova Scotia, Taxpayers, Patients of the Health System, Clinical Service Providers, Policy Makers

PATIENTS & SERVICES

PATIENT CLINICAL (DIAGNOSIS) AND PHYSICIAN SERVICE DATA

PEOPLE AND ORGANIZATIONS

People of Nova Scotia
Taxpayers
Patients
Physicians/Service Providers
People doing Billing
Minister of Health
Department of Health
Doctors Nova Scotia
College of Physicians & Surgeons
Health Authorities
Medavie – Blue Cross
Billing/EMR Vendors
Other Provincial Ministries
Workers Compensation Board
Dalhousie Medical School
Canadian Institute for Health Information

OPERATIONS

PROCESSES – SERVICE DELIVERY, CLAIM SUBMISSION TO DATA ANALYSES AND USE

PHYSICIAN SERVICE DELIVERY				RECORD-SUBMIT		CLAIM ADJUDICATION AND PAYMENT					AUDIT	DATA ANALYSES & USE	
Patient Request Service	Dr Assess Patient	*Dr Diagnose Patient*	*Dr Provide Service*	Dr. Record Patient Info	Submit Service Claim	Assess Claim to Rules	Approve or Reject	Claim Resubmit	Manual Review	Claim Payment	Claim Audit	Internal Analyses	Support External Analyses

SUPPORT

PROCESS SUPPORTS – DOCUMENTATION, COMMUNICATION, EDUCATION AND TECHNOLOGY

COMMUNICATION/EDUCATION
Claim Submit/Billing Education
Physicians Bulletin
DNS Website E-News
DNS Physician Newsletter

DOCUMENTATION
Physicians Manual
Physicians Billing Instructions Manual
Vendor Claim Submit Specs
Documentation Maintenance

RECORD
Paper Forms, Practimax, Nightingale, etc.

SUBMIT CLAIM
Practimax, Nightingale, MOM, etc.

ADJUDICATION
MED database (claims, rules, patients, providers)

DATA STORE
Medavie/DHW DSS data warehouse

LINKAGES
WCB
Other Provinces
CIHI
Dalhousie

USE

PATIENT CLINICAL (DIAGNOSES) AND PHYSICIAN SERVICE DATA USES

PLANNING
- DHW-AFP, APP Planning
- DHW, DNS Budget Projection
- DHW, DNS Negotiations
- DHW, DNS Provincial Program planning
- DHW, DN, DHA Health Human Resource Planning

DESCRIPTIVE ANALYSIS
- DHW analyses to inform policy
- FSAC analyses to support compensation policy
- Medavie – Formal & Ad Hoc
- Medavie – Physician Profiles
- Physicians – Physician Profiles
- CIHI – Physician-Service Cross-Province Comparison

PAYMENT
- Physician-Billing
- Medavie – Payment Processing
- Physician – Payment Receipt
- DHW-Payment Reconciliation
- Workers Compensation
- Interprovincial Billing

MONITORING
- Health Services Insurance Act – to meet reporting requirements
- DHW - Budget Management
- DHW Master Agreement Management
- DNS Master Agreement Management
- AFP/APP/Session Contract Management
- Medavie – Contract Management

AUDIT
- DHW – Physician Audit
- Medavie – Physician Audit
- College of Physicians and Surgeons

GAPS/LIMITED USE – PHYSICIAN CLINICAL, DATA QUALITY

NS PMMP Goals for Future to 2030

1. Modernize the Schedule of Insured Services for the people of NS
2. Establish and implement framework to accurately define clinical diagnosis and service descriptions
3. Prepare and sustain relevant and accurate supporting documentation
4. Update related policy and operational processes
5. Align required data and information flows to meet accountabilities and support clinicians and organizations
6. Retain current and increase future data and information use

Six Phases Spanning 2012 - 2017

Planning Through Implementation

I. Project Scope and Map

II. **Clinical Diagnosis and Services Reporting – Content Definition, Development and Documentation**

   I. **Assessment of Feasibility**

   II. **SNOMED CT and CPT Adoption – Decision**

   III. **Clinical Term Cleaning, Mapping and Subsets**

III. **Clinical and Service Content Use, Policy and Process Modification and IT Assessment of Requirements (including uses)**

IV. Policy and Process Testing and IT modification

V. Implementation of policy, processes and IT

VI. Implementation Maintenance

Assessment of Feasibility & Diagnoses Cleaning, Mapping and Validation

Kathy Giannangelo

Assessment of Feasibility: Four Dimensions

- Technical
- Organizational
- Improved content
- Overall

SNOMED CT – Appraisal to Subsets

- SNOMED CT Adoption - Diagnoses
  - Diagnoses content broad appraisal
  - Cleaning and Mapping
  - Physician Validation
  - Specialty Specific Subset

Cleaning Diagnoses Descriptions

Diagnoses cleaned to support mapping to SNOMED CT

Approach:

- Identify diagnosis description
- Identify reputable source of ICD-9-CM description and code
  - Centers for Disease Control and Prevention, 2012 version
- Review each diagnosis description
- Create the cleaned diagnosis description

Cleaned Diagnoses Descriptions

NS Description	CDC Description	Cleaned Description
Other convulsions	Other convulsions	Other convulsions
Ben neo pit gl/craniophar duct	Benign neoplasm of pituitary gland and craniopharyngeal duct	Benign neoplasm of pituitary gland and craniopharyngeal duct
Unspecified thyroiditis	Thyroiditis, unspecified	Thyroiditis, unspecified
Sprains and strains of ribs	Sprain of ribs	Sprains and strains of ribs
Oth br lacn/contus w op wnd nos	Other and unspecified cerebral laceration and contusion, with open intracranial wound, unspecified state of consciousness	Other brain laceration and contusion, with open wound, unspecified
Other sympt nerv/musculoskel system		Other symptoms of nervous and musculoskeletal system

Why is Mapping Needed?

To provide a link between one terminology (ICD-9-CM) to another terminology (SNOMED CT) in order to retain the value of historical data

- Support auditing and analyses across years
- Enable continuation of current analyses

Combined Specialties and Subspecialties

- Surgery – 669
  - Cardiovascular/Thoracic Surgery – 112
  - Thoracic Surgery – 289
  - Vascular Surgery – 396
- Pathology – 890
  - Anatomical Pathology – 749
  - Haematological Pathology – 61
  - Neuropathology – 70
  - General Pathology – 260
- Genetics – 489
  - Human Genetics – 19
  - Medical Genetics – 483
- Neurology – 1483
  - Neurology – 1,400
  - Neurology Paediatric – 307
- Diagnostic Imaging - 1703
  - Diagnostic Radiology – 1704
  - Nuclear Medicine – 30
  - Diagnostic & Therapeutic Radiology – 30

Mapping Examples

- Single Pre-coordinated Concepts (9,540)
  - 230.2 - Carcinoma in situ of stomach
    - 92756002|Carcinoma in situ of stomach (disorder)|
- Multiple Pre-coordinated Concepts (678)
  - 379.92 - Swelling or mass of eye
    - 300849006|Mass of eye structure (finding)|
    - 45177002|Swelling of structure of eye (finding)|
- Post-coordination (ongoing)
  - 170.5 - Malignant neoplasm of short bones of upper limb
    - 126571009|Neoplasm of short bone of upper limb (disorder)|:
      116676008|Associated morphology (attribute)|=
      367651003|Malignant neoplasm of primary, secondary, or uncertain origin (morphologic abnormality)|
- Not Mapped (30)
  - V68.2 - Request for expert evidence

SNOMED CT to ICD-9-CM Equivalency Map, July 31, 2013

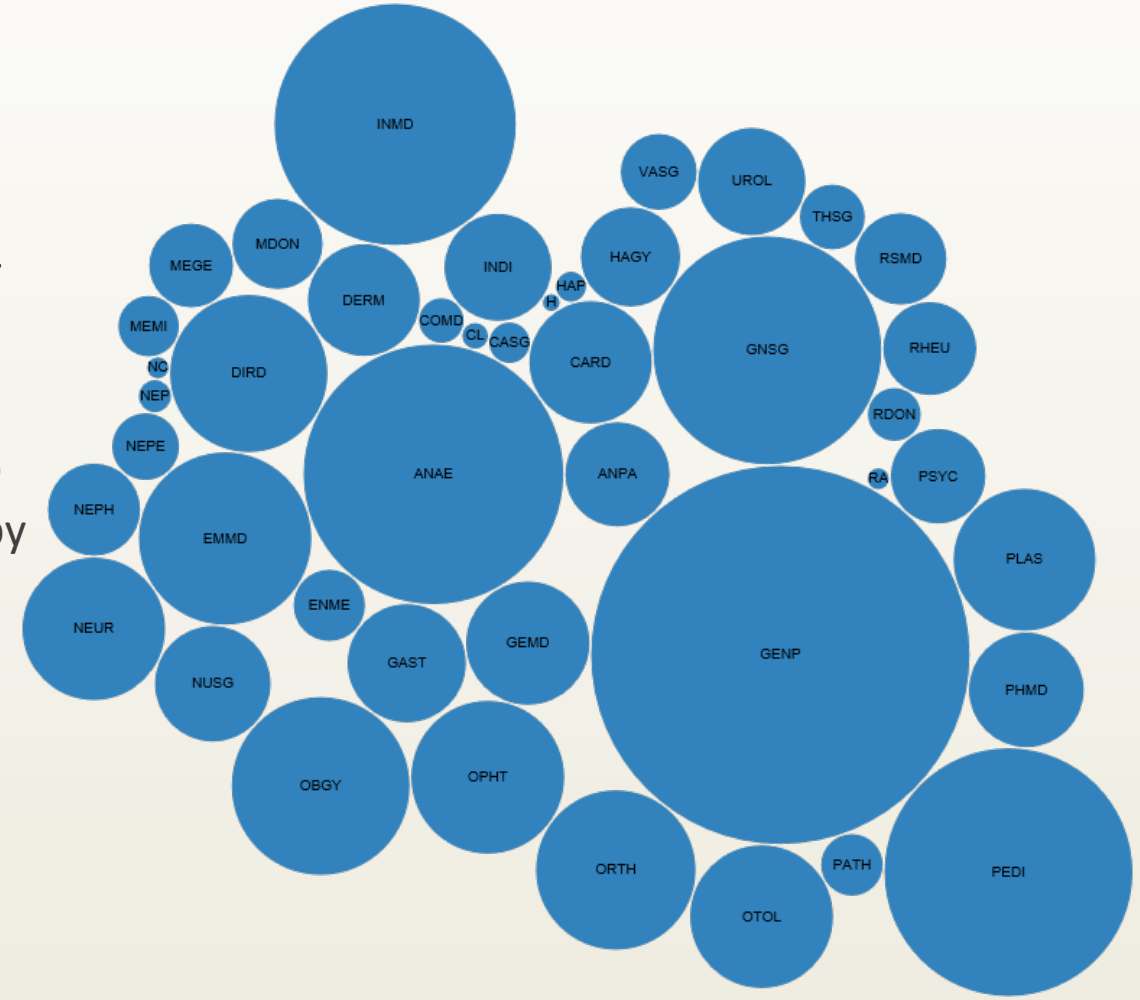
- Number of records: 116,419
  - Unique number of ICD-9-CM codes: 11,610
  - Unique number of SNOMED CT concepts with map: 85,002
  - Unique number of SNOMED CT concepts without map: 18,376
- SNOMED CT source code to target map code correlation value
  - **Exact match** map from SNOMED CT source code to target code
  - **Broad to narrow** map from SNOMED CT source code to target code
  - **Narrow to broad** map from SNOMED CT source code to target code
  - **Partial overlap** between SNOMED CT source code and target code
  - SNOMED CT source code **not mappable** to target coding scheme
  - SNOMED CT source code to target map code correlation **not specified**

SNOMED CT to ICD-9-CM Equivalency Map, July 31, 2013

- What we used: 7,885 maps
  - Unique SNOMED CT concepts: 7,882
  - Unique ICD-9-CM codes: 7,590
  - Correlation
    - Exact match: 6487
    - Narrow to broad: 1376
    - Broad to narrow: 19
    - Partial overlap: 3
- What we did not use: 73,518 maps
  - Unique SNOMED CT concepts: 64,046
  - Unique ICD-9-CM codes: 6,935
  - Correlation
    - Exact match: 10183
    - Narrow to broad: 62314
    - Broad to narrow: 788
    - Partial overlap: 233

Mapping and Validation Process

- Mapping
  - Extract historical clinical diagnoses (ICD-9-CM), ~10,341
  - Map clinical diagnoses to SNOMED CT
    - Apply map between SNOMED CT and ICD-9-CM developed by the IHTSDO
    - Apply lexical matching (compare cleaned diagnoses descriptions to SNOMED CT descriptions)
    - Manual review and mapping



Mapping and Validation Process (Cont'd)

- Cycle 1: Physician Beacons Validation of Mapping
  - Validation sets of 500 clinical diagnoses
    - Per specialty
  - Beacons validate mappings
    - Clinical meaning index (CMI)
      - Clinical meaning is the same
      - Clinical meaning is somewhat the same
      - Clinical meaning is different
      - Unsure
  - Analyse results and respond
    - Beacons CMI lower than RKL CMI
    - Beacons have comments
  - Update map

Related Content - Rules

- Validation, adjudication and audit rules
- Analysis of business rule components
- Linking rules to policies, diagnoses and health services
- From new content to existing -> implications on rules

Reviewing Beacons Feedback

Response to Beacons Feedback	Total
Change required	93
Change not required - clinician does not use code	21
Change not required - clinician is unsure of code	35
Change not required - synonym exists	121
Change not required - definition is implicit	22
Change not required - suggested term is more/less specific	4
Change not required - clinician is making general comment or comment about ICD that does not affect the code	214
Change not required - term showed clinician is the same or almost exactly the same as source term	60
Change not required - other or unspecified	16
Change not required - mapping rule applies	18
Change not required - best SNOMED CT concept available assigned	112

Building Specialty Specific Subsets Methods, Tooling and Documentation

Dennis Lee

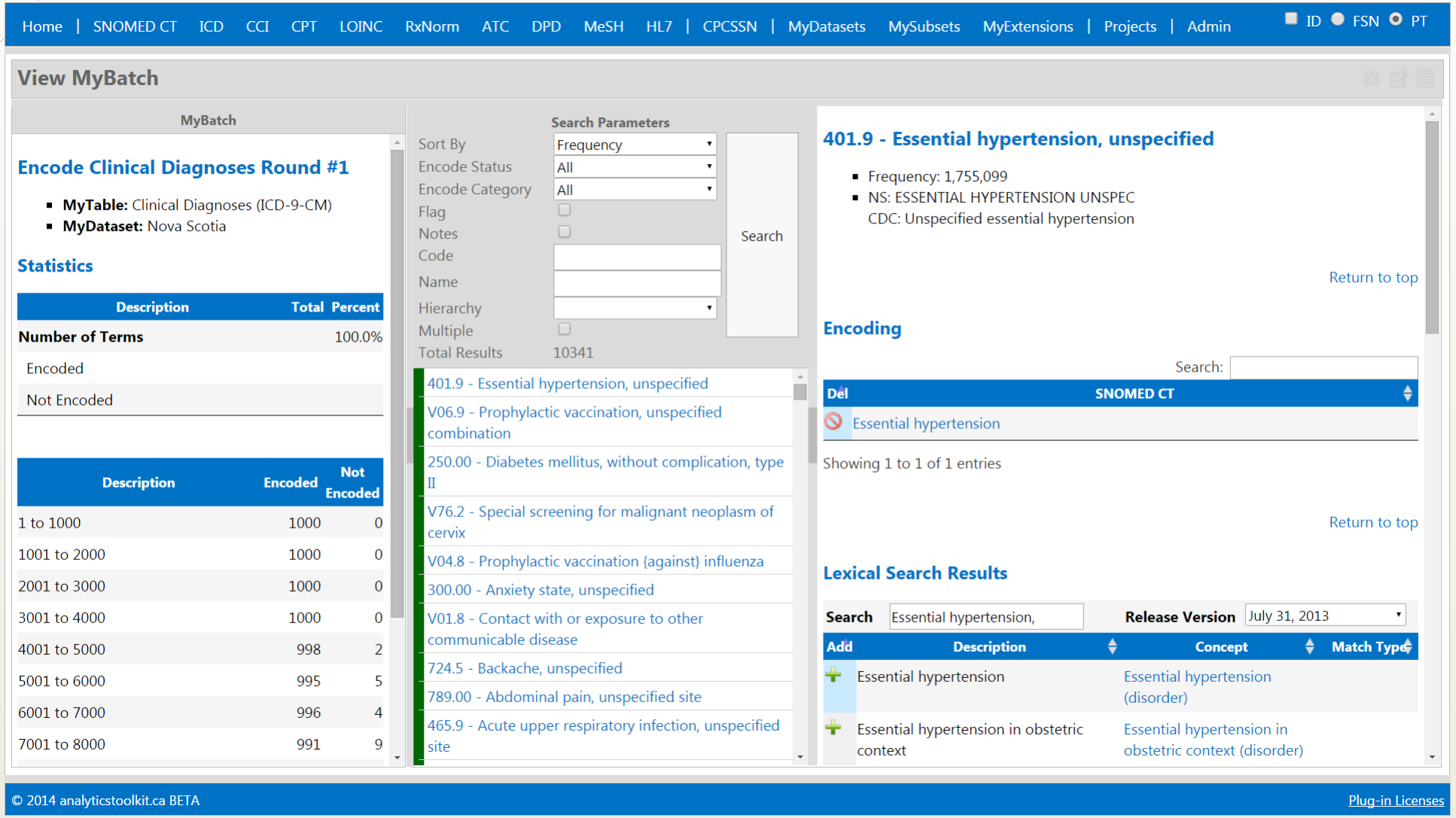
Building Subsets

- Three Cycles
  - 1) Map Validation 2) Remove Redundant 3) Add Relevant
- Start with local terms – Map Validation Results
- Use other credible subsets as resources
- Adapt for Nova Scotia use
- Support with tools
- Physician involvement throughout

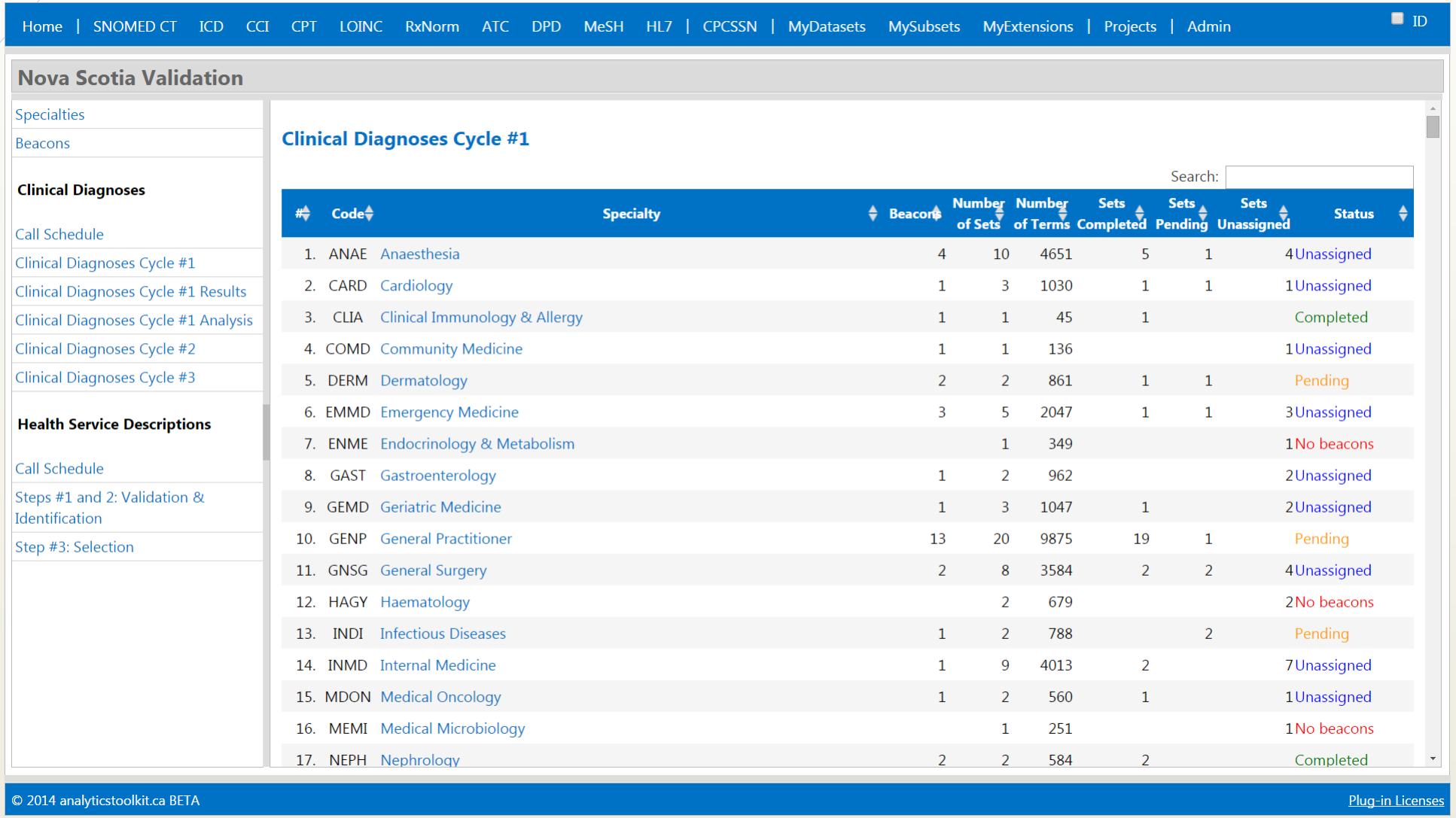
analyticstoolkit.ca

- Terminology server
  - Search/Browse
    - SNOMED CT
    - ICD-9-CM
    - CPT
    - …
  - Standardized tools
    - MyDatasets
    - MySubsets
  - Customised tools
    - Nova Scotia Validation
    - Nova Scotia Call Schedule

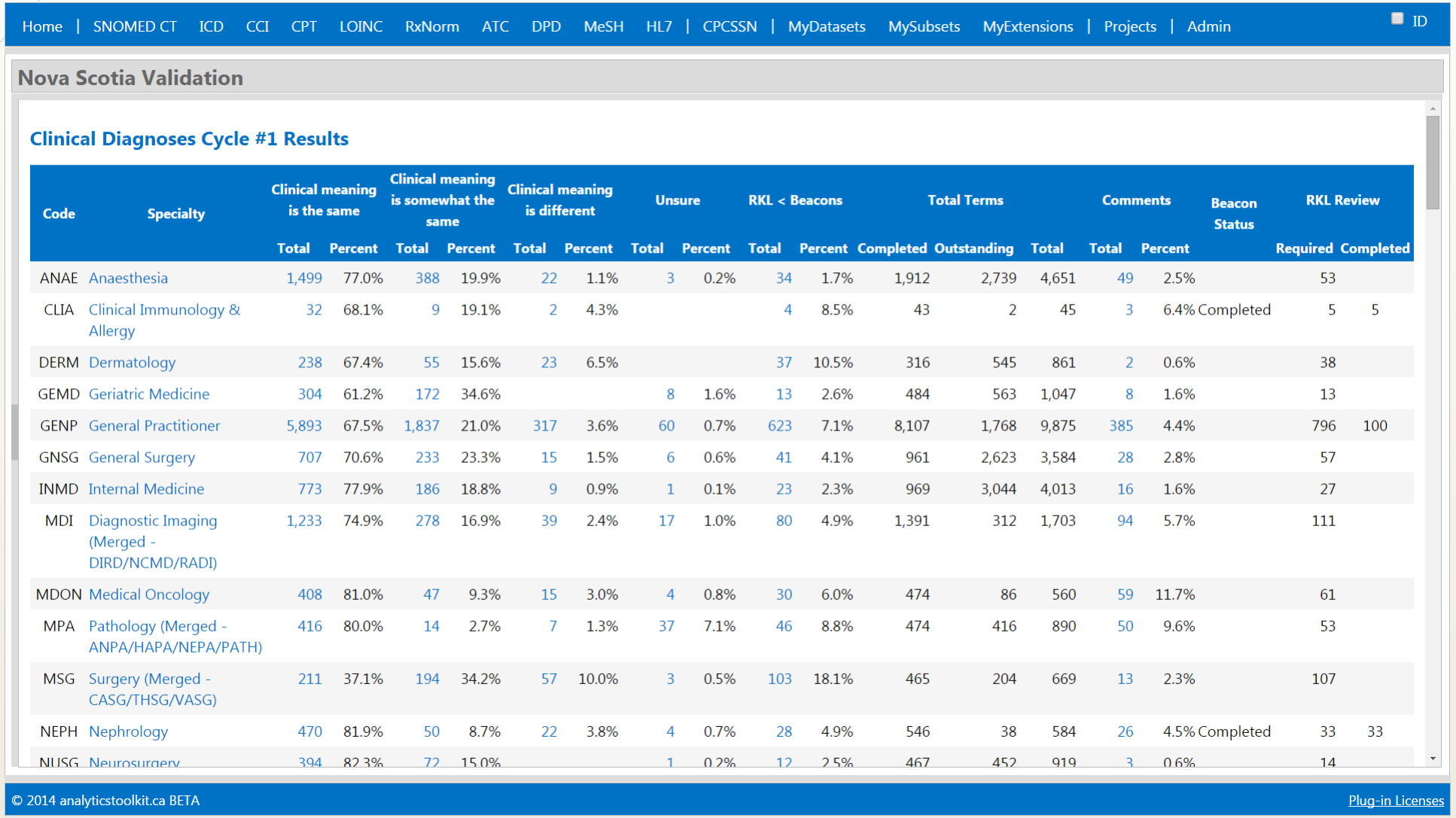
Cycle 1 - Mapping Datasets



Cycle 1 - Tracking Validation Progress



Cycle 1 - Tracking Validation Progress (cont)



Home | SNOMED CT ICD CCI CPT LOINC RxNorm ATC DPD MeSH HL7 | CPCSSN | MyDatasets MySubsets MyExtensions | Projects | Admin ID

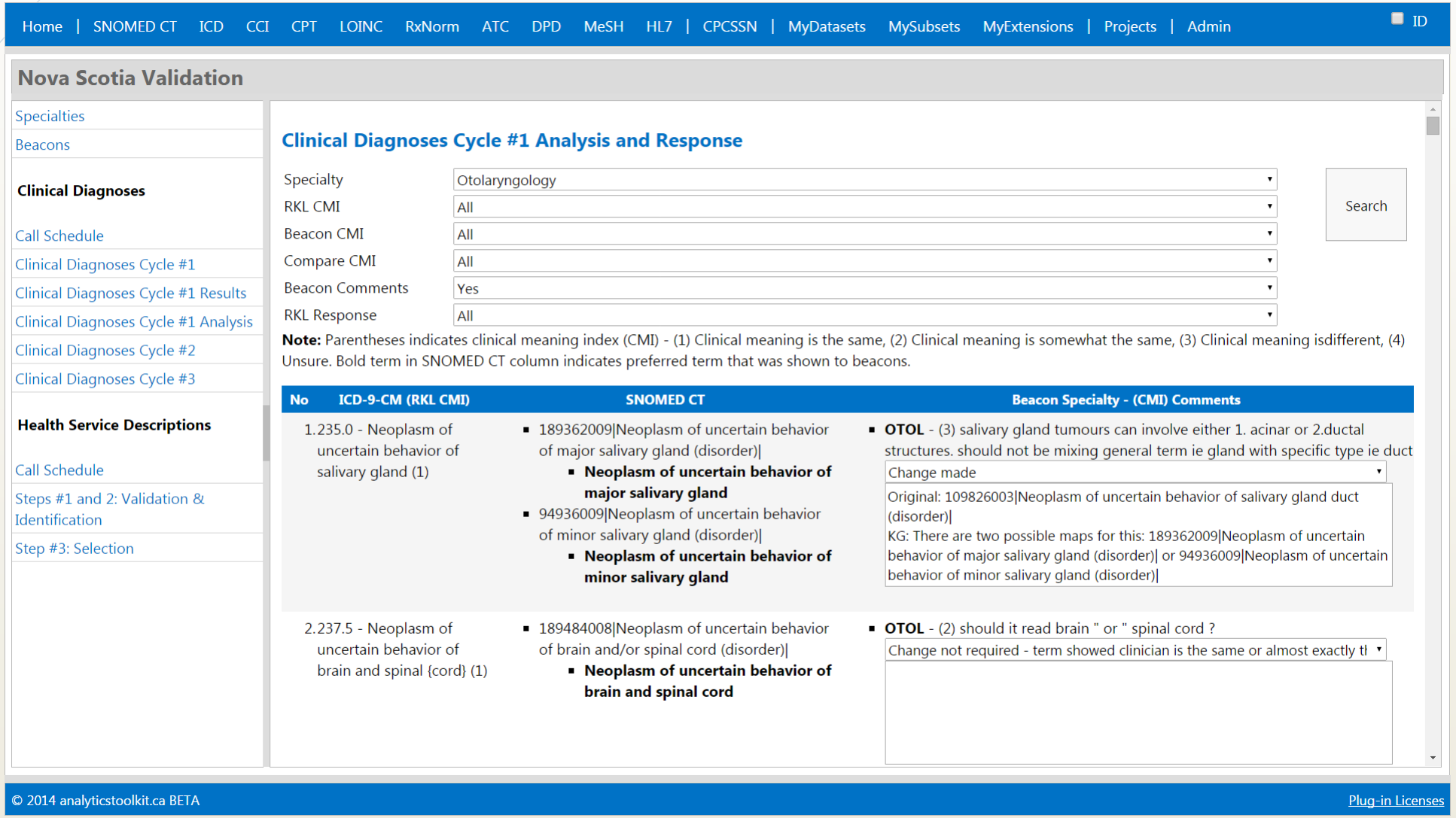
Nova Scotia Validation

Clinical Diagnoses Cycle #1 Results

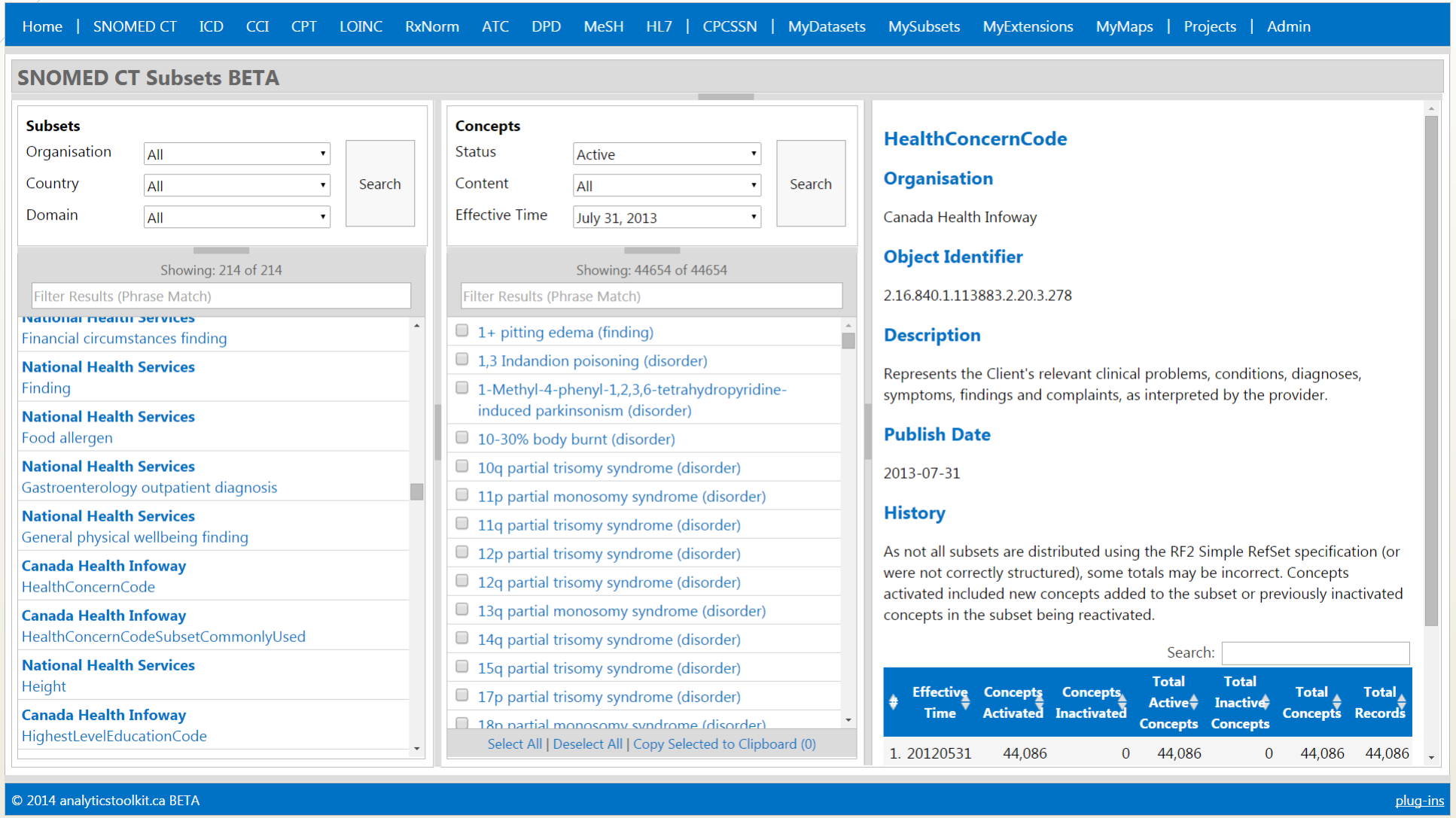
Code	Specialty	Clinical meaning is the same		Clinical meaning is somewhat the same		Clinical meaning is different		Unsure		RKL < Beacons		Total Terms			Comments		Beacon Status	RKL Review	
		Total	Percent	Total	Percent	Total	Percent	Total	Percent	Total	Percent	Completed	Outstanding	Total	Total	Percent		Required	Completed
ANAE	Anaesthesia	1,499	77.0%	388	19.9%	22	1.1%	3	0.2%	34	1.7%	1,912	2,739	4,651	49	2.5%		53	
CLIA	Clinical Immunology & Allergy	32	68.1%	9	19.1%	2	4.3%			4	8.5%	43	2	45	3	6.4%	Completed	5	5
DERM	Dermatology	238	67.4%	55	15.6%	23	6.5%			37	10.5%	316	545	861	2	0.6%		38	
GEMD	Geriatric Medicine	304	61.2%	172	34.6%			8	1.6%	13	2.6%	484	563	1,047	8	1.6%		13	
GENP	General Practitioner	5,893	67.5%	1,837	21.0%	317	3.6%	60	0.7%	623	7.1%	8,107	1,768	9,875	385	4.4%		796	100
GNSG	General Surgery	707	70.6%	233	23.3%	15	1.5%	6	0.6%	41	4.1%	961	2,623	3,584	28	2.8%		57	
INMD	Internal Medicine	773	77.9%	186	18.8%	9	0.9%	1	0.1%	23	2.3%	969	3,044	4,013	16	1.6%		27	
MDI	Diagnostic Imaging (Merged - DIRD/NCMD/RADI)	1,233	74.9%	278	16.9%	39	2.4%	17	1.0%	80	4.9%	1,391	312	1,703	94	5.7%		111	
MDON	Medical Oncology	408	81.0%	47	9.3%	15	3.0%	4	0.8%	30	6.0%	474	86	560	59	11.7%		61	
MPA	Pathology (Merged - ANPA/HAPA/NEPA/PATH)	416	80.0%	14	2.7%	7	1.3%	37	7.1%	46	8.8%	474	416	890	50	9.6%		53	
MSG	Surgery (Merged - CASG/THSG/VASG)	211	37.1%	194	34.2%	57	10.0%	3	0.5%	103	18.1%	465	204	669	13	2.3%		107	
NEPH	Nephrology	470	81.9%	50	8.7%	22	3.8%	4	0.7%	28	4.9%	546	38	584	26	4.5%	Completed	33	33
NUSG	Neurosurgery	394	82.3%	72	15.0%			1	0.2%	12	2.5%	467	452	919	3	0.6%		14	

Plug-in Licenses

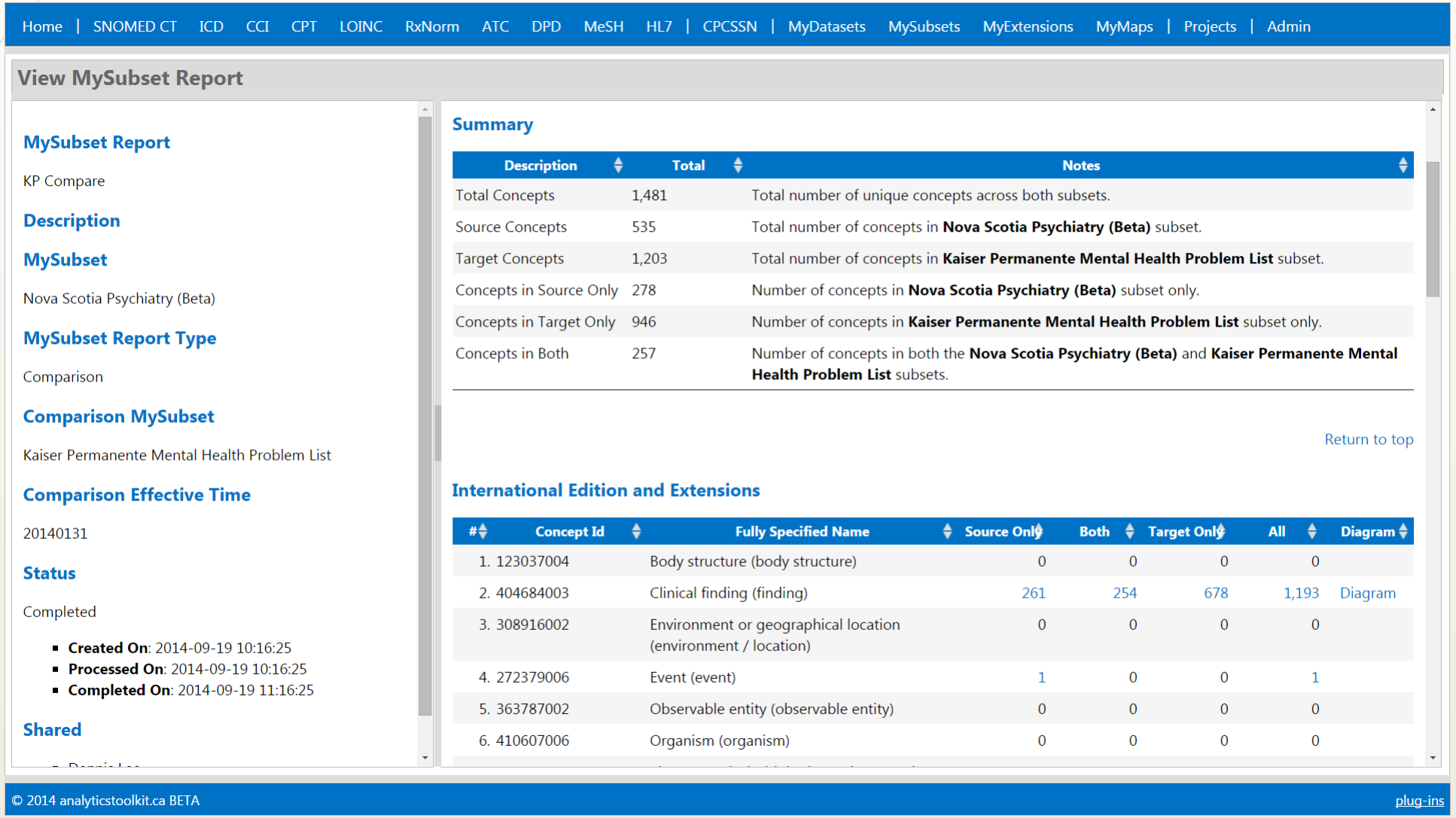
Cycle 1 - Tracking Validation Progress (cont)



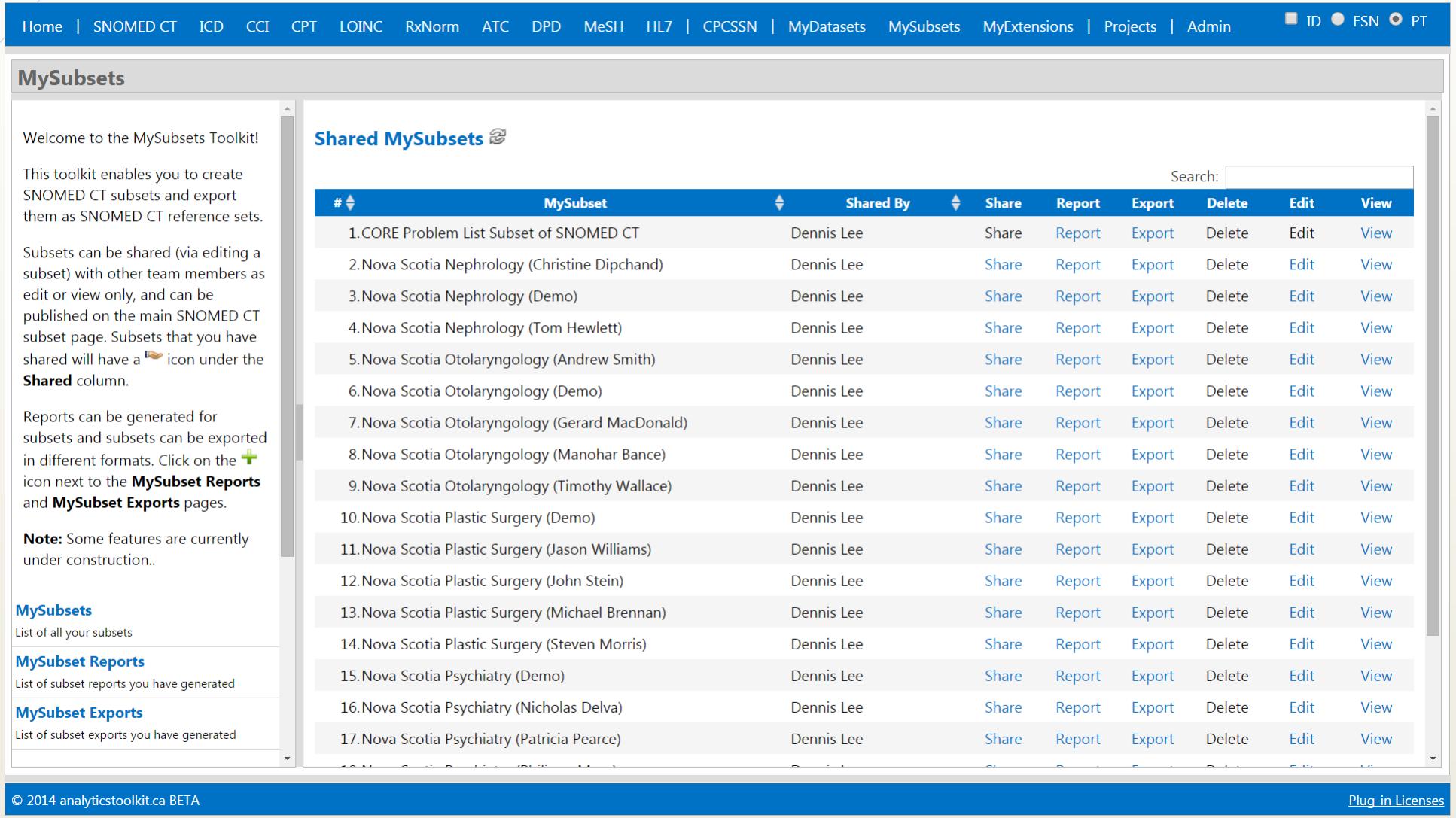
Cycle 2/3 - SNOMED CT Subset Browser



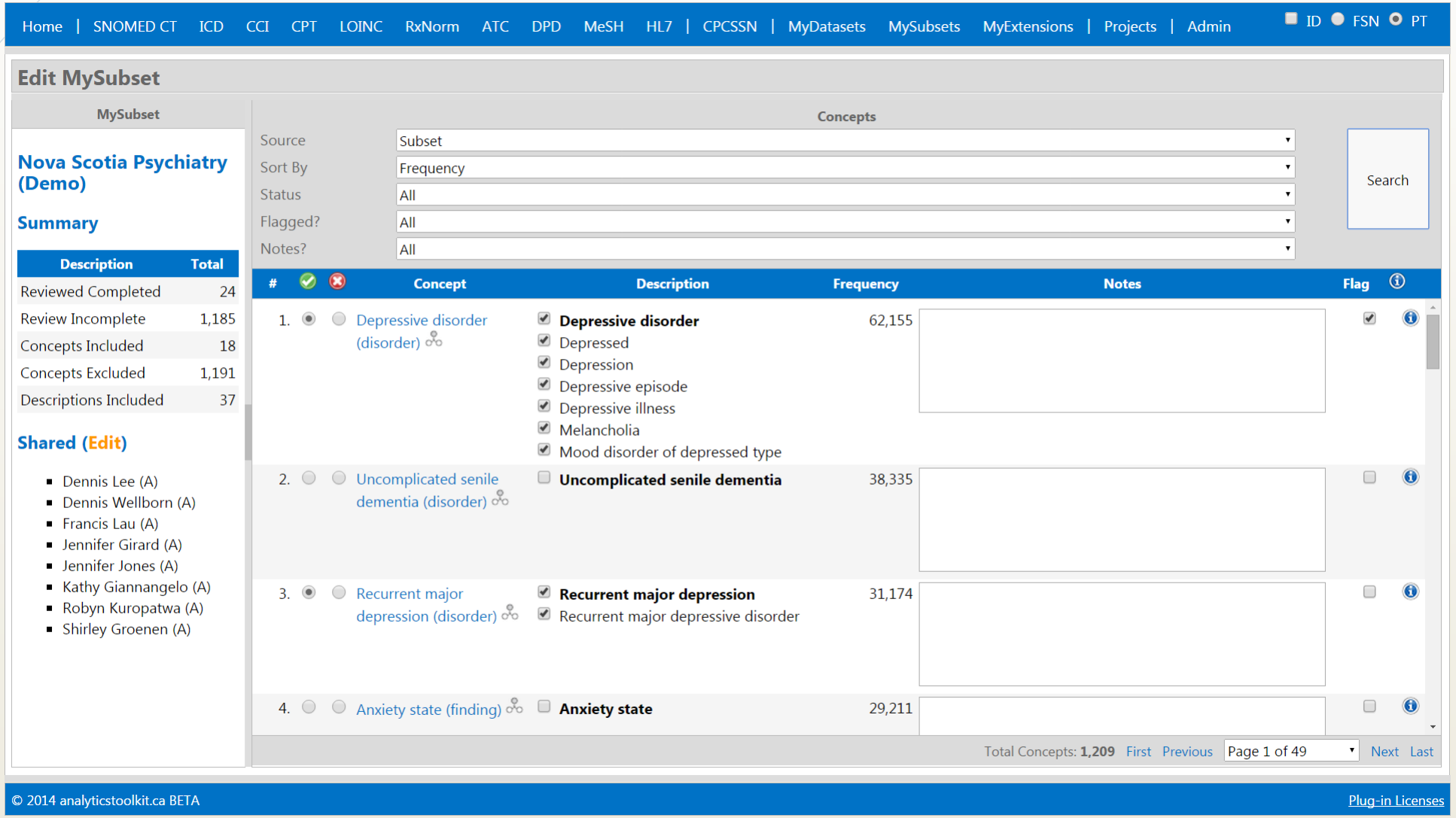
Cycle 2/3 Subset Reports



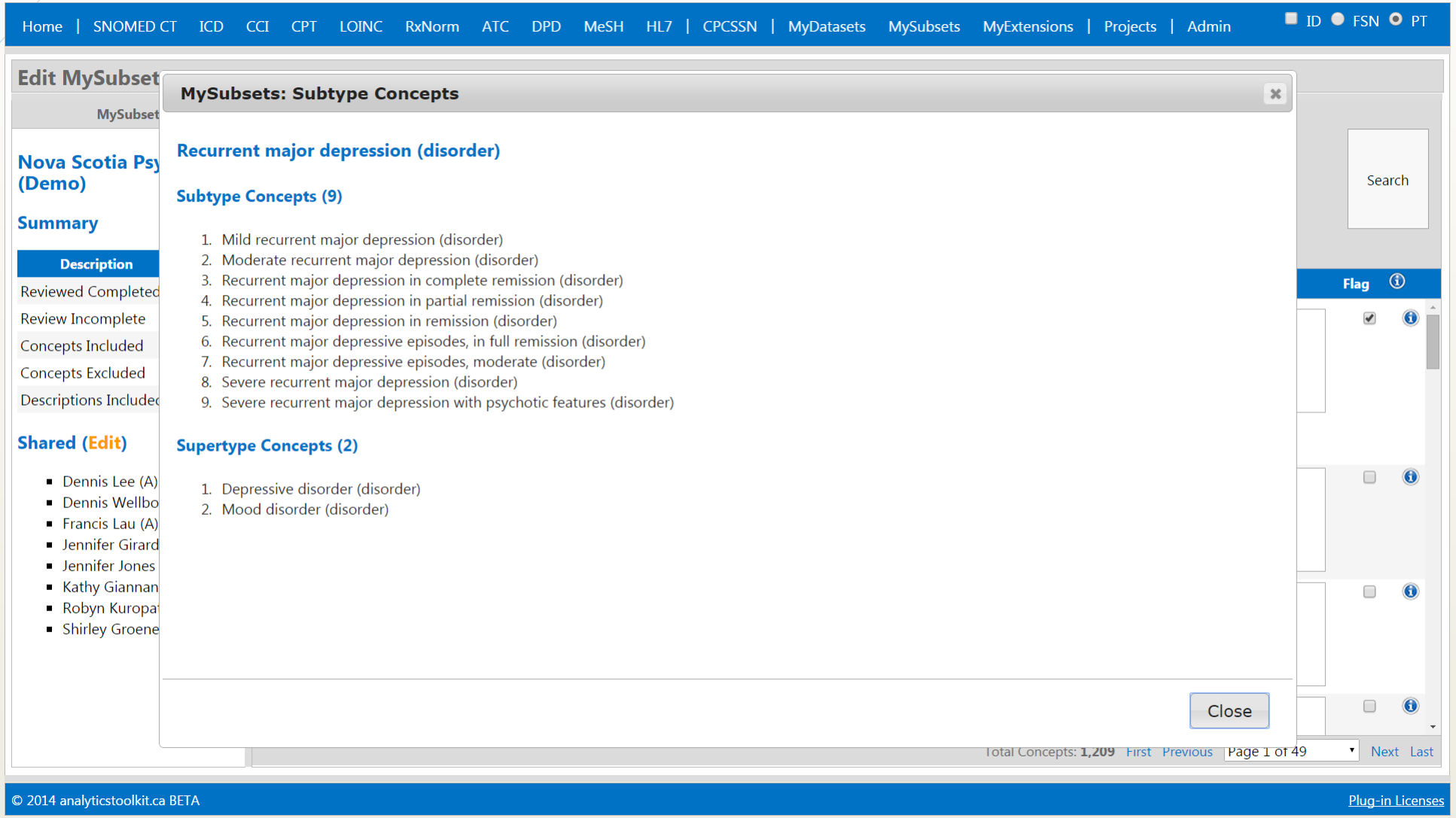
Cycle 2/3 Subset Management



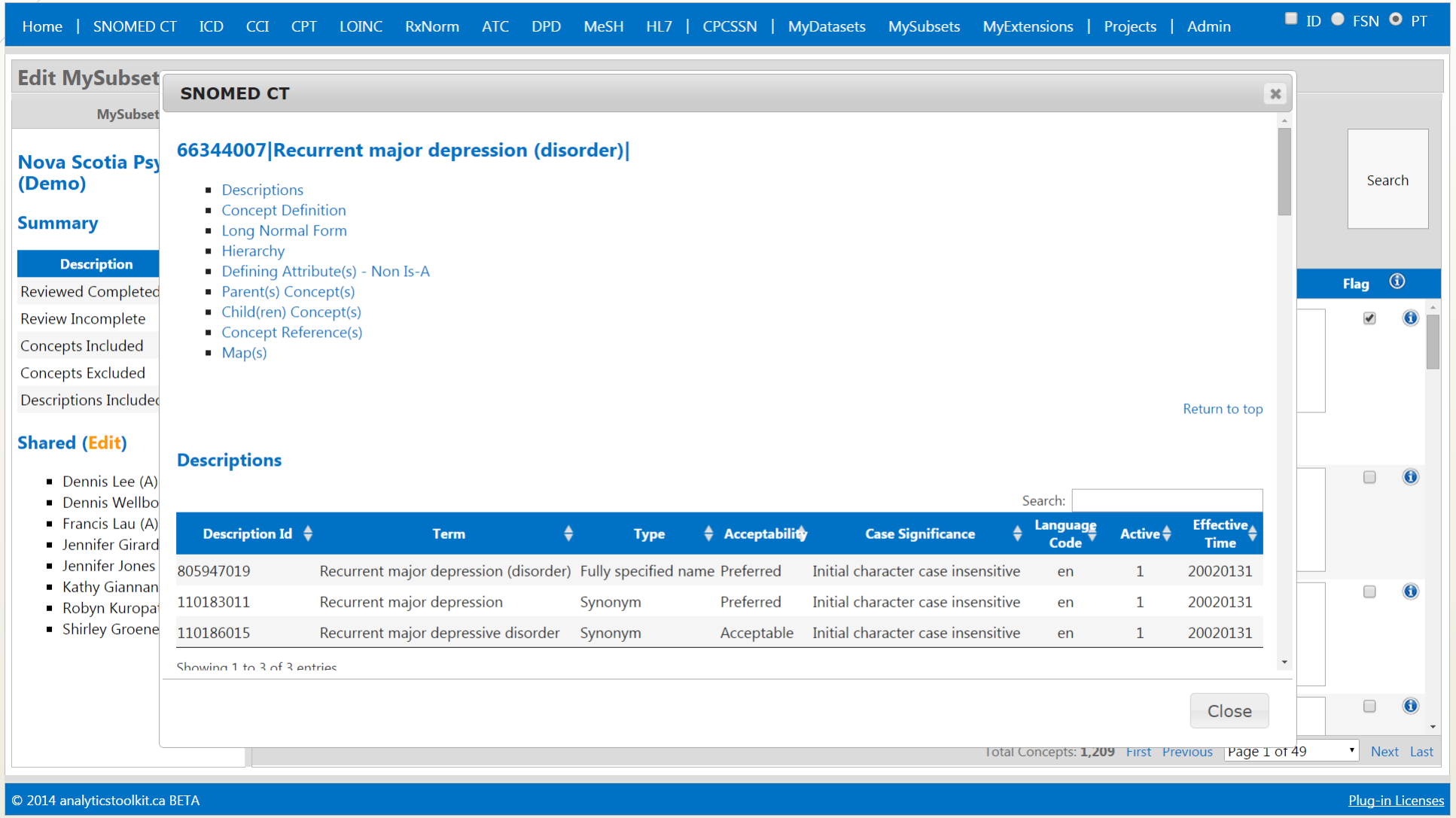
Cycle 2/3 Subset Editing



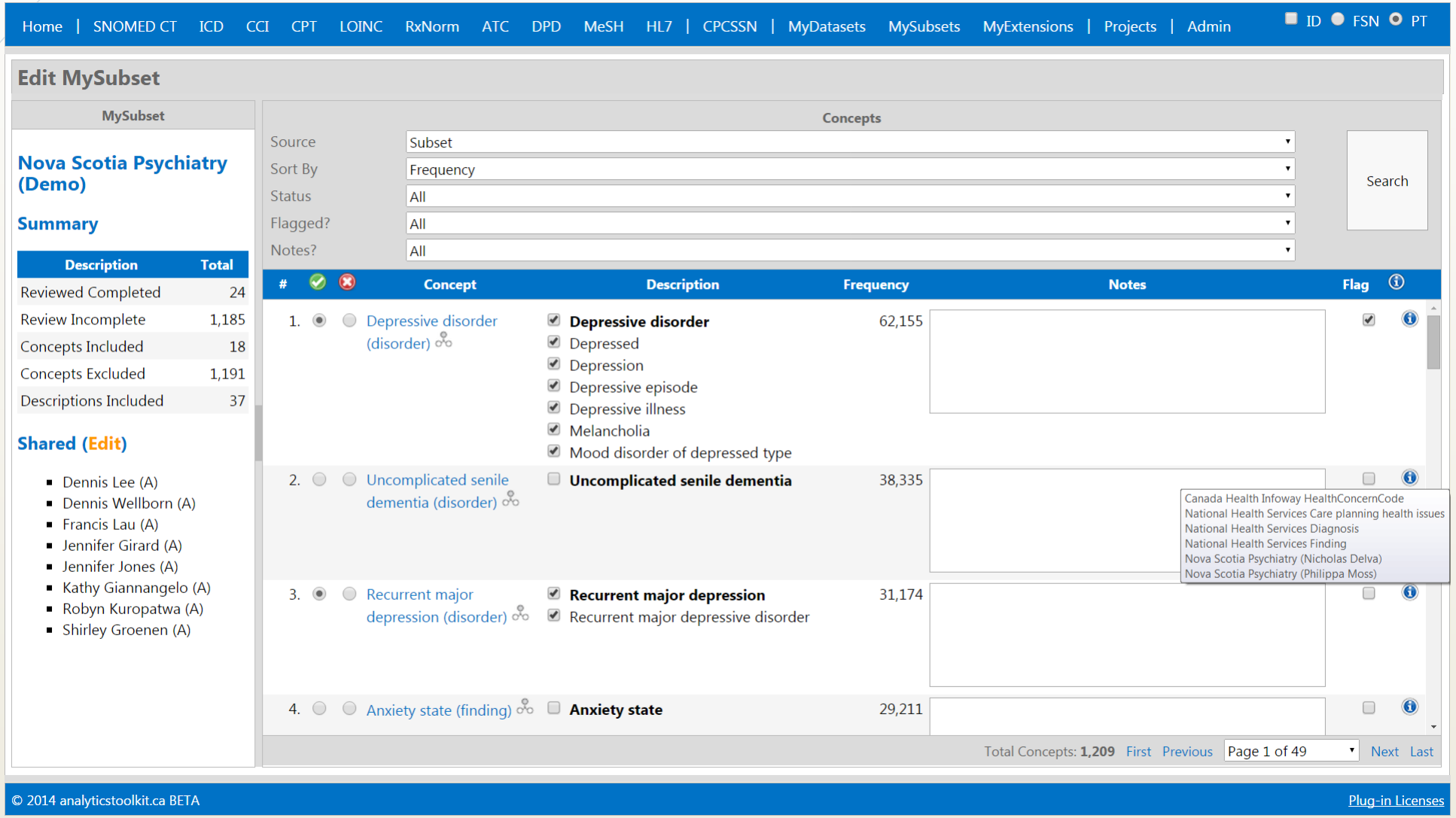
Cycle 2/3 Subset Editing



Cycle 2/3 Subset Editing



Cycle 2/3 Subset Editing



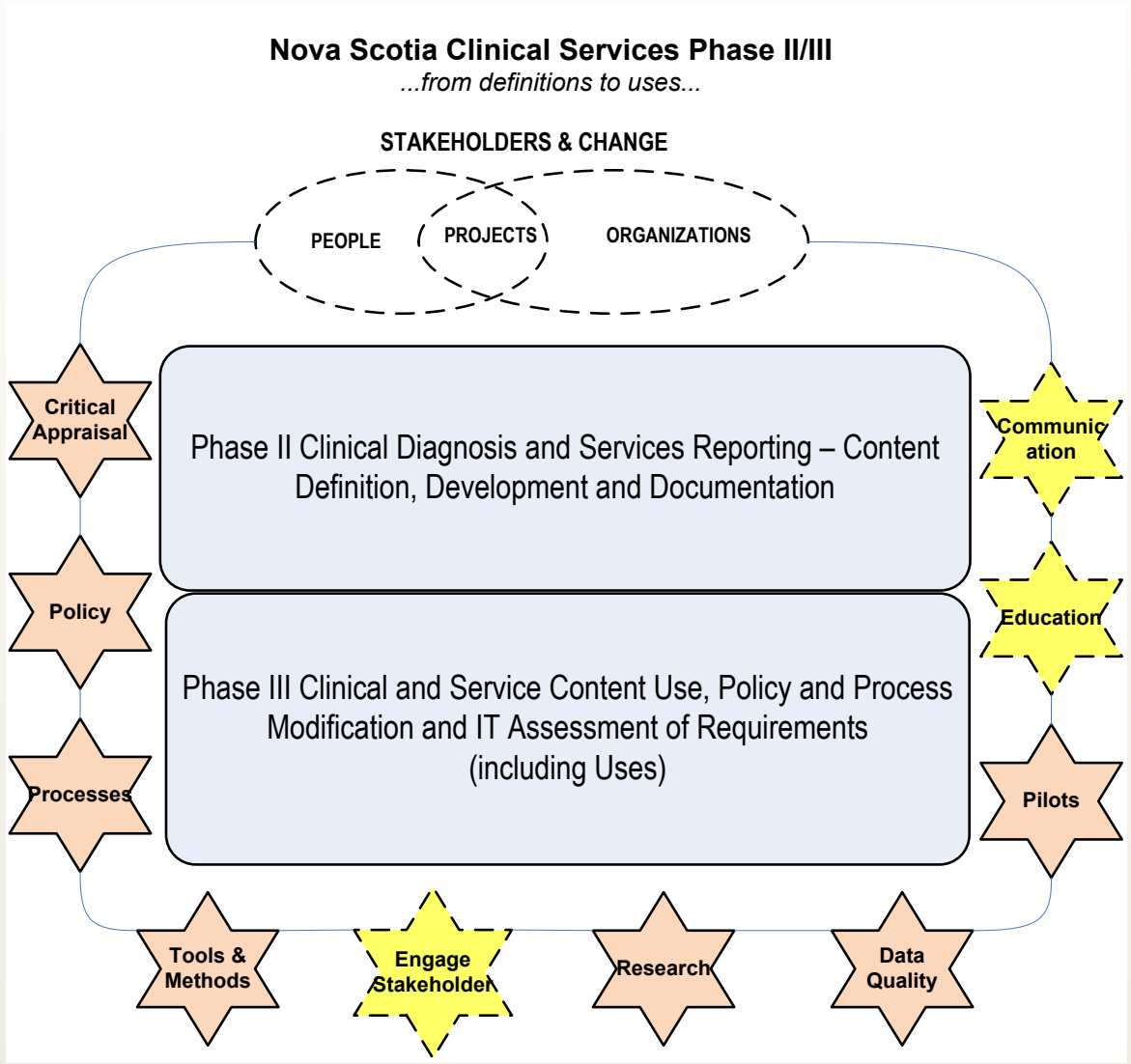
Lessons Learned and the Way Forward

Robyn Kuropatwa

Information Management First

- First do the information management work separate from the information technology – then define the intersection points
- Moving to standard terminologies/subsets in well-established programs with legacy information, processes and systems
  - Need to consider all components from definitions through to use
  - Diligence in understanding the old and proceeding with the new
  - Considering terminologies and related clinical term sets as provincial terminology assets with related/required supports/maintenance

Change Management – People and Processes



Layers of Documentation and Analyses

- Policy documents
- Project Methods and Approach
- Physician Engagement/Clinical Content Validation and Subset Development – need to be able to withstand long-term scrutiny
- Physician Claims - Data Analyses
  - Supports all project phases
  - Support all methods
  - Link Policy, information collected, system rules, explanatory codes
  - Old – New Cross-Walks

Approaches, Methods and Tooling

- Working through legacy
  - You have to consider the history at the same time you are building the future – it is not just reimbursement
  - Need to think from policy to use concurrently
- Approaches
- Methods
- Resource and Reference material
- Tooling
- Find, adapt, adopt – clinical specialty specific subsets

Over the Next 11 months

- Project Management
- Governance
- Change Management
- Program Policy
- Clinical Content – Specialty Specific Subsets (35)
- Information Management and Documentation (Subset Lifecycle)
- Data Uses

Questions and Thank You

- Questions
  -
  -
  -
- Thank you for your time. It has been a pleasure.