Encounter Data of VIHA and *its* emerging role in MHSU surveillance

Public Heath – PACE

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Island Health Transactional Encounter Data

Focus on Mental Health and Substance Use

- Acute Care + ED
- Ambulatory outpatient
- Inpatient Detox
- Home and Community Care
- Not yet
  - MSP
  - PharmaNet

TTT Cohort Definition

- Anybody (in VIHA records) who
- had contact with MHSU program and/or
- had a contact with any acute care service (acute care admission)
  - with an MHSU discharge diagnosis established
  - and/or had an MSHU procedure performed
- Current size: 170,054 patients

- (in future): and/or MHSU CEDIS presenting problem in ED

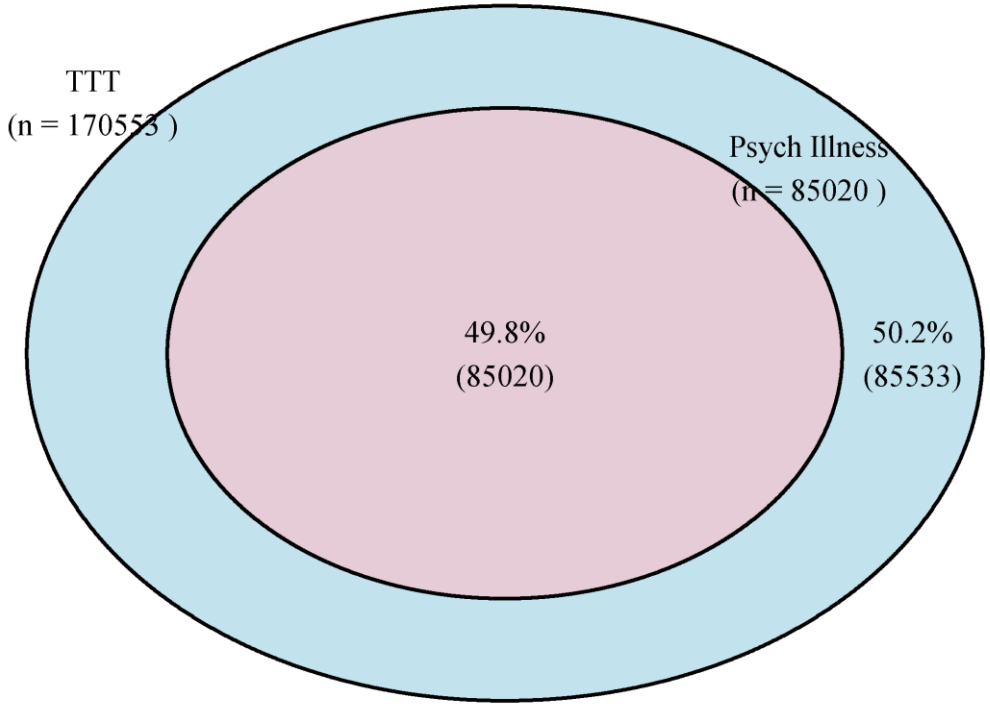
Reports that describe (sub)cohorts

- Cohort 0 - Transitions, Trajectories, Typologies (TTT) Research project cohort.
- Cohort 1 - Patients with encounters at hand-picked programs, engaging which was judged to be a sufficient evidence to qualify a person as having a "major substance use"
- Cohort 2 - Patients with encounters at hand-picked programs, engaging which was judged to be a sufficient evidence to qualify a person as having a "sever psychotic illness"
- Cohort 3 - Union of Cohorts 1 and 2
- Cohort 4 - Overlap of Cohorts 1 and 2

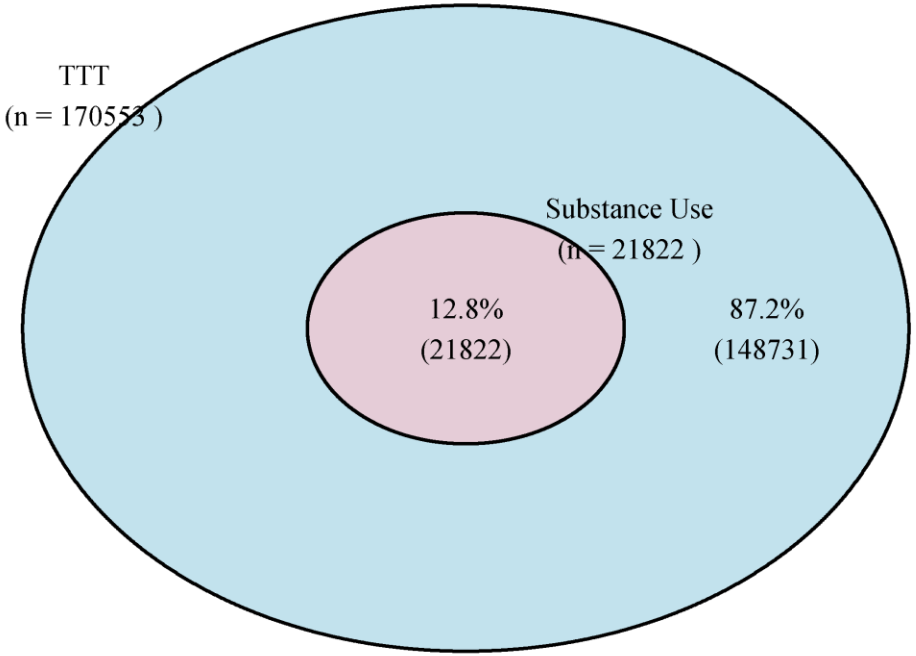
HTML reports are identical in form, but each take a subset of the Cohort 0.

- Cohort 5 - An experimental report. We are trying to create a cohort on the fly, in this case focusing on Neonatal services.

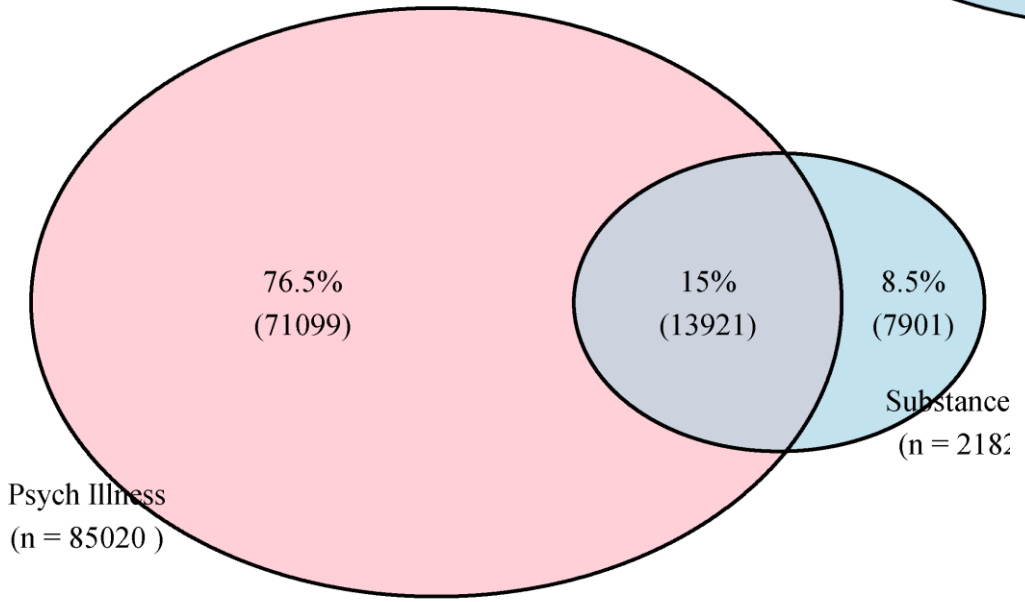
Psychotic Illness



Substance Use



TTT



Over Time

```
# what was the pattern of engagement over time?
ds %>% unique_sums(c("event_year")) %>% neat()
```

event_year	n_encounters	n_people	n_locations
2000	217	212	50
2001	213	211	47
2002	300	299	66
2003	330	326	79
2004	447	440	104
2005	702	680	125
2006	1137	1075	185
2007	2028	1906	250
2008	5637	5138	388
2009	11809	10476	491
2010	21216	17409	601
2011	471045	101214	1317
2012	685364	113885	1424
2013	691505	113602	1465
2014	699081	112540	1559
2015	690583	109571	1645
2016	653327	106916	1772
2017	213117	67023	1154

Cohort 0

Cohort 0

```
# how many unique programs were engaged by the cohort?
ds %>% distinct(location_map_id) %>% count() %>% neat()
```

n
2303

```
# what is the span of this cohort int the classification scheme?
# how many unique combination of values on (6) classifiers
ds %>% count_unique_classes() %>% neat()
```

compressor	compressor_unique	unique
intensity_type	17	153
intensity_severity_risk	39	153
clinical_focus	48	153
service_type	59	153
service_location	16	153
population_age	10	153

# of Classes

```
ds %>% unique_sums(c("location_class_code","location_class_description")) %>% arrange(desc(n_people)) %>% neat()
```

location_class_code	location_class_description	n_encounters	n_people	n_locations
78	ED - Med-Surg	887402	141754	95
148	Medical Imaging	648411	119550	52
146	Lab - Island Health - General	833549	109088	134
57	H&CC Services	131292	79030	8
66	Acute Care - Med-Surg - Mixed Ages	127659	57117	107

# of Classes

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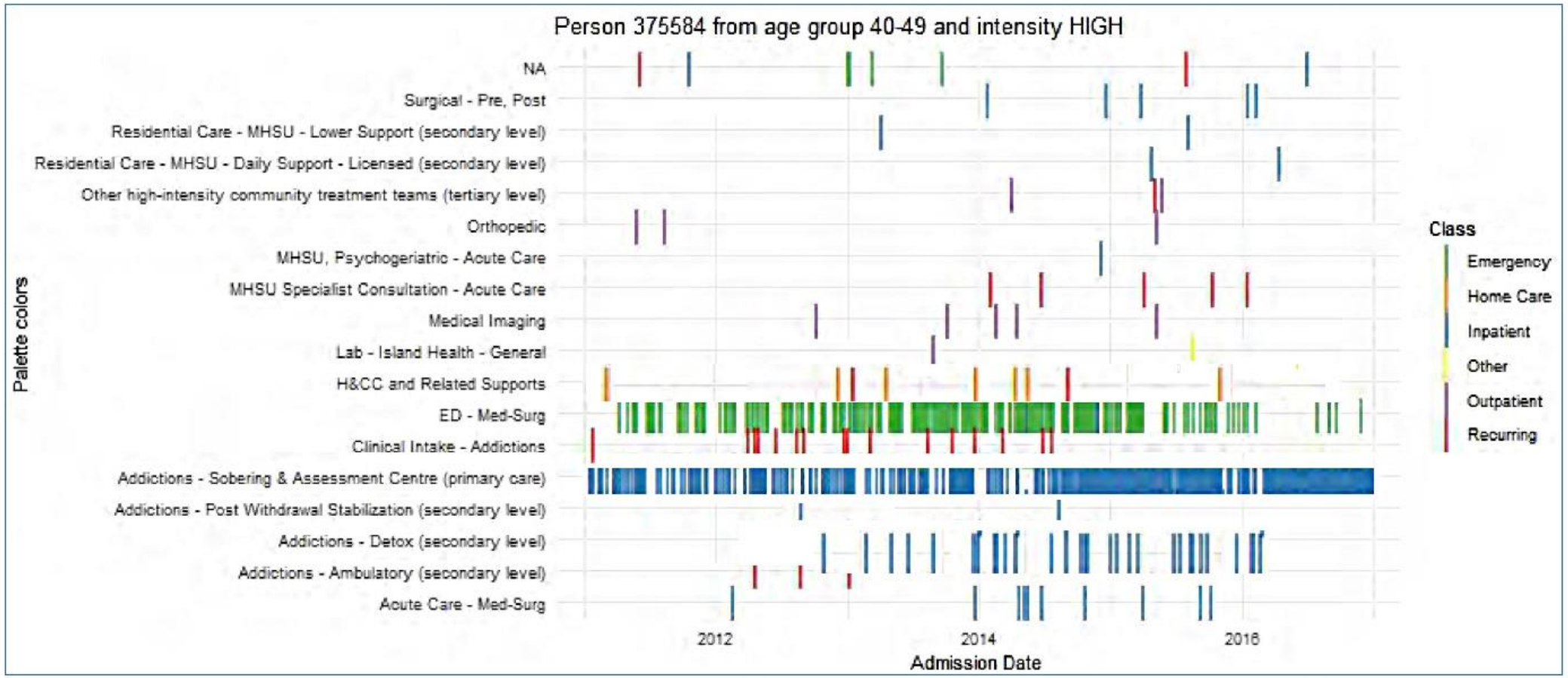
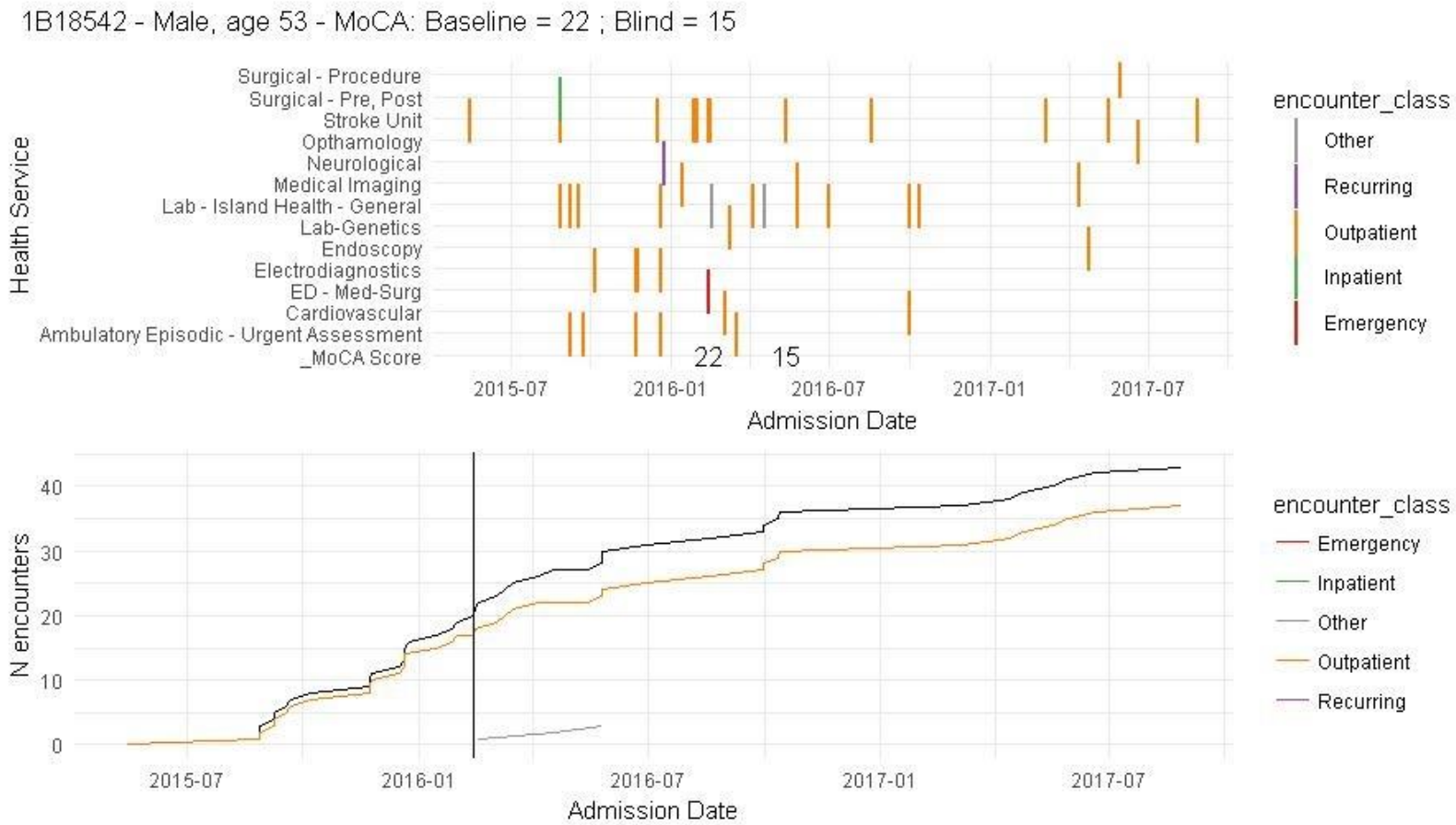
146	Lab - Island Health - General	833549	109088	134
57	H&CC Services	131292	79030	8
66	Acute Care - Med-Surg - Mixed Ages	127659	57117	107
34	Clinical Intake - Adult MHSU	73417	46158	21
140	Surgery - Same Day - Mixed Ages	53449	34363	24
145	Electrodiagnostics	89601	32366	10
142	Surgery - Post - Acute Care	45732	31765	35
135	Med-Surg - Ambulatory Mixed Episodic - Chronic - Mixed Ages	186901	26455	33
91	Endoscopy	38387	26006	17
138	Surgery - Prep - Recovery - Mixed Ages	34812	22639	29
37	Clerical Intake - Older Adults	37194	21907	5
43	Psychiatric [only] Clinic Services - Adults	32934	20858	32
16	Time-limited Ambulatory Treatment Services - Mental Health - Adults (secondary level)	27356	20785	29
108	Orthopedic - Ambulatory Lower Intensity	54257	19844	12
23	Addictions - Ambulatory (secondary level)	28410	15960	24
53	Residential Care - CHS - Licensed	24370	15446	199
3	Crisis Response Teams - One-time, High-intensity - Emergency Response	37460	15007	11

Cohort 0

Severe addiction



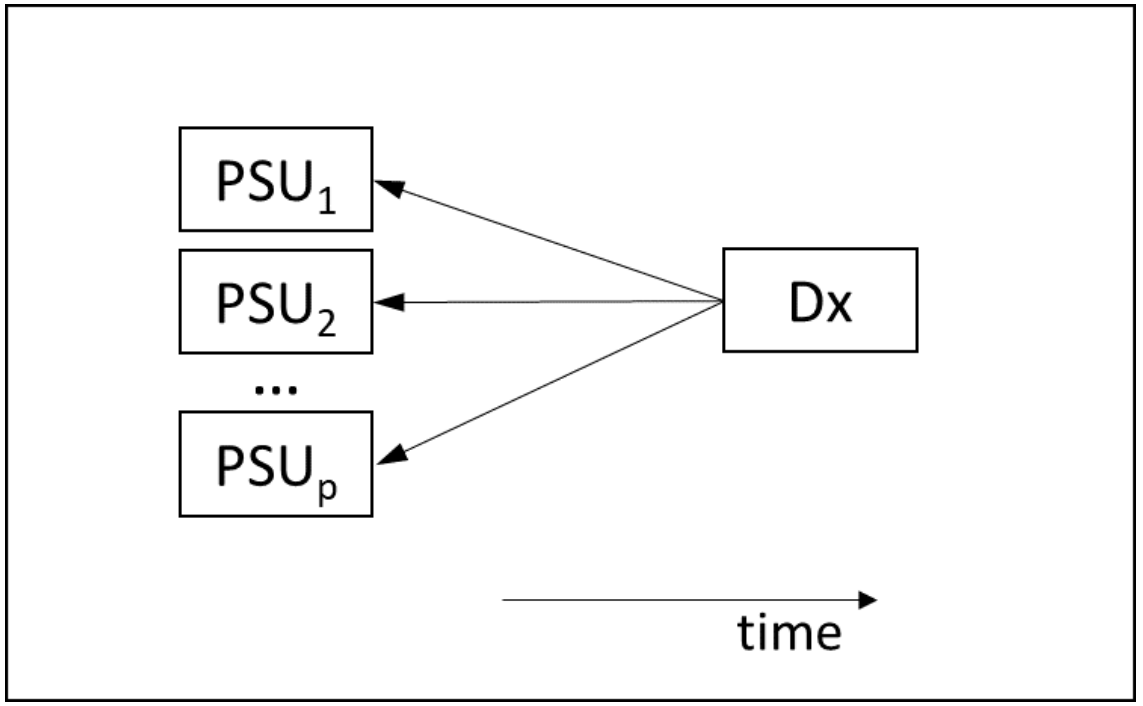
This is a fictional composite visualization based on data from several patients, cut and reassembled (Photoshop) to create an image that is representative of a single individual patient 'journey' through the array of secondary and tertiary services, but not actually reflecting at a row level the data of any patient.



This is a 53 year old male with extensive history of ischemic events, and who scored moderately low on both MoCA time points. Patients' slope of cumulative number of encounters with the system maintains a steady pattern of service utilization which may indicate that he retains unresolved health issues

Health System Impact Fellowship: Project 1

Stratifications of Clinical Histories



Question: Do individuals with certain diagnoses/event tend to have similar patterns of service utilization?

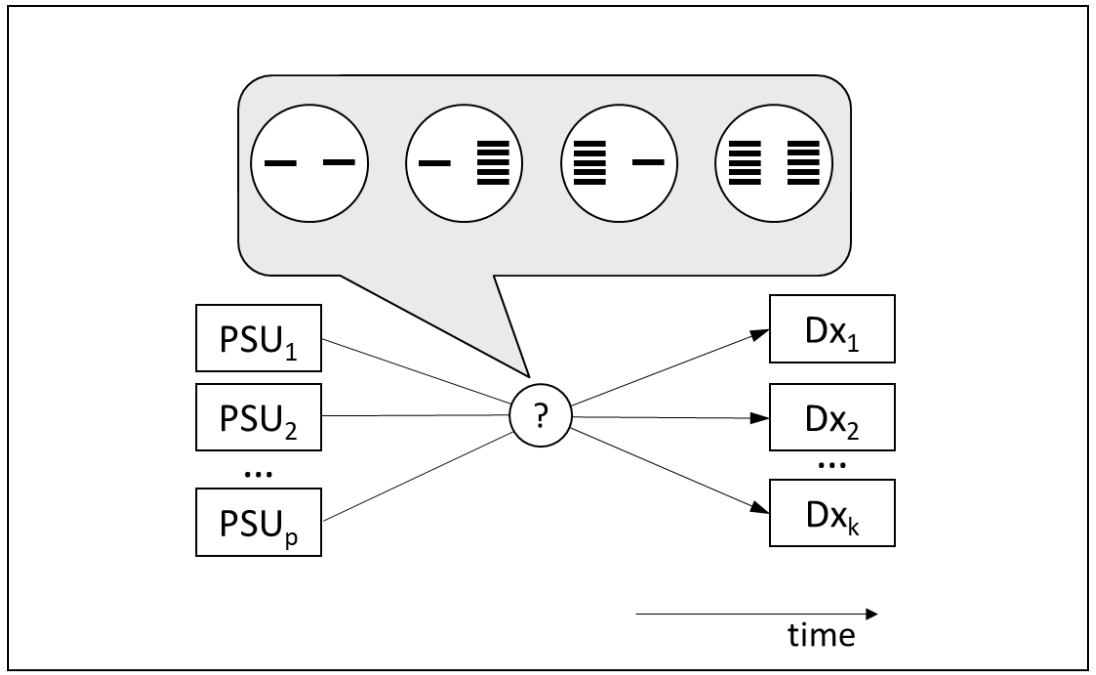
Premise: Transactional records of secondary and tertiary health services of Island Health are linked with substance use profile from MHSU-MRR profile, emergency room, and acute care records to assemble a data frame for estimating and training statistical models for identifying patterns of service use (PSU) related to specific health outcomes.

Applied Objective: Demonstrate *clinical heterogeneity of diagnostically homogeneous cohorts* by describing the variability in their clinical histories.

Methodological Question: How can we stratify patients on severity of condition and burden of disease based on their clinical history?

Health System Impact Fellowship: Project 2

Predictive Utility of Service Use



Question: What patterns of service utilization can help identify individuals at risk for an overdose event?

Premise: Using mathematical operationalizations of PSUs generated in Project 1 ("Stratifications of Clinical Histories") we establish statistical relationship between exhibiting a particular PSU and subsequently experiencing an overdose event(s).

Applied Objective: Identify the features of service use that differentiate individuals who go on to experience an opioid overdose event.

Methodological Question: A conceptualized and operationalized PSU may not have a strong predictive relationship with the outcome, so how do we screen for PSU that would be useful in predicting a particular health outcome?