

## **Data Impact Challenge Answer Submission Template**

**Question:** What portion of older adults (65+) has been prescribed antipsychotics to treat behavioral and psychological symptoms of dementia? Provide the relevant numerator and denominator.

### **Team and list of all team member names:**

- Team Name: Ontario Drug Policy Research Network (ODPRN)
- Team Members:
  - Kimberly Fernandes
  - Tara Gomes
  - Wayne Khuu
  - Diana Martins
  - Samantha Singh
  - Mina Tadrous

### **Describing the Data and Analysis**

- **Data Custodian Organization(s) and data sources:**
  - Data Custodian Organization: Institute for Clinical Evaluative Sciences. All datasets were linked using unique encoded identifiers and analyzed at the Institute for Clinical Evaluative Sciences (ICES).
- **List of Datasets Used (e.g. names of database and/or data origins):**
  - Registered Persons Database
    - Provides basic demographic information about anyone who has ever received an Ontario health card number. Data is supplied to ICES by the Ontario Ministry of Health and Long-term Care.
  - Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
    - After each patient is discharged from hospital, a medical records coder at the hospital draws up an abstract from the chart, compiling administrative and clinical data on that particular stay. Hospitals forward records to CIHI. Data is supplied to ICES by CIHI (result of a merger of the Management Information Systems Group (MIS) and the Hospital Medical Records Institute (HMRI) with the Health Information Division of Health Canada, Statistics Canada and the National Health Information Council).
  - Ontario Health Insurance Plan database (OHIP)
    - Contains claims by health care providers paid for by the Ontario Health Insurance Plan. Data is supplied to ICES by the Ontario Ministry of Health office in Kingston.
  - Ontario Drug Benefits Database (ODB)
    - Contains claims for prescription drugs received under the ODB program. Collected by Greenshield through an instant electronic collection. The data are extracted by Applied Communication Canada Inc. (A.C.C.I.).

- **Study Period**
  - April 1, 2003 to March 31, 2013
- **Numerator Population:**
  - Number of individuals aged 65 and older with a diagnosis of dementia who are prescribed an antipsychotic drug from the ODB program in each fiscal year.
  - **Inclusion/Exclusion Criteria:**
    - Include those with a diagnosis code for dementia within 5 years prior to end of each fiscal year (defined as per Rochon et al. [1]; see Appendix A) or those who were dispensed a prescription for a cognitive enhancer during each fiscal year (use would be indicative of dementia).
    - Exclude those who may be prescribed an antipsychotic for other psychoses: those with a diagnosis code of schizophrenia or other major psychoses, tics, or Huntington's disease within 5 years prior to end of each fiscal year (adapted from Rochon et al. [1]; see Appendix A), or those who were dispensed a prescription for a long-acting injectable antipsychotic during each fiscal year (use would be indicative of schizophrenia or bi-polar disorder; see Appendix A).
- **Denominator Population (Primary Analysis):**
  - Number of individuals aged 65 and older who are active beneficiaries of the ODB program defined as those who filled at least one prescription for any drug covered by ODB in each fiscal year .
  - **Inclusion/Exclusion Criteria:**
    - Exclude those not alive at the beginning of each fiscal year.
    - Exclude those with missing age or aged <65 as of end of each fiscal year.
- **Denominator Population (Secondary Analysis):**
  - Number of individuals aged 65 and older with a diagnosis of dementia that filled at least one prescription for any drug covered by ODB in each fiscal year.
  - **Inclusion/Exclusion Criteria:**
    - Include those with a diagnosis code for dementia within 5 years prior to end of each fiscal year (defined as per Rochon et al. [1]; see Appendix A) or those who were dispensed a prescription for a cognitive enhancer during each fiscal year (use would be indicative of dementia).
    - Exclude those who may be prescribed an antipsychotic for other psychoses: those with a diagnosis code of schizophrenia or other major psychoses, tics, or Huntington's disease within 5 years prior to end of each fiscal year (adapted from Rochon et al. [1]; see Appendix A), or those who were dispensed a prescription for a long-acting injectable antipsychotic during each fiscal year (use would be indicative of schizophrenia or bi-polar disorder; see Appendix A).
    - Exclude those not alive as of beginning of each fiscal year.
    - Exclude those with missing age or aged <65 as of end of current fiscal year.

- **Nature and Size of Cohort (e.g. geographic area covered, number of patients included):**
  - The study was conducted among older adults (aged 65 and older) in Ontario, Canada who are active beneficiaries of the ODB program. This was defined as individuals who filled at least one prescription for any drug covered by the ODB program in each year.
  - Cohorts were assembled for each year, from fiscal years 2003 to 2013.
  - The cohort population ranged from 1,469,348 individuals in 2003 to 1,992,521 in 2013.
  - Data timeframe: April 1, 2003-March 31, 2013

**Please provide a brief summary of the analysis methodology:**

For each fiscal year between 2003 and 2013, we calculated the denominator population as the number of individuals aged 65 and older in Ontario who were active beneficiaries of the ODB program. We calculated the numerator population as individuals aged 65 and older in Ontario who had a diagnosis of dementia and who were prescribed an antipsychotic drug. We excluded individuals with a diagnosis of schizophrenia or other major psychoses, tics, or Huntington’s disease or those using long-acting injectable antipsychotics since these are conditions where antipsychotics are indicated for the treatment of psychoses. In a secondary analysis, we calculated the denominator as individuals aged 65 and older in Ontario who were active beneficiaries of the ODB program and who had a diagnosis of dementia (excluding those with a diagnosis of schizophrenia or other major psychoses, tics, or Huntington’s disease or those using long-acting injectable antipsychotics). This was done to measure the proportion of antipsychotic use for behavioural and psychological symptoms of dementia among the subset of individuals at risk of receiving an inappropriate prescription. We presented our results stratified by whether the individual lived in a long term care (LTC) home or community setting to determine if differences in proportions existed in these settings.

**Describing the Findings (Figure 1):**

To identify the proportion of older adults prescribed an antipsychotic for behavioural and psychological symptoms of dementia (BPSD), we examined the rate among active beneficiaries of the ODB program. In our secondary analysis, we identified the proportion of active ODB beneficiaries with a diagnosis of dementia who were prescribed an antipsychotic to treat BPSD. We refer to individuals with “dementia” as those who had a diagnosis code for dementia in the past 5 years or were prescribed a cognitive enhancer and who do not have a co-existing diagnosis of schizophrenia or other major psychoses, tics, or Huntington’s disease, for which these medications might be indicated.

**Primary Analysis:**

- The number of individuals, aged 65 and older in Ontario, who were prescribed an antipsychotic to treat BPSD increased 30.0%, from 37,913 individuals in Fiscal Year (FY) 2003 to 49,288 individuals in FY 2013.

- Similarly, the number of active beneficiaries of the ODB program aged 65 and older in Ontario increased by 35.6%, from 1,469,348 individuals in FY 2003 to 1,992,521 individuals in FY 2013.
- The proportion of older adults who received an antipsychotic prescription to treat BPSD has remained relatively stable over the past 10 years. This proportion ranged from 2.6% in FY 2003 to 2.5% in FY 2013.
- There was wide variation in the rate of antipsychotic prescribing among older drug beneficiaries residing in LTC and community settings, with the highest rates found in LTC settings. In FY 2013, 29.9% of beneficiaries residing in LTC received an antipsychotic prescription to treat BPSD compared to only 1.4% in the community setting. Similar to overall rates, the rates in LTC and community settings have remained relatively stable over time (range of 30.1% [FY 2003] to 29.9% [FY 2013] and 1.3% [FY 2003] to 1.4% [FY 2013], respectively).

### Secondary Analysis

- The number of active beneficiaries of the ODB program, aged 65 and older, who had a diagnosis of dementia increased by 60.0% over the study period, from 144,325 individuals in FY 2003 to 230,938 individuals in FY 2013.
- The proportion of older adults with dementia who were dispensed an antipsychotic to treat BPSD decreased by 4.9%, from a prevalence of 26.3% in FY 2003 to 21.3% in FY 2013.
- The proportion of older adults with dementia receiving an antipsychotic to treat BPSD is higher among those living in LTC compared to those living in community. In 2013, the proportion of older adults with dementia being treated with antipsychotics was 38.9% in LTC compared to 15.5% in the community setting.
- The proportion of older adults with dementia treated with antipsychotics in LTC and the community has been decreasing over time, with a 3.8% decrease in LTC and a 3.4% decrease in the community observed between 2003 and 2013.

To summarize, the rate of antipsychotic prescribing to treat BPSD among active ODB beneficiaries has remained constant across the 10 year study period. Interestingly, rates of antipsychotic prescribing to treat BPSD among patients with dementia have decreased by about 5% from 2003-2013 in both the LTC and community setting, which may be due to the growing attention of the overuse of antipsychotics. The proportion of older adults prescribed an antipsychotic for BPSD is higher in LTC settings compared to community settings, which is consistent with previous findings from other provinces across Canada. The proportion of antipsychotic prescribing to treat BPSD among patients with dementia was still higher in LTC compared to community, which raises the importance of studying this population in Ontario and across Canada.

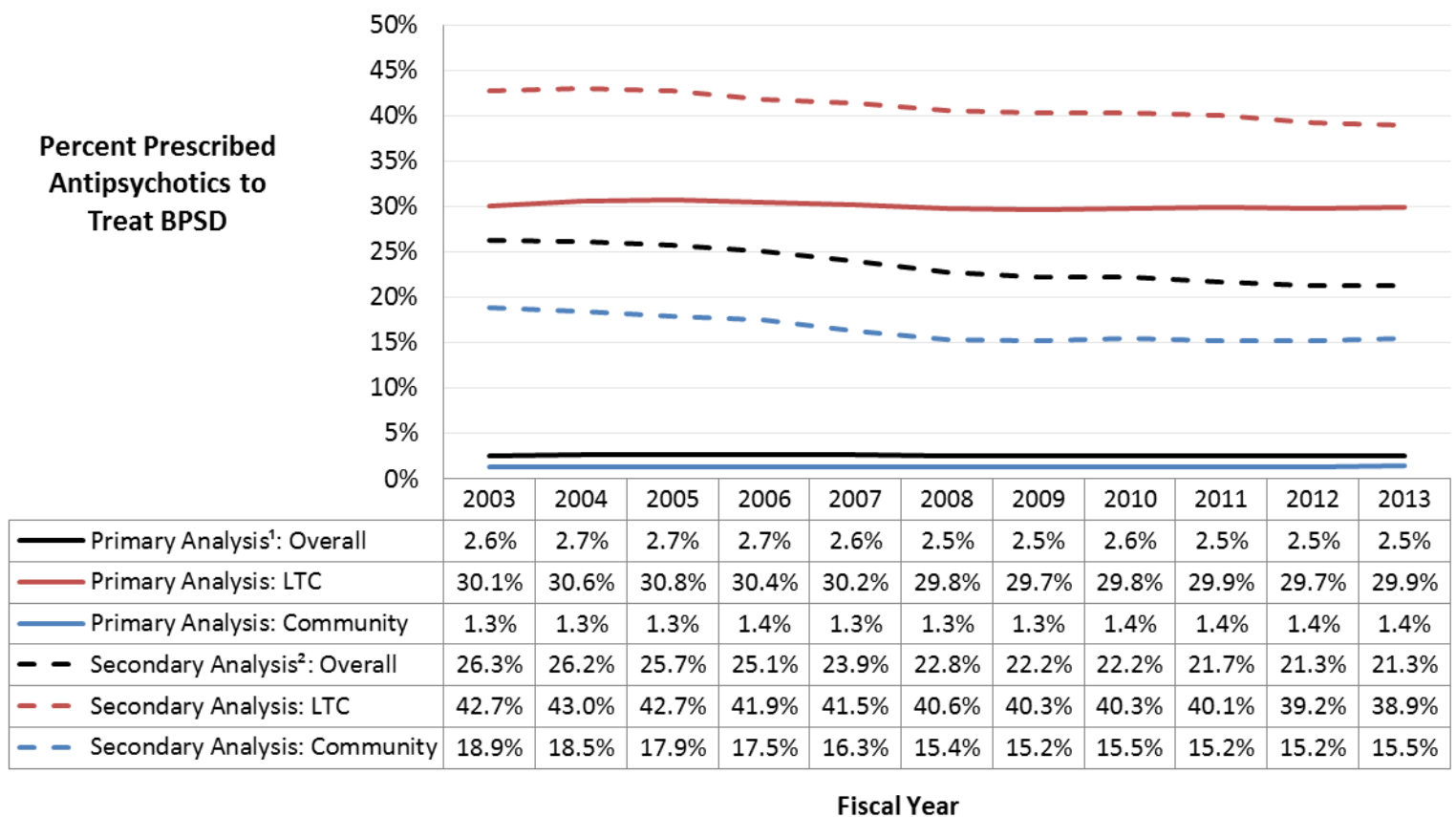
### Key limitations or Interpretation Issues:

- These findings represent adults aged 65 and older in Ontario who are eligible for the ODB program; therefore the generalizability to all persons with dementia across Canada may be limited. However, because all individuals aged 65 and older are eligible for the ODB program,

and since the dementia population is generally older than 65 years of age, this analysis likely represents the vast majority of individuals with dementia living in Ontario.

- In regard to the Choosing Wisely Canada recommendation, it is not known whether other non-pharmacologic therapies have been attempted in these patients prior to receiving an antipsychotic prescription.
- Finally, antipsychotics may be prescribed off-label to treat insomnia. Although our patient population is limited to individuals with dementia and no mental health indications, some antipsychotic prescriptions may be for the treatment of insomnia rather than for BPSD.

**Figure 1: Proportion of older adults (65+) prescribed antipsychotics to treat behavioral and psychological symptoms of dementia, between fiscal years 2003 and 2013 in Ontario**



<sup>1</sup>Primary Analysis: Denominator calculated as active beneficiaries of the ODB program

<sup>2</sup>Secondary Analysis: Denominator calculated as active beneficiaries of the ODB program who had a diagnosis of dementia

**Appendix A: Data Sources and Codes used to define Dementia**

<b>Medical Diagnoses:</b>			
Dementia	OHIP or DAD and ODB	1 code during 5 year look back of the following in CIHI-DAD: <b>ICD-9 Diagnosis Code:</b> 290 3310 3312 3317 3318 3319 797 OR <b>ICD-10 Diagnosis Code:</b> F00 F01 F023 F03 F051 F09 G30 G311 R54 OR <b>OHIP Diagnosis Code:</b> 290 331 797 OR Prescription for a cognitive enhancer in past 1 year	
Bipolar Disorder, Schizophrenia or other major psychoses, tics, or Huntington’s disease	OHIP or DAD and ODB	1 code during 5 year look back of the following in CIHI-DAD: <b>ICD-9 Diagnosis Code:</b> 295 296 2972 2980 2981 2984 2988 3072 3334 OR <b>ICD-10 Diagnosis Code:</b> F20 F21 F250 F251 F252 F30 F31 F322 F323 F332 F333 G10 F95 OR <b>OHIP Diagnosis Code</b> 295 296 299 OR Prescription for a long acting antipsychotic in past 1 year	
<b>Drugs of Interest:</b>			
Cognitive Enhancers	ODB	<ul style="list-style-type: none"> <li>• Donepezil</li> <li>• Galantamine</li> <li>• Rivastigmine</li> </ul>	
Antipsychotics	ODB	Typicals <ul style="list-style-type: none"> <li>• Chlorpromazine</li> <li>• Flupentixol</li> <li>• Fluphenazine</li> <li>• Haloperidol</li> <li>• Loxapine</li> <li>• Methotrimeprazine</li> <li>• Periciazine</li> <li>• Perphenazine</li> <li>• Pimozide</li> <li>• Pipotiazine</li> <li>• Prochlorperazine</li> <li>• Thioridazine</li> <li>• Thiothixene</li> <li>• Trifluoperazine</li> <li>• Zuclopenthixol</li> </ul>	Atypicals <ul style="list-style-type: none"> <li>• Aripiprazole</li> <li>• Asenapine</li> <li>• Asenapine</li> <li>• Clozapine</li> <li>• Olanzapine</li> <li>• Lurasidone</li> <li>• Paliperidone</li> <li>• Quetiapine</li> <li>• Risperidone</li> <li>• Ziprasidone</li> </ul>

**References:**

1. Rochon, Paula A., et al. "Variation in nursing home antipsychotic prescribing rates." *Archives of internal medicine* 167.7 (2007): 676-683.