



Clinical and Sociodemographic Profile of Older Adults Cared for by Nurse Practitioners Compared to Family Physicians in Ontario, 2000-2015: A Descriptive Retrospective Cohort Study

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Abstract:	<p>Background. Nurse practitioners (NPs) are an integral component of healthcare delivery in Ontario. In comparison to family physicians (FPs) there is a poor understanding, at a population level, of patients in NPs'practices. To address this knowledge gap, we used Ontario administrative databases to identify the sociodemographic characteristics and co-morbidities of patients 65 years and older cared for by NPs and FPs between 2000 and 2015.</p> <p>Methods. This population-based descriptive retrospective cohort study included patients ≥ 65 years with Ontario Health Insurance Plan (OHIP) eligibility and at least one prescription encounter with a NP or FP during the study period. Prescription identification of patients permitted their characterization by age, sex, geographical location, rurality, neighbourhood income, and comorbidities. Patients were categorized as having NP, FP or shared care based on the percentage of patient prescription encounters with NPs versus FPs.</p> <p>Results. By 2015, older patients cared for by NPs were female (59%) and residents of low-income neighbourhoods (44%) living outside of central Ontario. In contrast, patients cared for by FPs were older and residents of higher income and urban areas. Elixhauser comorbidity scores were consistently lower among patients cared for by NPs than those predominantly seen by FPs. Most prevalent conditions were hypertension and diabetes, regardless of provider.</p>

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	<p>Interpretation. Patient comorbidities did not vary substantially between provider groups. The patient characteristic with highest variability between providers was geographical residence in the province. Elucidating patterns of care is critical for primary care policy; our results provide baseline data for future healthcare planning</p>

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STROBE Statement—Checklist of items that should be included in reports of *cohort studies*

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-5
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	5
		(b) For matched studies, give matching criteria and number of exposed and unexposed	n/a
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5-6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4-5
Bias	9	Describe any efforts to address potential sources of bias	10
Study size	10	Explain how the study size was arrived at	n/a
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	6
		(b) Describe any methods used to examine subgroups and interactions	n/a
		(c) Explain how missing data were addressed	n/a
		(d) If applicable, explain how loss to follow-up was addressed	n/a
		(e) Describe any sensitivity analyses	n/a
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Fig.1 Tabl.1
		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	20
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6-7
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	Report numbers of outcome events or summary measures over time	6-7

1	Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
2			(b) Report category boundaries when continuous variables were categorized	
3			(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
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9	Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	n/a
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11	Discussion			
12				
13	Key results	18	Summarise key results with reference to study objectives	9-10
14	Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10
15				
16	Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	9-11
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19	Generalisability	21	Discuss the generalisability (external validity) of the study results	11
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21	Other information			
22	Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	11
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*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at <http://www.strobe-statement.org>.

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Clinical and Sociodemographic Profile of Older Adults Cared for by Nurse Practitioners

Compared to Family Physicians in Ontario, 2000-2015:

A Descriptive Retrospective Cohort Study

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Elizabeth G. VanDenKerkhof, RN, DrPH

ABSTRACT**Clinical and Sociodemographic Profile of Older Adults Cared for by Nurse Practitioners Compared to Family Physicians in Ontario, 2000-2015: A Retrospective Cohort Study**

Background. Nurse practitioners (NPs) are an integral component of healthcare delivery in Ontario. In comparison to family physicians (FPs) there is a poor understanding, at a population level, of patients in NPs' practices. To address this knowledge gap, we used Ontario administrative databases to identify the sociodemographic characteristics and co-morbidities of patients 65 years and older cared for by NPs and FPs between 2000 and 2015.

Methods. This population-based descriptive retrospective cohort study included patients ≥ 65 years with Ontario Health Insurance Plan (OHIP) eligibility and at least one prescription encounter with a NP or FP during the study period. Prescription identification of patients permitted their characterization by age, sex, geographical location, rurality, neighbourhood income, and comorbidities. Patients were categorized as having NP, FP or shared care based on the percentage of patient prescription encounters with NPs versus FPs.

Results. By 2015, older patients cared for by NPs were female (59%) and residents of low-income neighbourhoods (44%) living outside of central Ontario. In contrast, patients cared for by FPs were older and residents of higher income and urban areas. Elixhauser comorbidity scores were consistently lower among patients cared for by NPs than those predominantly seen by FPs. Most prevalent conditions were hypertension and diabetes, regardless of provider.

Interpretation. Patient comorbidities did not vary substantially between provider groups. The patient characteristic with highest variability between providers was geographical residence in the province. Elucidating patterns of care is critical for primary care policy; our results provide baseline data for future healthcare planning.

Word count: 249

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INTRODUCTION

Integrated, patient-centered care is a central tenant within Ontario's primary healthcare system.¹ One proposed mechanism to achieve integrated patient-centered care is the introduction of nurse practitioners (NPs) into various primary healthcare models.¹⁻⁴ In Ontario, NPs practice at an advanced level, are educated in graduate schools, typically work within an interdisciplinary team, and are prepared to assess, diagnose and manage patient conditions that present in primary, long-term, and tertiary care settings.⁵⁻⁶ In 2018, 3,442 NPs were registered to practice in Ontario, with 75% working in primary care,⁷ and constituted over half of all licensed Canadian NPs.⁸

Numerous studies over the past forty years have ascertained the safety of NP practice, most often comparing equivalencies between NPs and their physician counterparts.⁹⁻¹⁴ Recent effectiveness studies have examined NP practice in primary care,¹⁵⁻¹⁷ tertiary care,¹⁸⁻²⁰ and specialized settings, including care of rural frail elderly clients²¹, those with diabetes²² and dementia.²³ While there is a large body of knowledge on the safety, effectiveness and role development of NP practice,²⁴⁻³⁰ minimal information is available on Ontario patients cared for by NPs, a gap we identified in our previous work.³¹ Recent evidence regarding NP practice in Ontario is emerging. In 2012, the Centre for Rural and Northern Health Research (CRaNHR) in Sudbury, Ontario, gathered information on NP client populations using a comprehensive survey and reported that the majority of Ontario NPs' clientele were adults (42%) and seniors (32%).³² While the sampling frame included all practicing NPs, only 48% (n=693) responded. Using Ontario Nurse Practitioner Access Reporting (NPAR) pilot project data,³³ Heale and colleagues recently reported NP encounter data from 34 family health teams (FHTs) in 2014/2015, linked with other provincial administrative databases.³⁴ They found NPs saw a wide range of acute

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(22%) and chronic (20%) conditions, with hypertension as the most common comorbidity, followed by asthma. The authors acknowledge that only 2.9% of all Ontario primary healthcare NPs were represented. Despite these advances, a poor understanding of population-level characteristics of patient encounters with NPs remains, including geographical variation and trends in population characteristics. To address this knowledge gap, we used Ontario administrative health databases to identify and categorize the clinical and sociodemographic profile of patients 65 years and older cared for by Ontario NPs and family physicians (FPs) between 2000 and 2015.

METHODS***Study Design and Data Sources***

This was a population-based, retrospective cohort study that described the characteristics of patients over 65 years or older cared for by NPs and FPs in Ontario, Canada. The Corporate Provider Database (CPDB), derived from the lists of health care professionals registered with each respective licensing college, was used to obtain practice information as well as a prescriber ID for NPs and physicians with an Ontario Health Insurance Plan (OHIP) billing number; and the ICES Physician Database (IPDB) was used to identify FPs through a physician's main specialty. The prescriber IDs of the identified NPs and FPs were used to link to prescriptions dispensed to older adults (≥ 65 years) covered under Ontario's Drug Benefit program (ODB), which contains detailed information on all outpatient prescriptions covered by the provincial drug formulary. Linkage to the Registered Persons Database (RPDB) provided us with basic demographic information for all residents who had ever received an OHIP number. These databases were linked using unique encoded identifiers (Figure 1) and analyzed at ICES. The study was approved by the Research Ethics Board of Queen's University in Kingston, Ontario.

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Study Population

The study included Ontario residents who were ≥ 65 years of age with a valid ICES key number; alive and eligible for health care; and who had at least one prescription by a NP or FP dispensed in each year over the study period from Jan. 1, 2000 to Dec. 31, 2015. Each prescription dispensation date with the same provider was counted as one encounter. Total number of encounters with NPs and FPs were calculated for each patient in each study year. Patients within each study year were assigned to one of three care provider groups (NP, FP, and shared care group) based on the percentage of his or her encounters with NPs versus FPs. Within each study year, patients who had more than 70% of their encounters with NPs were attributed to the NP care group, and patients who had more than 70% of their encounters with FPs were attributed to the FP care group. Those with less than 70% of their encounters with either group were attributed to the shared care group. The 70% cut-off was determined based on the distribution of NP and FP encounters in each study year and the existing literature.²⁷

Patient Characteristics

Patient characteristics including age, sex, geographic region of residence, neighbourhood income quintile, rurality of residence, marginalization index, and comorbidity were described by provider care groups within each study year. Age was defined at first dispensation date in each year. Geographic region of residence at the first dispensation date was described at the level of the 14 Local Health Integration Networks (LHIN) in Ontario.³⁵ Neighbourhood income quintiles were based on the average household income in a neighbourhood census tract and ranked into five ascending categories, with the lowest quintile representing the least affluent neighbourhoods.³⁶ Rurality was measured using the Rurality Index for Ontario 2008, with a score less than 40 being urban.³⁷ The Ontario Marginalization Index is a geographically based

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3 index developed to quantify the degree of marginalization occurring across the province, with a
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5 quintile of five reflecting the greatest magnitude of marginalization.³⁸ It is comprised of four
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7 major dimensions thought to underlie the construct of marginalization: residential instability,
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9 material deprivation, dependency and ethnic concentration. Comorbidity was classified using the
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11 Elixhauser Comorbidity Index, a measurement score that includes 30 co-existing conditions,
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13 based on the International Classification of Diseases (ICD) diagnosis codes found in the hospital
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15 abstracts data (CIHI-DAD) and in the medical services (OHIP) data within 2 years prior to first
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17 dispensation date.³⁹⁻⁴⁰
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Analysis

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24 Patients in each of the provider groups were described per year with respect to the
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26 number of encounters and sociodemographic characteristics. To examine geographic variation in
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28 the pattern of encounters, we mapped the proportion of patients cared for by each provider group
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30 within each of Ontario's 14 health regions by study year. The proportion of patients with each
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32 Elixhauser comorbid condition within each provider group per study year were generated and
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34 ranked to identify the five most common comorbid conditions by provider group. All analyses
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36 were performed using SAS[®] version 9.4 (SAS Institute, Cary, NC).
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RESULTS

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42 Over the 15 years, the total number of NPs who prescribed to patients 65 and older
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44 increased by 2439 from 340 in 2000, whereas an additional 3514 FPs prescribed to older adults
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46 from the baseline of 10,201 FPs in 2000. The numbers of NPs and FPs who prescribed to older
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48 adults over the study period are presented in Table 1. Both provider groups experienced an
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50 increase in the provider-to-patient ratio over time. In 2010, over 99% of patients were assigned
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52 to FP care; by 2015, the relative number of patients who received more than 70% of care from
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FPs had dropped to 97%, with patients assigned to shared care, followed by NP care at slightly over 1% each (data not shown).

Clinical and Sociodemographic Profile

By 2010, nearly 41% of older adults receiving care from NPs, compared to FPs (30.4%) and those in shared practice (35.2%), were between the ages 65 to 69 (Table 2). Interestingly, the highest proportion of those 85 years old and older (16.5%) were cared for by shared care providers in 2015. Female patients consistently were more likely to receive care from either NPs or shared care practices. During the study period, proportionately more older patients living in low income quintile neighbourhoods were cared for by NPs or shared care compared to their FP counterparts; however, the mean marginalization index was intermediate for all patients, regardless of provider group across the study timeframe. Most patients who lived in rural areas of Ontario in 2005 received shared care (~51%), followed by care from a NP (~30%). By 2010, this had changed, as 47% of those assigned to NPs were rural residents, and 41% of shared care prescription encounters were with rural patients. These proportions dropped in 2015 with the percentage of care by NPs to rural residents at 37%, and 28% among shared care providers. The proportion of rural patients seen predominately by FPs was consistently around 14%. In sum, by 2015, older patients cared for by NPs were typically between 65-69 years of age (40%), female (59%), residents of neighbourhoods in the lowest two income quintiles (44%), and living in rural Ontario (37%) (Table 2).

The provincial LHIN geographical distributions of older adults by provider groups in 2005 and 2015 are depicted in Figure 2. In 2005, the total numbers of NP encounters were small, but of these patients, the highest proportions (depicted in red) resided in the South West LHIN (37%) and the North East LHIN (14%). By 2015, the proportion of older patient

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encounters by NPs in the South West region had dropped (12%), with the highest proportion of encounters in the North East LHIN (21%). For FPs in 2005, the greatest proportion of older patient encounters were in the Hamilton Niagara Haldimand Brant LHIN (~13%), followed by the Central East (~12%) and Central (11%) regions. The distribution of older patient encounters by FPs did not change appreciably between 2005 and 2015. The distribution of older patients cared for by shared care providers in 2005 was highest in the North East (23%) and in the Central East LHIN (13%). In 2015, older adult encounters for shared care providers were highest in the following LHINs: North East (~14%); Hamilton Niagara Haldimand Brant (12%); South East (10%); and, South West (10%). See Table 2 for data on all LHINs.

The mean prescription encounters per patient for FPs rose slightly over the study duration (Figure 3). After the establishment of FHTs in 2005, the mean patient encounters for NP and shared care practice began to increase. For shared practice providers, the mean number of encounters per patient were similar to that of FPs by 2015. The mean number of NP encounters per patient increased from 1.4 to 10.9 between 2000-2015.

Uncomplicated hypertension was the number one comorbidity of older patients across the entire study time span, regardless of provider group, followed by diabetes mellitus (data not shown). A total of seven conditions were the top five patient comorbidities in this population over the 15 years: hypertension; diabetes; depression; cardiac arrhythmias; solid tumours; chronic pulmonary disease; and, congestive heart failure. The Elixhauser Comorbidity Index scores were relatively low for patients who primarily had NP encounters (Figure 4). Conversely, but not unexpectedly, the comorbidity index of patients who had shared providers consistently increased, and by 2015, was similar to that of patients seen predominately by FPs.

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DISCUSSION

During the 15-year study period, NP prescription encounters with Ontario residents over the age of 65 increased; the low mean patient prescription encounters by NPs in the early 2000's partially reflects the restrictive provincial formulary list in place until 2011.³¹ Overall, higher proportions of patients with NP encounters occurred within shared, inter-disciplinary care. Two previous Ontario studies that classified primary care encounters similarly reported higher proportions of shared care in community health clinics (CHCs)²⁷ at 18% and in FHTs³⁴ at nearly 7%, in comparison to our finding of slightly more than 1%. This is not unexpected, as our study incorporated all practice types and was restricted to patients 65 years and older. Similar to our findings, patients cared for by NPs in the United States (U.S.) were more likely to be female⁴¹⁻⁴³ and to reside in rural or underserved areas.^{22, 41-44} Contrary to findings from Ontario CHCs²⁷ and the U.S.,⁴³ where higher proportions of patients of all ages cared for by NPs were reported as marginalized, we did not find variation in the marginalization index of older adults across provider groups.

It is reassuring to observe that patients who were primarily cared for by NPs had relatively low comorbidity index scores. Appropriately, the comorbidity index of those patients with shared care by NPs and FPs gradually rose over time to approximate the patient scores of those seen primarily by FPs. Comparable comorbidity findings of older adults are reported in the U.S. In a longitudinal study of Medicare data from 2007 to 2010, diabetic patients receiving care from NPs had a significantly lower Elixhauser Comorbidity Index ($p < 0.0001$) than those cared for by generalist physicians.⁴² Similarly, in a cross-sectional study of Medicare data from 2008, patients cared for by NPs had a slightly lower Elixhauser score ($p < 0.05$) than patients cared for by physicians.²² Finally, our findings parallel chronic disease comorbidity gradients found in the

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3 Ontario NPAR data with reported highest comorbidities among patients in the FP group,
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5 intermediate for shared practice and lowest amongst patients receiving care predominately from
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7 NPs.³⁴
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10 NP encounters consistently were highest in the remote, northeast region of Ontario over
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12 the 15 years. The geographical variation found in the distribution of care for older adults among
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14 provider groups corresponds to that of other Ontario investigations.^{31, 45-46} NPs were introduced
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16 into the Canadian healthcare system to address lack of access to services, often in underserved
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18 populations.⁴⁷ While the findings support that NPs are providing valuable services to older adults
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20 in more rural and remote areas of the province, the geographical variation raises ongoing
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22 concerns about equity and access to care.^{46,48}
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26 Caveats regarding the limitations of the study are critical to acknowledge. Patient
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28 encounters that did not involve a prescription were not captured, as NP encounter data is not
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30 routinely collected in Ontario health administrative data. Using the first prescription of a study
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32 year to identify a patient encounter may have introduced bias. We sought to overcome this by
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34 tallying each patient's encounters per study year and then determining the proportion of care
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36 provided by either a FP or NP. While we could not determine whether a NP was working in
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38 primary care or other settings, the likelihood that patient comorbidity data was skewed is
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40 unlikely, as the vast majority of NPs in Ontario work in primary care settings and outpatient
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42 prescription data was used.
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46 The NP role within primary healthcare teams has occurred in response to provincial
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48 support and educational investment. Yet, questions remain about the overall dispersion and
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50 impact of NPs within Ontario's healthcare system. Others have highlighted that full contribution
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52 to primary care by NPs may be lacking due to misunderstanding of the role or diminished
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3 organizational support.^{34,49} Ascertaining the right mix of providers and successful models of care
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5 that fully utilize all team members to provide complementary, comprehensive services, without
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7 duplication, has yet to be determined. Our ability to determine the impact of NPs and other
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9 health care professionals within the team is limited due to the lack of encounter data. Going
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11 forward, imputing accurate patient-level encounter codes for all healthcare providers through
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13 electronic medical records (EMRs) would assist in quantifying the effect of NP care³⁴ and
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15 provincial administrative databases require better provider indicators to overcome issues of
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17 “shadow billing” by NPs that obscure practice activities.^{34,42-43,49} In conclusion, our findings
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19 describe a population profile of patients 65 and older in Ontario receiving care from NPs. This
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21 knowledge provides further evidence for the planning of primary care services and the
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23 optimization of health professional roles within different models of care.
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42
43

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SOCIODEMOGRAPHIC PROFILE OF OLDER ADULTS

Table 1. Number of nurse practitioners (NPs) and family physicians (FPs) who prescribed to older adults in Ontario between 2000 and 2015

Year	Number of NPs	Number of patients seen by NPs	Patients/NP ratio	Number of FPs	Number of patients seen by FPs	Patients/FP ratio
2000	340	240	0.7	10201	1222981	119.9
2001	389	666	1.7	10284	1246747	121.2
2002	429	913	2.1	10319	1269956	123.1
2003	516	894	1.7	10511	1297025	123.4
2004	572	1067	1.9	10614	1352342	127.4
2005	626	2304	3.7	10764	1401119	130.2
2006	701	3741	5.3	10818	1444228	133.5
2007	862	6464	7.5	10964	1489519	135.9
2008	1023	12362	12.1	11055	1536712	139.0
2009	1259	17988	14.3	11379	1584402	139.2
2010	1432	25563	17.9	11604	1631998	140.6
2011	1651	36751	22.3	11920	1694902	142.2
2012	1934	59940	31.0	12244	1780277	145.4
2013	2151	80450	37.4	12603	1866449	148.1
2014	2438	97549	40.0	13301	1930461	145.1
2015	2779	119679	43.1	13715	1991077	145.2

SOCIODEMOGRAPHIC PROFILE OF OLDER ADULTS

Table 2. Characteristics of older patients by predominant provider group in 2005, 2010 and 2015

	2005			2010			2015		
# of Patients	NP N=155	FP N=1,400,846	Shared N=262	NP N=3,849	FP N=1,624,783	Shared N=5,611	NP N=25,220	FP N=1,952,904	Shared N=28,428
Age, years									
65-69	47 (30.3%)	403,744 (28.8%)	91 (34.7%)	1,566 (40.7%)	493,855 (30.4%)	1,975 (35.2%)	10,153 (40.3%)	650,183 (33.3%)	9,009 (31.7%)
70-74	30 (19.4%)	337,404 (24.1%)	48 (18.3%)	938 (24.4%)	365,745 (22.5%)	1,218 (21.7%)	6,048 (24.0%)	436,491 (22.4%)	6,081 (21.4%)
75-79	27 (17.4%)	289,357 (20.7%)	51 (19.5%)	641 (16.7%)	312,661 (19.2%)	1,036 (18.5%)	3,919 (15.5%)	341,012 (17.5%)	4,682 (16.5%)
80-84	30 (19.4%)	213,387 (15.2%)	42 (16.0%)	410 (10.7%)	238,200 (14.7%)	731 (13.0%)	2,643 (10.5%)	260,649 (13.3%)	3,957 (13.9%)
85+	21 (13.5%)	156,954 (11.2%)	30 (11.5%)	294 (7.6%)	214,322 (13.2%)	651 (11.6%)	2,457 (9.7%)	264,569 (13.5%)	4,699 (16.5%)
Sex									
Female	94 (60.6%)	811,395 (57.9%)	174 (66.4%)	2,378 (61.8%)	920,928 (56.7%)	3,500 (62.4%)	14,941 (59.2%)	1,083,923 (55.7%)	16,944 (59.6%)
Male	61 (39.4%)	589,451 (42.1%)	88 (33.6%)	1,471 (38.2%)	703,855 (43.3%)	2,111 (37.6%)	10,278 (40.8%)	868,981 (44.5%)	11,484 (40.4%)
Neighbourhood Income Quintile									
1-Lowest	45 (29.0%)	289,167 (20.6%)	63 (24.0%)	883 (22.9%)	307,740 (18.9%)	1,382 (24.6%)	5,783 (22.9%)	347,033 (17.8%)	6,347 (22.3%)
2	19 (12.3%)	297,894 (21.3%)	67 (25.6%)	831 (21.6%)	332,835 (20.5%)	1,154 (20.6%)	5,312 (21.1%)	387,649 (19.8%)	5,595 (19.7%)
3	12 (7.7%)	272,929 (19.5%)	43 (16.4%)	725 (18.8%)	321,089 (19.8%)	992 (17.7%)	4,935 (19.6%)	387,553 (19.8%)	5,530 (19.5%)
4	52 (33.5%)	267,444 (19.1%)	38 (14.5%)	717 (18.6%)	327,659 (20.2%)	1,097 (19.6%)	4,651 (18.4%)	412,065 (21.1%)	5,459 (19.2%)
5-Highest	26 (16.8%)	269,312 (19.2%)	51 (19.5%)	646 (16.8%)	329,804 (20.3%)	944 (16.8%)	4,354 (17.3%)	411,648 (21.1%)	5,292 (18.6%)

SOCIODEMOGRAPHIC PROFILE OF OLDER ADULTS

Table 2., Cont.	2005			2010			2015		
# of Patients	NP N=155	FP N=1,400,846	Shared N=262	NP N=3,849	FP N=1,624,783	Shared N=5,611	NP N=25,220	FP N=1,952,904	Shared N=28,428
Rurality Index									
Urban (<40)	108 (69.7%)	1,196,667 (85.4%)	129 (49.2%)	2,023 (52.6%)	1,396,072 (85.9%)	3,286 (58.6%)	15,776 (62.6%)	1,689,397 (86.5%)	20,460 (72.0%)
Rural (≥40)	46 (29.7%)	203,693 (14.5%)	133 (50.8%)	1,826 (47.4%)	228,688 (14.1%)	2,325 (41.4%)	9,443 (37.4%)	263,469 (13.5%)	7,966 (28.0%)
Ontario Marginalization Index									
Mean (± SD)	3.14 (0.71)	3.22 (0.79)	3.17 (0.74)	3.12 (0.70)	3.16 (0.79)	3.15 (0.75)	3.12 (0.73)	3.11 (0.79)	3.13 (0.76)
Median (IQR)*	3 (3-4)	3 (3-4)	3 (3-4)	3 (3-4)	3 (3-4)	3 (3-4)	3 (3-4)	3 (3-4)	3 (3-4)
LHINs** (% of patients)									
1	7.1	5.8	11.8	7.8	5.6	7.5	7.6	5.4	5.8
2	37.4	8.4	11.1	13.0	8.1	11.9	11.5	7.9	10.1
3	6.5	5.0	5.7	4.8	5.0	4.8	4.6	5.1	5.9
4	7.1	12.8	9.9	5.7	12.5	9.9	6.8	12.1	12.1
5	2.6	4.1	1.1	0.5	4.7	0.6	1.0	5.3	2.3
6	0.0	6.6	0.4	0.9	6.9	1.7	1.5	7.4	3.3
7	1.3	8.4	0.8	1.0	7.8	1.0	2.2	7.5	2.6
8	0.6	11.4	3.1	1.8	11.8	2.4	2.8	12.5	3.6
9	4.5	11.9	13.4	12.3	11.9	8.6	11.8	12.0	9.6
10	5.8	5.0	8.4	12.0	4.9	13.0	9.6	4.7	10.2
11	7.7	9.0	6.5	6.2	9.3	6.6	6.4	9.6	6.0
12	3.2	3.9	4.2	4.3	4.0	4.7	6.0	4.0	7.5
13	14.2	5.8	23.3	25.6	5.4	22.7	21.3	4.9	13.6
14	1.9	2.0	0.4	4.1	1.9	4.5	6.9	1.7	7.5

*IQR = inter-quintile range

** LHINs: 1=Erie St. Clair; 2=South West; 3=Waterloo Wellington; 4=Hamilton Niagara Haldimand Brant; 5=Central West; 6=Mississauga Halton; 7=Toronto Central; 8=Central; 9=Central East; 10=South East; 11=Champlain; 12=North Simcoe Muskoka; 13=North East; 14=North West

SOCIODEMOGRAPHIC PROFILE OF OLDER ADULTS

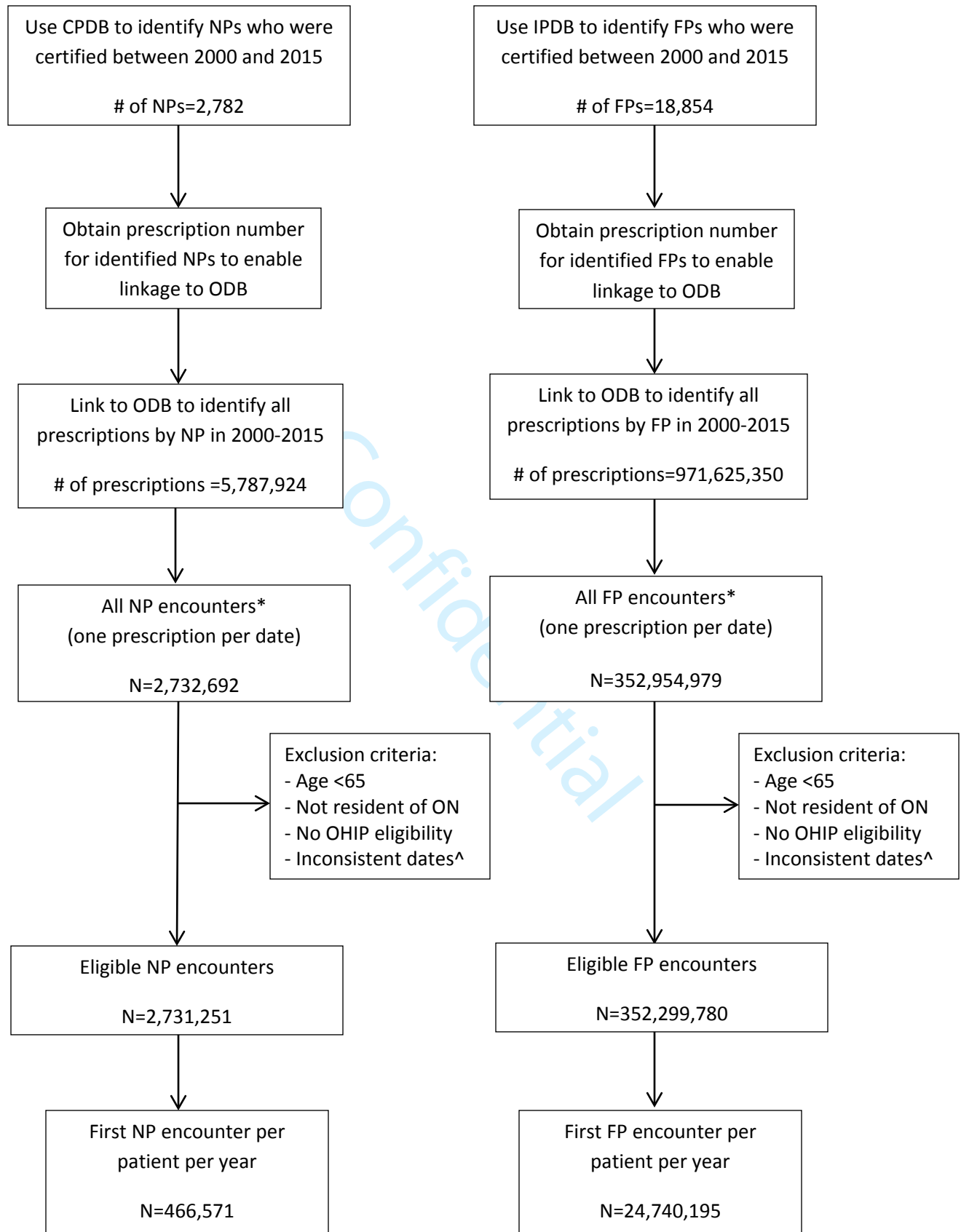


Figure 1. Flow diagram of cohort identification

*Encounter: each dispensing date is counted as one encounter (i.e. multiple prescriptions on the same date are counted as ONE encounter)

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^Inconsistent dates: death date comes before dispense date

SOCIODEMOGRAPHIC PROFILE OF OLDER ADULTS

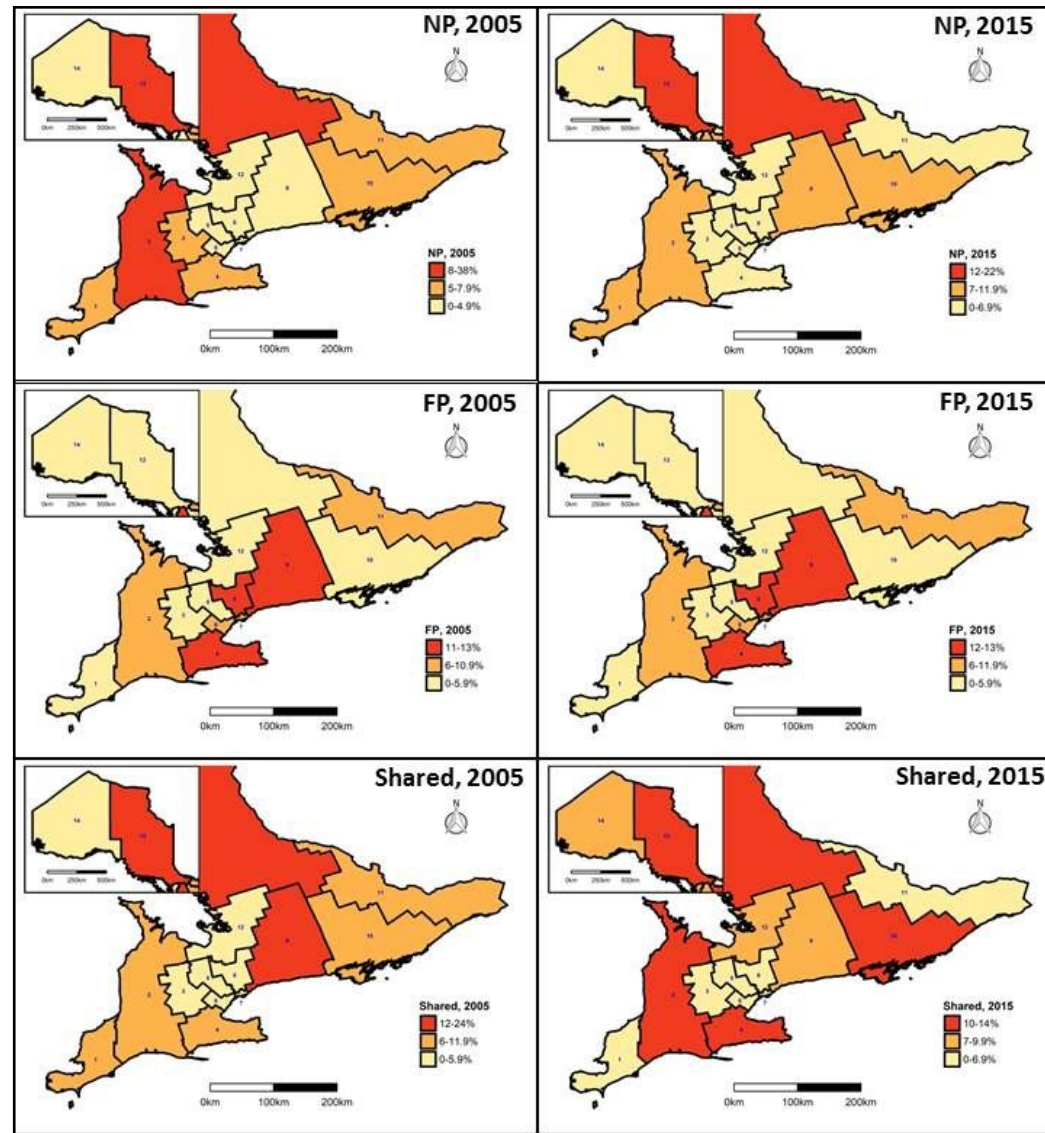


Figure 2. Proportion of older patients cared for by provider groups in 2005 and 2015 by LHIN

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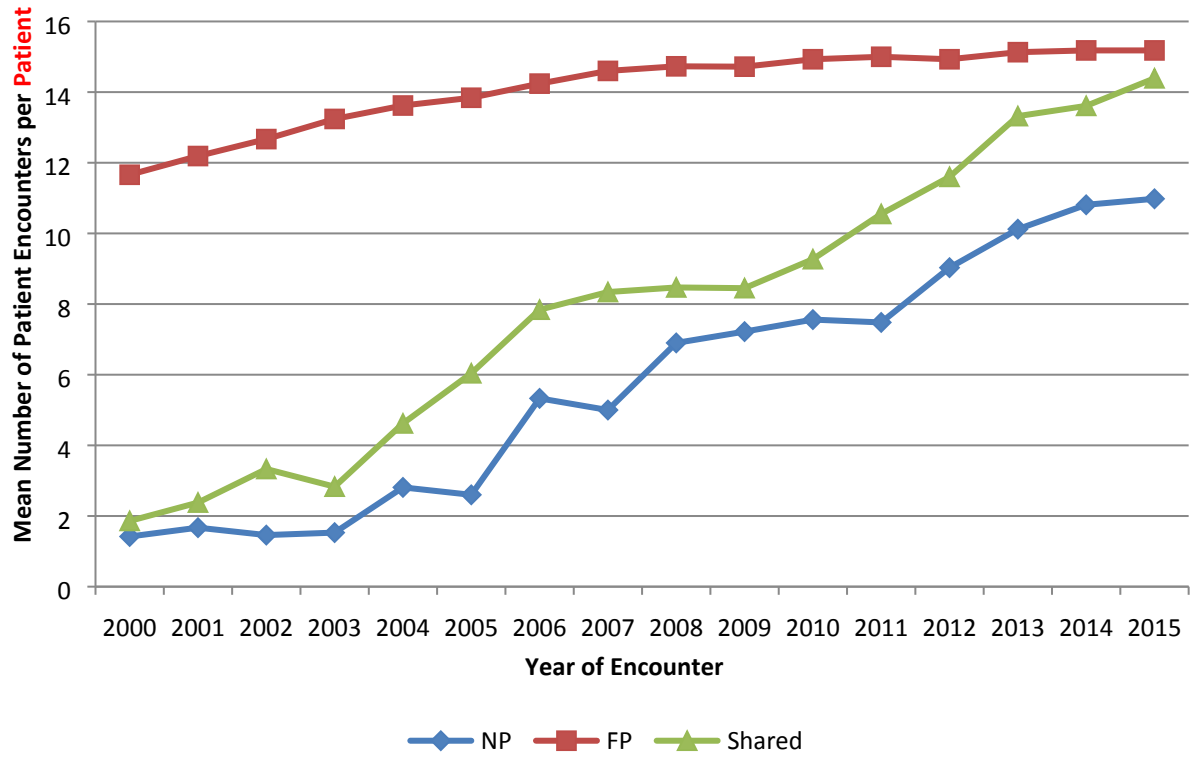


Figure 3. Mean number of patient encounters per patient per year, by provider groups, 2000-2015

SOCIODEMOGRAPHIC PROFILE OF OLDER ADULTS

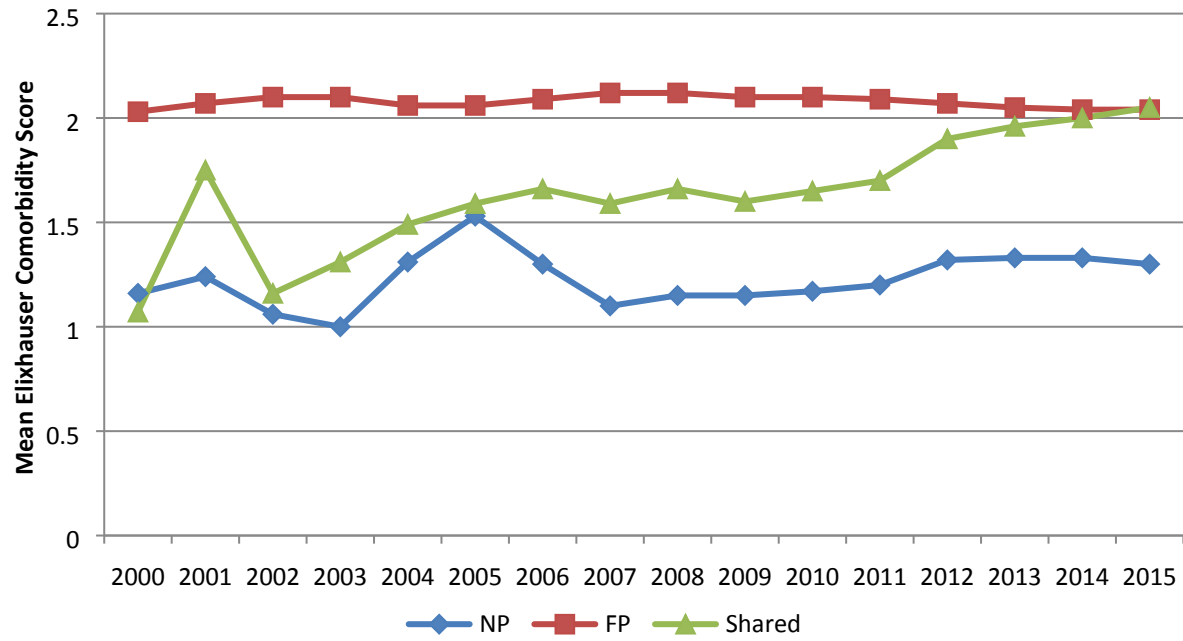


Figure 4. Mean Elixhauser Comorbidity Index score per year, by provider group, 2000-2015