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CARE FOR MUSCULOSKELETAL CONDITIONS IN ONTARIO: VISITS TO PHYSICIANS, 2006/07

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Executive Summary

Musculoskeletal conditions are a major burden on individuals, the health care system, and society at large. In order to deliver comprehensive health care for musculoskeletal conditions, including arthritis and related conditions, it is critical to understand the current volume of health care services provided to Ontarians and area variation in services across the province. This report examines the volume of health care provided to people with musculoskeletal conditions (arthritis and related conditions, bone and joint conditions, and trauma and related conditions) by physicians across Local Health Integration Networks (LHIN) in Ontario. Care for persons with musculoskeletal conditions by rehabilitation professionals in Ontario was integrated where data were available.

- Overall, 22.3% of Ontario's population saw a physician for a musculoskeletal condition in 2006/07 in ambulatory settings, and slightly more than one in ten had a visit for an arthritis and related condition. Overall 2.8 million persons made 8.7 million visits for musculoskeletal conditions in 2006/07, representing 27.3% of the total number of people with physician visits. The majority of these visits were to primary care physicians, with more than 78% of those with arthritis visits seeing a primary care physician at least once, 88% of those with bone and joint conditions and 78% of those with trauma and related conditions. These findings highlight the central role of Ontario's primary care physicians in the management of musculoskeletal conditions including arthritis and related conditions.

- Overall, 33.0% of people with a physician visit for all musculoskeletal conditions saw a specialist: 35.1% of people with arthritis and related conditions, 19.3% of those with bone and joint conditions, and 28.9% of those with trauma and related conditions. Among specialists, orthopaedic surgeons were the most frequently seen, followed by rheumatologists. There was significant regional variation in arthritis specialist care, with differences greater than two-fold for rheumatology and orthopaedic surgeons.

- There appeared to be a trade-off in the LHINs between seeing a medical and surgical specialist for arthritis and related conditions, particularly for osteoarthritis.

- In hospital settings, person visit rates for musculoskeletal conditions were highest in the emergency department (3,202.3 per 100,000 population) followed by same day surgeries (443.9 per 100,000 population) and inpatient hospitalizations (390.8 per 100,000 population).

- There was considerable area variation in the rate of emergency department visits across the province. Northern LHINs had higher rates of emergency department visits. There was an inverse relationship between the person-visit rates in ambulatory and emergency department settings; LHINs with higher ambulatory visit rates tended to have lower emergency department visit rates for the three major diagnostic groups studied.

- The findings clearly show that care for musculoskeletal conditions place a significant burden on Ontario's health care system, and that access to care for these disorders varies by LHIN. As the baby boom generation ages and the number of persons affected by these conditions increases, there will be an escalating demand for care. Service providers will have to plan carefully to ensure that those affected have access to the primary and specialist care they require, and that there is equity in access across the province.

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1.0 Introduction

Musculoskeletal conditions are a major burden on individuals, the health care system, and society at large. There are more than 150 different kinds of musculoskeletal conditions of which arthritis and related conditions are among the most common[1;2]. Musculoskeletal conditions are the most prevalent type of chronic condition in developed countries affecting 20% to 40% of the adult population, with the majority of symptoms lasting more than a year[1]. The prevalence of musculoskeletal disorders is projected to increase with the aging of the baby boomer population and an increase in life expectancy[1;3]. Perrucio et al.[4] estimate that the prevalence of arthritis in Canada will be greater than previously estimated affecting between 21% to 26% of the population; other studies show that arthritis ranks second as the most common reason for consulting a health care professional in North America[1;5-7]. Musculoskeletal disorders are also the second most costly group of diseases (after cardiovascular disease) with a high proportion of direct (health services and drug utilization) and indirect (lost productivity and disability) costs[8;9]. For arthritis and related conditions, an average patient has 78% higher health care utilization costs compared to groups of adults without arthritis related conditions[8;10]. The economic burden, composed of direct costs stemming from the disorder and indirect costs such as loss of income and time off work, is estimated to be 3.4% of the total GDP in Canada[8].

Despite the prevalence and impact of musculoskeletal conditions, they generally receive inadequate attention. Although a cure does not exist for many musculoskeletal conditions[11;12], quality of life can be improved by providing timely and effective health services that help manage symptoms like pain[13]. Care for musculoskeletal conditions often includes physical therapy, exercise, self management, and surgical procedures such as total joint replacement for end stage arthritis. Access to appropriate care by the right health care provider at the right time is key to successful management of musculoskeletal conditions. Research has demonstrated that most persons with musculoskeletal conditions see a primary care physician for management of their condition[14]. However, in surveys of primary care physicians, a lack of confidence in musculoskeletal assessment and management has been identified[15] suggesting that interventions are needed to address physician training and support development of models of care that ensure patients are able to access experts in musculoskeletal care when needed.

Rehabilitation professionals, such as physiotherapists and occupational therapists, also play a central role in management of persons with pain and functional limitations as a result of musculoskeletal conditions. Therapeutic and educational interventions include pain management, exercise, patient education, joint protection and use of assistive devices. Although rehabilitation services are used by persons suffering from a variety of musculoskeletal disorders, arthritis is consistently one of the leading reasons for referral to physical therapy[16;17].

Specialist care is indicated for some musculoskeletal conditions. For rheumatoid arthritis, it is generally recommended that patients see a rheumatologist for disease management. Disease Modifying Anti-rheumatic Drugs (DMARDs) have been shown to slow disease progression and patients are more likely to receive DMARDs if they see a specialist (rheumatologist or general internist)[18;19]. For end stage osteoarthritis, orthopaedic surgery has been shown to be effective at reducing pain and restoring function. However, research has demonstrated that persons often have difficulty getting access to effective care. Lack of referral to rheumatologists has been noted in various studies[18;19]. Wait times for orthopaedic procedures such as total joint replacement have also been a major concern in Canada in recent years[14;20]. It is likely that

access to care will continue to be a challenge given shortages and geographic variation in supply of health human resources.

In order to develop models of health care for musculoskeletal conditions, including arthritis and related conditions, it is critical to understand the current volume of health care services provided to Ontarians and area variation in services across the province. In previous ACREU studies, we have examined ambulatory care claims, hospitalizations and surgical procedures, and emergency department visits for arthritis and related conditions in Ontario. We found that in 2000/01, Ontarians made 2.8 million visits to primary care physicians for arthritis and related conditions, highlighting their central role in musculoskeletal management. One–third of those with physician visits saw a specialist[21]. Other ACREU research examined the totality of care by orthopaedic surgeons for all musculoskeletal conditions and demonstrated that over 80% of encounters with orthopaedic surgeons were in ambulatory care**.** The highest number of ambulatory visits were for traumatic conditions, followed by arthritis and related conditions[22]*.* However, no research to date has examined all musculoskeletal conditions, including trauma and related conditions (e.g. fractures) for all types of physician care. This research will set the scene for planning health services to meet the needs of persons with arthritis and other musculoskeletal conditions, including trauma, in Ontario.

1.1 Objectives

The purpose of this work was to examine the volume of health care provided by primary care physicians and specialists and by selected types of specialist for persons with musculoskeletal conditions including arthritis and related conditions, in Ontario. Care for persons with musculoskeletal conditions by rehabilitation professionals in Ontario was integrated where there were available data.

2.0 Methods

2.1 Data Sources

Administrative data from the Ontario Health Insurance Plan (OHIP) database, the Discharge Abstract Database (DAD), the National Ambulatory Care Reporting System (NACRS) database (including same day surgery (SDS) and emergency department visits(ED)) provided by the Canadian Institute of Health Information (CIHI) for the 2006 fiscal year (April 2006 to March 2007) were used to identify individuals visiting physicians for musculoskeletal conditions in Ontario in ambulatory and hospital settings.

Individuals with ambulatory visits were identified in the OHIP database using physician claims with feecodes with a prefix of “A” or “K”. A visit was defined as one claim per patient per diagnosis per service date. Linkage to Ontario’s Registered Persons Database (RPDB) was used to derive age and sex for each person and linkage to the ICES Physician Database (IPDB) was used to identify physician speciality for each visit.

Individuals using hospital services were obtained through CIHI databases: DAD, for hospital inpatient; NACRS, for emergency visits; and SDS, for day surgeries. These databases contain information on patient’s age, sex and diagnosis.

The classification scheme for diagnosis used in OHIP consists of 3-digit truncated codes adapted from the International Classification of Diseases – 9th Edition. The CIHI databases (DAD, NACRS, SDS) use the diagnostic codes from the International Classification of Diseases – 10th Edition. In the OHIP database, there is only one diagnosis code recorded for each visit while in CIHI databases there are up to 25 diagnosis codes in DAD and 10 diagnosis codes in SDS and NACRS. For this report we used the most responsible diagnosis when using CIHI databases. In addition, we used diagnostic groups based on the above classifications that were developed based on previous research[22-24]. A description of the conditions included in the diagnostic groups is presented in the Technical Appendix.

The major diagnostic groups used were *arthritis and related conditions* (e.g. osteoarthritis, rheumatoid arthritis, and joint derangement), *bone and joint conditions* (e.g. spine, bone) and *trauma and related conditions* (e.g. fractures/dislocations, sprains/strains).

Physician specialty was classified as the following type, *primary care physicians* and *specialists*. Specialists were further classified as medical (e.g. rheumatologists, internal medicine, physiatrists) or surgical specialists (e.g. orthopaedic surgeons, neurosurgeons, plastic surgeons).

Data pertaining to utilization of rehabilitation services were extracted from the Canadian Community Health Survey (CCHS), Cycle 3.1. The CCHS is across-sectional survey that collects information related to health status, health care utilization and health determinants for the Canadian population. The CCHS collects responses from persons aged 12 or older, living in private occupied dwellings. Excluded from the sampling frame are individuals living on First Nations Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Armed Forces, and residents of certain remote regions[25]. The proportion of the population with musculoskeletal conditions (including arthritis, back pain and fibromyalgia) having at least one visit to a speech language pathologist, audiologist or occupational therapist within the last 12 months (2003) was estimated. Also the proportion of the population having at least one visit to a physiotherapist within the last 12 months (2003) was estimated. These variables do not differentiate between consultations occurring in institutional or community settings.

2.2 Statistical Analysis

Crude and age and sex adjusted rates of ambulatory visits (person visit rates), emergency department visits, inpatient hospitalizations and same day surgeries were calculated for major musculoskeletal diagnostic groups and individual diagnoses of interest for the province and the Local Health Integration Networks (LHIN). Unless specified, person visit rates are presented as crude rates. Rates are standardized using the age and sex population for Ontario, 2006.

To examine the volume of ambulatory care by physician specialty, the proportion of individuals seeing different physician specialties was calculated by physician groups and diagnosis. The mean number of visits by physician groups and diagnosis was also determined. Data were analyzed by each of Ontario's 14 LHINs. The degree of regional variation in the proportion of persons seeing different type of physicians was determined quantitatively using the extremal quotient (ratio of the maximum value to the minimum value). All decimal places were used in the calculation of extremal quotients. Individuals consulting different type of physicians or for multiple conditions were counted for each condition and physician type.

Correlation coefficients were calculated to examine the relationship between the proportion of persons seeing different type of physicians by LHIN as well as the relationship between the rates of ambulatory visit to all physicians and the rate of emergency department visits, the rate of inpatient hospitalizations, and the rate of same day surgeries by LHIN. These analyses were conducted for selected diagnostic groups.

3.0 Results

3.1 Physician Care for Musculoskeletal Conditions

The majority of care for persons with musculoskeletal conditions is delivered in ambulatory settings. In 2006/07, over 2.8 million persons in Ontario made ambulatory visits to physicians for musculoskeletal conditions. This represents 27.3% of the 10.4 million Ontarians who made ambulatory visits to physicians for all conditions and 22.3% of the Ontario population overall. Musculoskeletal conditions were a relatively smaller proportion of the total number of persons who had an emergency department visit, had a same day surgery, or were hospitalized compared to ambulatory visits (Figure 1). There was variation in the most common type of musculoskeletal diagnosis across service settings. Of all people in Ontario who received inpatient care or same day surgery, the most common musculoskeletal diagnostic group was arthritis and related conditions (4.1% and 3.9% respectively of the population) while in ambulatory care and emergency departments bone and joint conditions were more common (16.7% and 3.9% of the population respectively).

Table 1 presents the number of persons with visits to all physicians by service setting and specific diagnosis. In ambulatory care, people visiting physicians with a diagnosis of sprains/strains (excluding the spine) were common as were spinal disorders. Among arthritis and related conditions, osteoarthritis was the most common diagnosis. Persons with visits to the emergency department more commonly had a diagnosis of spinal disorder, sprain/strain or fracture/dislocation. Persons making visits to the emergency department for unspecified soft tissue disorders were also relatively common. Osteoarthritis was the most common diagnosis for persons with inpatient hospitalizations while joint derangement was common for same day surgeries.

Figure 1: Proportion of persons with visits to all physicians by diagnostic groups and service setting, Ontario, 2006/07

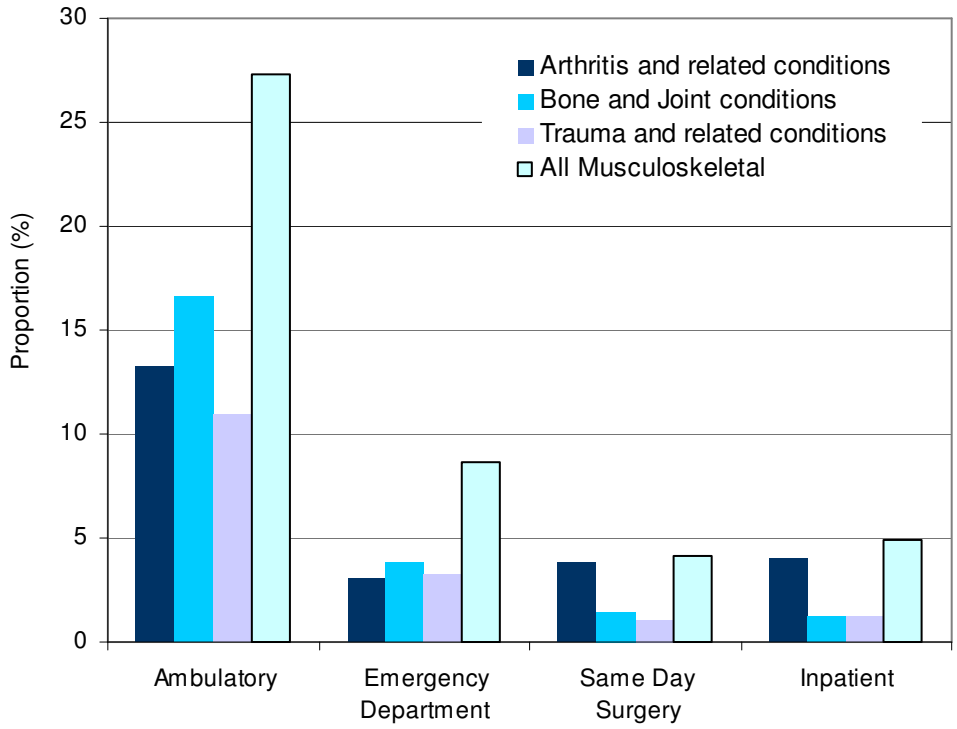


Table 1: Number and percent distribution of persons with visits for musculoskeletal conditions to all physicians by service setting, Ontario, 2006/07

	Ambulatory		Emergency Department		Inpatient Hospitalizations		Same Day Surgeries	
	Number	Percent*	Number	Percent	Number	Percent*	Number	Percent*
Rheumatoid arthritis	82,466	2.9	1,101	0.3	833	1.5	381	0.8
Ankylosing spondylitis	10,832	0.4	780	0.2	211	0.4	14	0.0
Connective tissue	24,270	0.9	1,063	0.3	976	1.7	232	0.5
Osteoarthritis	548,429	19.4	9,998	2.5	29,271	52.1	7,176	14.5
Joint derangement	137,936	4.9	3,525	0.9	1,866	3.3	22,758	46.0
Synovitis	393,607	13.9	16,923	4.2	616	1.1	7,164	14.5
Traumatic arthritis	13,942	0.5	687	0.2	635	1.1	86	0.2
Gout	54,202	1.9	8,767	2.2	505	0.9	153	0.3
Unspecified soft tissue disorders	77,818	2.8	74,462	18.4	573	1.0	765	1.5
Other arthritis	276,366	9.8	25,849	6.4	5,171	9.2	7,359	14.9
Arthritis and related	**1,363,574**	**48.3**	**143,155**	**35.3**	**40,474**	**72.0**	**45,664**	**92.3**
Spine	594,989	21.1	119,230	29.4	6,265	11.2	5,426	11.0
Bone	399,446	14.1	8,142	2.0	0	0.0	0	0.0
Other bone and joint	898,389	31.8	61,319	15.1	6,634	11.8	11,850	24.0
Bone and Joint	**1,704,292**	**60.3**	**188,691**	**46.6**	**12,867**	**22.9**	**17,156**	**34.7**
Fractures/dislocations	219,310	7.8	72,666	17.9	9,015	16.0	2,665	5.4
Strains/sprains of spine	254,474	9.0	8,433	2.1	47	0.1	6	0.0
Other strains/sprains	750,725	26.6	86,614	21.4	495	0.9	1,130	2.3
Trauma and related	**1,133,936**	**40.1**	**153,593**	**37.9**	**12,172**	**21.7**	**12,272**	**24.8**
All musculoskeletal Conditions	**2,824,654**	**100.0**	**405,310**	**100.0**	**56,186**	**100.0**	**49,464**	**100.0**

Data source: OHIP, DAD, NACRS

* Numbers in columns and/or rows do not add up to total since persons may visit for more than one condition and more than one setting

3.2 Volume of Ambulatory Care for Musculoskeletal Conditions in Ontario

Out of every 1,000 Ontarians, 223.2 made at least one visit to a physician for a musculoskeletal condition in 2006/07. The person visit rate varied by diagnostic group from 107.7 per 1,000 population for arthritis and related conditions, to 134.7 per 1,000 population for bone and joint conditions and 89.6 per 1,000 population for trauma and related conditions (Table 2). The bone and joint conditions group include a high proportion of visits for ill-defined and not specified musculoskeletal conditions. Among arthritis and related conditions, the person visit rate was highest for osteoarthritis (43.3 per 1,000 population) and synovitis (31.1 per 1,000 population). Among trauma and related conditions, the most common reason for making at least one visit to a physician was other sprains and strains (59.3 per 1,000 population).

Generally, person visit rates increased with age for all diagnostic groups. Rates were higher in women than men for arthritis and related conditions (1.4 times as many women making visits as men) and bone and joint conditions (1.3 times as many women making visits as men). Person visit rates were slightly higher for women than men for trauma and related conditions (1.1 times as many women making visits as men).

The total number of visits to all physicians for musculoskeletal conditions was 8.7 million, a mean of 3.1 visits per person. Of those, 2.9 million visits were for arthritis and related conditions. The mean number of visits for all arthritis and related conditions as well as bone and joint conditions was 2.1 visits per person while the average was 2.0 visits per person for trauma and related conditions. The mean number of visits was highest for inflammatory arthritis, particularly rheumatoid arthritis (2.7 visits per person) and connective tissues disorders (2.2 visits per person). The mean number of visits was also high for fractures and dislocations at 2.2 visits per person.

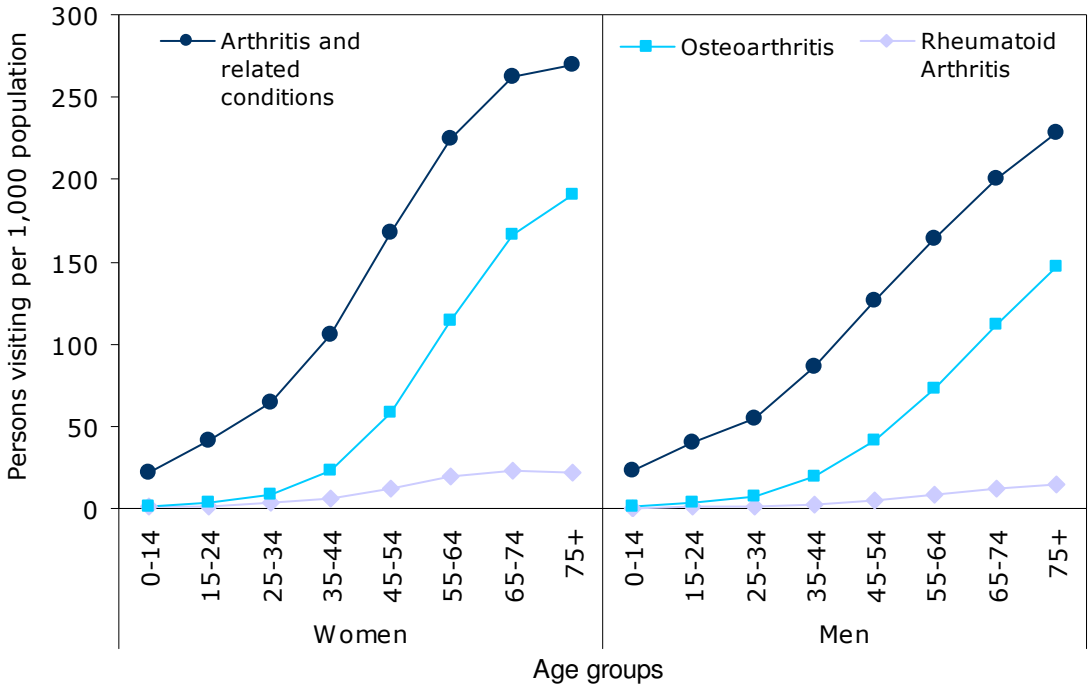
Table 2: Physicians visits for musculoskeletal conditions in ambulatory care, Ontario, 2006/07: persons visiting per 1,000 population by age and sex, female/male ratio, total number of visits and mean number of visits per person

Condition groups	Persons visiting per 1,000 population							Ratio: Women/Men	Number of visits (thousands)	Mean # of visits per person
	Age groups					Sex				
	All ages	0-14	15-44	45-64	65+	Women	Men			
Rheumatoid arthritis	6.5	0.8	2.7	10.7	18.5	8.9	4.0	2.3	219	2.7
Ankylosing spondylitis	0.9	0.0	0.8	1.4	1.1	0.8	0.9	0.9	19	1.8
Connective Tissue	1.9	0.2	1.3	3.0	4.3	3.0	0.8	3.8	54	2.2
Osteoarthritis	43.3	1.1	11.5	68.0	156.0	52.3	33.4	1.6	1,063	1.9
Joint derangement	10.9	2.0	9.6	16.9	15.2	10.7	11.1	1.0	221	1.6
Synovitis	31.1	6.8	25.4	50.4	45.1	34.5	27.6	1.3	577	1.5
Traumatic arthritis	1.1	0.2	0.7	1.7	2.3	1.2	1.0	1.2	22	1.6
Gout	4.3	0.1	1.9	7.2	12.1	1.9	6.8	0.3	81	1.5
Unspecified soft tissue disorders	6.1	0.9	4.8	10.6	9.0	8.0	4.2	2.0	136	1.7
Other arthritis	21.8	10.3	17.3	32.4	31.7	25.2	18.4	1.4	463	1.7
Arthritis and related conditions	**107.7**	**21.9**	**67.3**	**167.0**	**242.5**	**122.3**	**92.7**	**1.4**	**2,856**	**2.1**
Spine	47.0	5.6	42.0	70.6	73.3	49.9	44.0	1.2	1,113	1.9
Bone	31.6	17.7	16.7	41.7	80.2	42.3	20.5	2.1	689	1.7
Other bone and joint	71.0	27.6	61.4	98.8	106.9	78.6	63.1	1.3	1,752	2.0
Bone and joint	**134.7**	**49.5**	**110.2**	**187.3**	**228.1**	**152.6**	**116.3**	**1.3**	**3,555**	**2.1**
Fractures/dislocations	17.3	20.4	14.1	15.5	27.5	16.5	18.2	0.9	491	2.2
Strains/sprains of spine	20.1	3.7	20.9	28.9	22.2	22.6	17.5	1.3	450	1.8
Other Strains/sprains	59.3	31.6	57.2	76.6	69.8	60.1	58.5	1.1	1,306	1.7
Trauma and related conditions	**89.6**	**53.5**	**85.8**	**110.9**	**109.1**	**91.8**	**87.3**	**1.1**	**2,247**	**2.0**
All musculoskeletal conditions	**223.2**	**93.0**	**179.2**	**305.5**	**384.3**	**244.4**	**201.3**	**1.2**	**8,658**	**3.1**

Data source: OHIP, RPDB

Figure 2 presents the number of men and women per 100,000 population (i.e. the person visit rate) visiting physicians for arthritis and related conditions, osteoarthritis and rheumatoid arthritis. For all arthritis and related conditions, and osteoarthritis and rheumatoid arthritis specifically, the person visit rates were higher for women than men in all age groups over age 15 years. Rates for osteoarthritis increased consistently with age for women and men. A similar pattern was seen in rheumatoid arthritis, except in women in the oldest age group (75 years and over) where the rate slightly decreased.

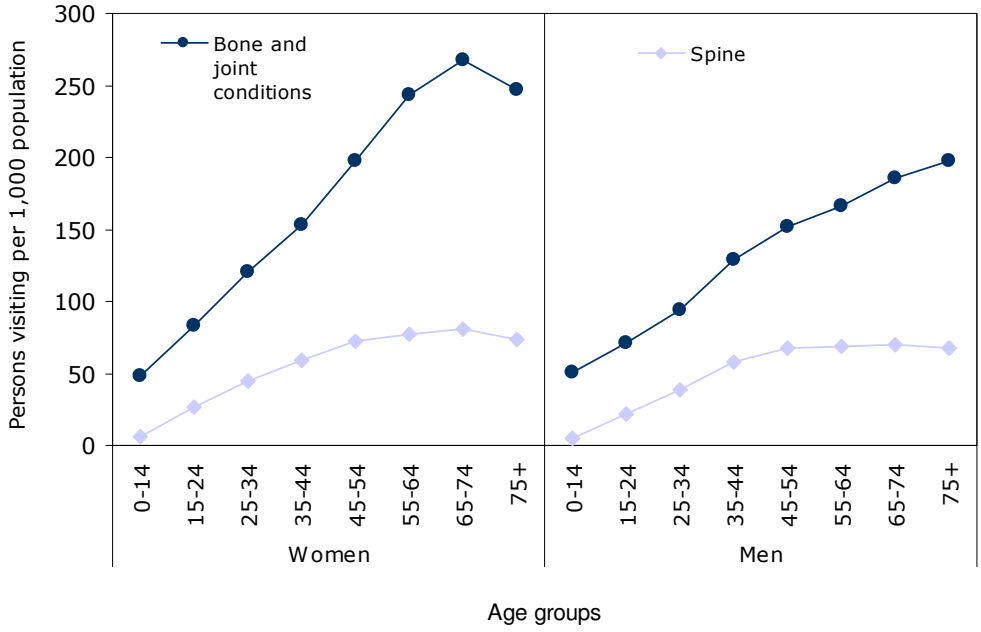
Figure 2: Number of men and women per 1,000 population visiting all physicians for arthritis and related condition, for osteoarthritis, and rheumatoid arthritis, Ontario, 2006/07



Data source: OHIP, RPDB

For bone and joint conditions, the person visit rate was higher in women than men in all age groups (Figure 3). The rate increased with age in both men and women, except in the 75 years and older age group for women, in which the rate decreased. For disorders of the spine, the rate increased with age in women until the oldest age group but remained stable in men aged 45 years and over.

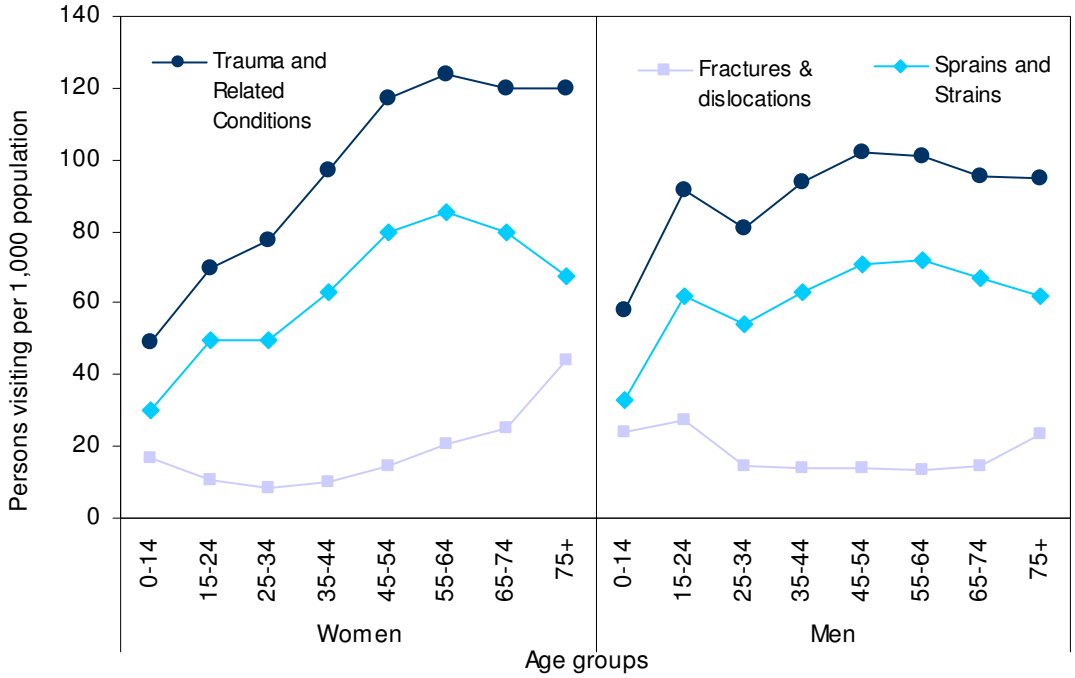
Figure 3: Number of men and women per 1,000 population visiting all physicians for bone and joint conditions and for spine disorders, Ontario, 2006/07



Data source: OHIP, RPDB

The person visit rate for trauma and related conditions was more variable (Figure 4). Overall, the rate was higher in younger men (aged 0-34 years) than women of the same age group but higher in women than men aged 35 years and over. The rate increased with age in women until age 55-64 after which the rate stabilized. However, in men the rate increased sharply in the 15-24 year age group before dropping in the 25-34 year age group and rising again until the 45-54 year age group. The rate for men decreased slightly in the older age groups. In both men and women, the rates of fractures and dislocations were higher in the younger and older age groups. Rates for men and women with sprains and strains both peaked in the 45-64 year age groups before decreasing in older age groups.

Figure 4: Number of men and women per 1,000 population visiting all physicians for trauma and related conditions, sprains and strains and fractures and dislocations, Ontario, 2006/07



Data source: OHIP, RPDB

Table 3 describes the distribution of persons with visits for musculoskeletal conditions by type of physician consulted. Overall, 78.0% of persons with visits for arthritis and related conditions saw a primary care physician at least once; the rate was similar for trauma and related conditions (78.2%). The proportion was even higher for persons with visits for bone and joint conditions (87.7%). A higher proportion of persons with a visit for arthritis and related conditions saw a specialist (35.1%) compared to the other diagnostic groups. Persons with bone and joint conditions were least likely to consult a specialist (19.3%). For example, while almost 90% of persons with disorders of the spine saw a primary care physician, a relatively low proportion saw a specialist (15.9%). This suggests that conditions such as low back pain are managed mainly by primary care physicians.

A higher proportion of persons with arthritis and related conditions saw a surgical specialist (20.5%) compared to a medical specialist (17.2%). Conversely, a greater proportion of persons with bone and joint conditions saw medical specialists, especially for bone disorders (likely related to the management of osteoporosis). As might be expected, a greater proportion of persons seeing physicians with trauma and related conditions saw more surgical specialists than medical specialists (24.5% and 4.9% respectively).

Overall, orthopaedic surgeons were the most commonly consulted specialist, particularly for fractures and dislocations and joint derangement (58.1% of persons with an ambulatory physician visit for fractures and dislocations saw an orthopaedic surgeon and 45.9% for joint derangement). However, almost 10% of persons with physician visits for fractures and dislocations saw a plastic surgeon. Almost 20% of persons with physician visits for osteoarthritis saw an orthopaedic surgeon during this period, making them the most commonly visited specialist for this condition. Overall, 17.2% of ambulatory visits for arthritis and related conditions were to medical specialists: 9.9% to rheumatologists followed by physiatrists (2.1%) and internal medicine specialists (1.7%). Among arthritis and related conditions, persons with inflammatory arthritis visits were more likely to see a medical specialist, with 81.1% of persons with visits for connective tissue disorders seeing a medical specialist followed by ankylosing spondylitis (67.0%), and rheumatoid arthritis (53.4%).

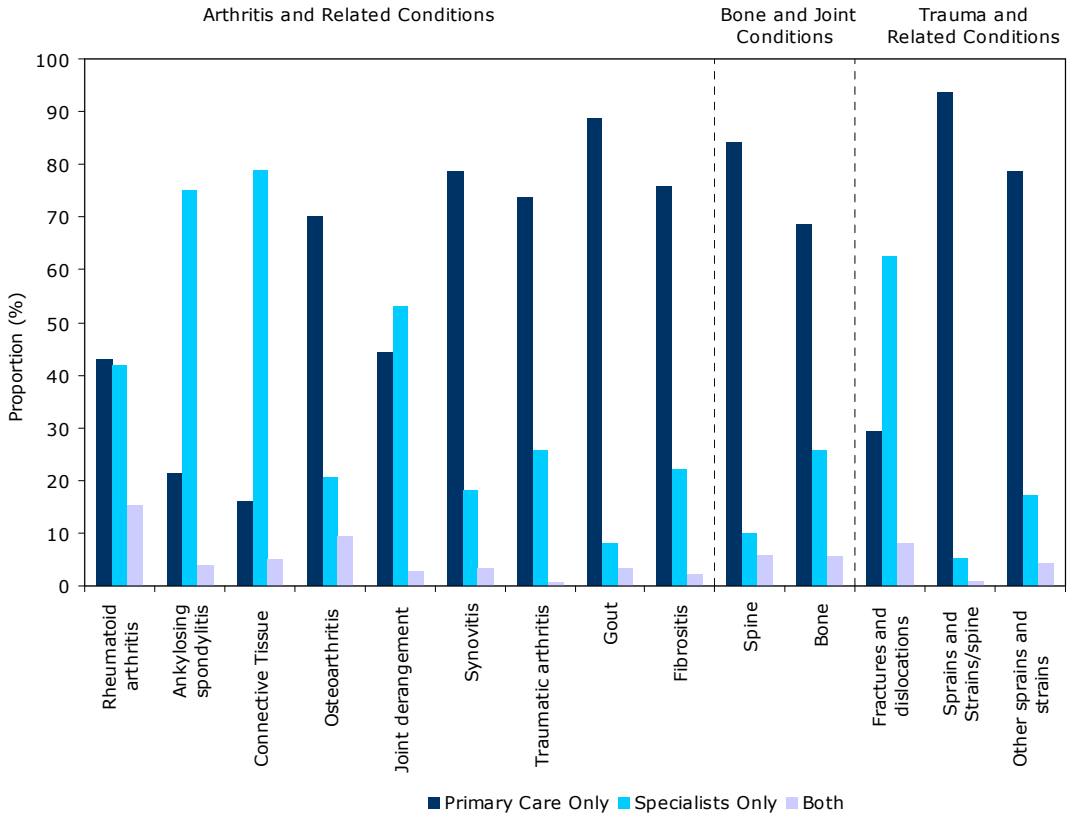
Table 3: Persons with visits for musculoskeletal conditions by type of physician consulted, Ontario, 2006/07

	All physicians	Primary Care	All specialists	Medical Specialists				Surgical Specialists			
				All	Rheuma-tologists	Internists	Physiatrists	All	Orthopaedic surgeons	Neurosurgeons	Plastic Surgeons
	(n)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Rheumatoid arthritis	82,466	58.2	57.0	53.4	46.9	4.3	0.5	6.6	3.8	<0.1	0.5
Ankylosing spondylitis	10,832	25.0	78.8	67.0	62.8	3.0	0.6	11.8	7.5	2.2	2.2
Connective Tissue	24,270	21.1	83.9	81.1	70.5	7.4	0.9	3.6	0.2	<0.1	0.6
Osteoarthritis	548,429	79.4	30.0	15.7	7.2	1.5	1.0	20.7	19.9	0.1	0.3
Joint derangement	137,936	47.1	55.6	3.7	1.1	0.3	1.0	52.1	45.9	2.1	3.5
Synovitis	393,607	82.0	21.5	7.6	4.4	1.0	1.5	14.1	8.5	<0.1	4.3
Traumatic arthritis	13,942	74.2	26.3	14.0	4.1	5.6	1.1	15.7	14.7	<0.1	0.8
Gout	54,202	91.9	11.3	10.2	7.4	2.1	<0.1	1.2	0.3	<0.1	0.2
Unspecified soft tissue disorders	77,818	78.0	24.2	21.9	14.4	1.9	3.3	2.4	1.0	<0.1	0.6
Other arthritis	276,366	66.2	37.9	22.6	4.4	1.3	5.2	17.1	8.6	0.3	6.5
Arthritis and related	**1,363,574**	**78.0**	**35.1**	**17.2**	**9.9**	**1.7**	**2.1**	**20.5**	**16.2**	**0.3**	**3.0**
Spine	594,989	89.9	15.9	9.1	1.3	1.0	2.7	7.7	5.1	1.9	<0.1
Bone	399,446	74.4	31.2	22.6	3.1	9.0	0.2	11.4	3.9	<0.1	0.2
Other bone and joint	898,389	88.9	13.9	9.1	2.2	1.0	1.4	5.0	3.7	0.2	0.2
Bone and joint	**1,704,292**	**87.7**	**19.3**	**12.8**	**2.3**	**3.0**	**1.7**	**7.8**	**4.6**	**0.8**	**0.2**
Fractures/ dislocations	219,310	37.5	70.6	2.8	0.4	0.8	0.5	69.9	58.1	0.4	9.6
Strains/ sprains of spine	249,060	94.6	6.2	5.8	0.9	2.0	2.9	3.4	1.7	0.6	<0.1
Other Strains/ sprains	750,725	82.9	21.3	4.8	<0.1	0.1	2.3	16.7	14.4	<0.1	1.6
Trauma and related	**1,133,936**	**78.2**	**28.9**	**4.9**	**0.1**	**0.7**	**2.2**	**24.5**	**20.5**	**0.2**	**2.8**
All musculoskeletal conditions	**2,824,654**	**83.2**	**33.0**	**14.4**	**5.5**	**2.5**	**2.4**	**21.5**	**16.7**	**0.6**	**2.6**

Data Sources: OHIP, RPDB

* Row proportions do not add 100% because an individual may visit more than one type of physician in a year.

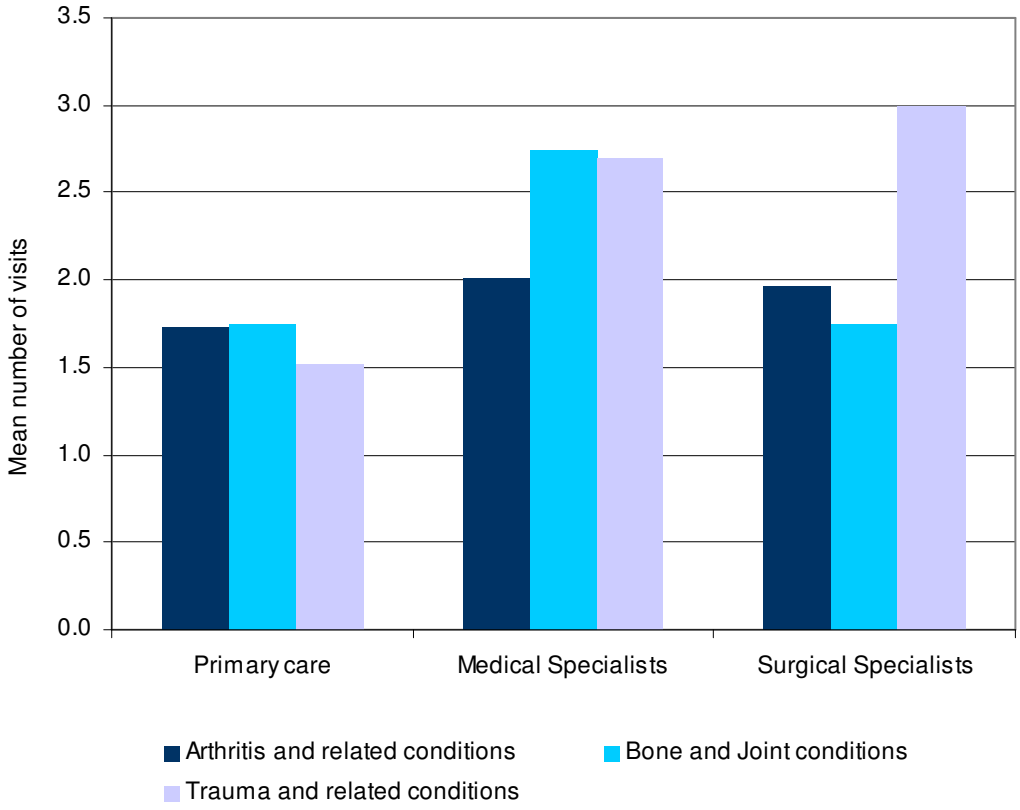
Figure 5: Proportion of persons consulting only a primary care physician, only a specialist or both by diagnosis, Ontario, 2006/07



Data Sources: OHIP, RPDB

Individuals may consult more than one type of physician for a given condition within a year. Figure 5 presents the proportion of persons with consultations to primary care physicians only, specialists only or both primary care physicians and specialists for specific diagnosis. Overall, 64.9% of persons with arthritis and related conditions consulted a primary care physician only, 22.0% a specialist only and 13.1% both primary care and a specialist. For bone and joint conditions and trauma and related conditions, the majority (80.7% and 74.4% respectively) saw a primary care physician only. The most common conditions to consult only specialists in a year were connective tissue disorders, ankylosing spondylitis, fractures/dislocations and joint derangement (a condition frequently managed by arthroscopic surgery). The proportion of persons with rheumatoid arthritis who saw primary care physicians only was similar to that for specialists only with about 15% being managed by both.

Figure 6: Mean number of visits by diagnostic groups and type of physician consulted, Ontario, 2006/07



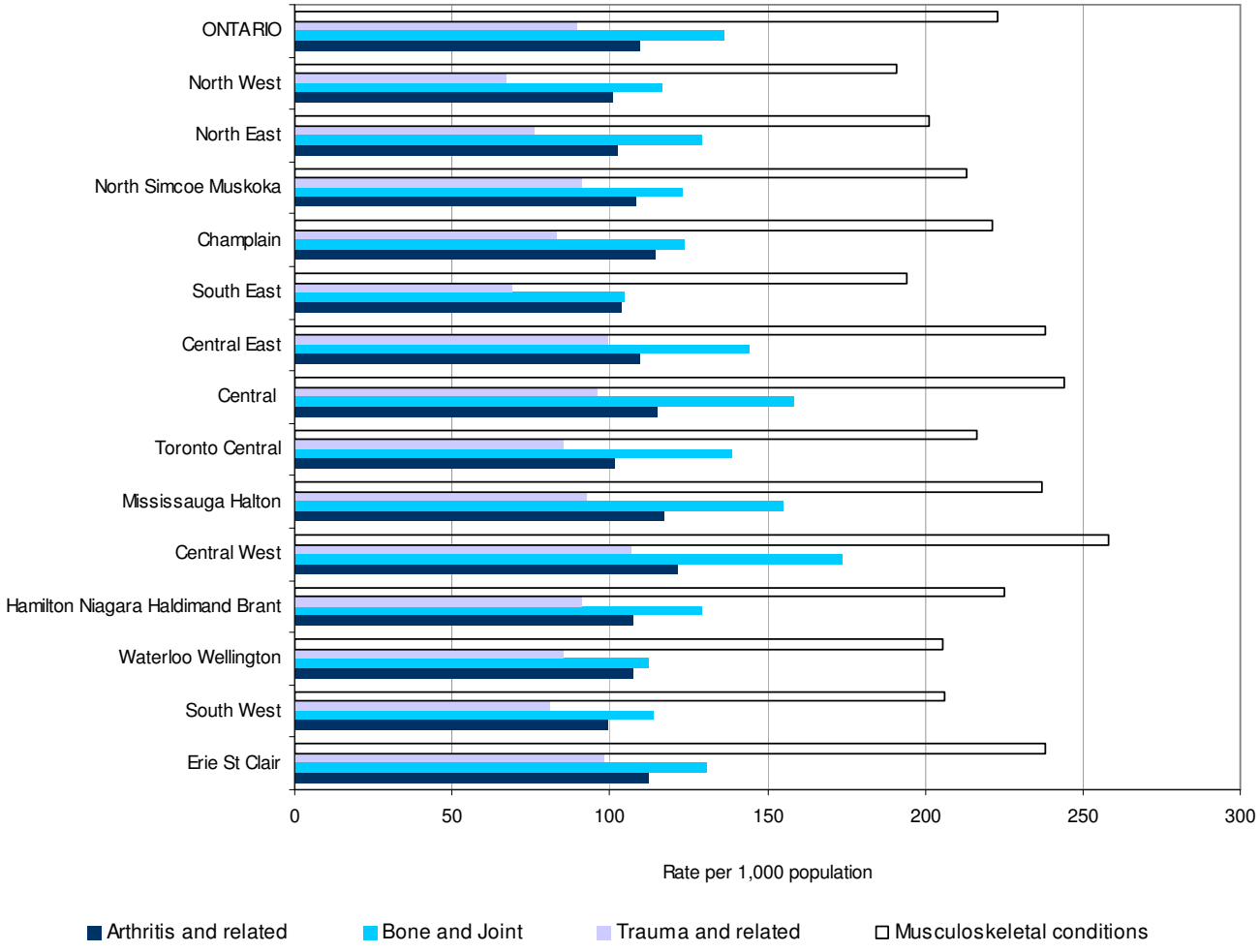
Data Sources: OHIP, RPDB

The mean number of visits varied by diagnostic groups and physician type (Figure 6). Patients with at least one visit to a physician for arthritis and related conditions made more visits per person to medical and surgical specialists than to primary care physicians. The mean number of visits for bone and joint conditions was higher for medical specialists while visits for trauma and related to conditions were higher per person to surgical specialists.

3.2.1 Geographic Variation in Ambulatory Care

Overall, rates per 1,000 population to all physicians in Ontario were 107.7 for arthritis and related conditions, 134.7 for bone and joint conditions and 89.6 for trauma and related conditions. In all LHINs, rates were lowest for arthritis and related conditions, with rates per 1,000 population ranging from 99.5 in the South West LHIN to 121.3 in the Central West LHIN. Regionally, the highest rates varied between trauma and related conditions and bone and joint conditions. Rates per 1,000 population for trauma and related conditions ranged from 67.5 in the North West LHIN to 107.1 in the Central West LHIN. Rates for bone and joint conditions were consistently highest in the LHINs in the Greater Toronto Area.

Figure 7: Age and sex adjusted person-visit rates to all physicians per 1,000 population by diagnostic groups and Local Health Integration Networks (LHIN), Ontario, 2006/07



Data Sources: OHIP, RPDB

The following tables illustrate area variation for the three major diagnostic groups: arthritis and related conditions, bone and joint conditions, and trauma and related conditions. We also present findings for osteoarthritis, a condition associated with surgical consultation and for rheumatoid arthritis, a condition for which care by medical specialists is recommended.

The majority of visits for arthritis and related conditions were to primary care physicians, with only minimal area variation across the province (Table 4). The extremal quotient (the ratio of the highest to lowest proportion) was 1.1. Variation was more pronounced for the proportion of persons visiting specialists for this condition (extremal quotient 1.4). Area variation was marked for the proportion of people seeing internal medicine specialists (extremal quotient 7.6), rheumatologists (extremal quotient 2.3) and orthopaedic surgeons (extremal quotient 2.5) for arthritis and related conditions. In general, visits to physiatrists and neurosurgeons for arthritis and related conditions were low; however, there was significant area variation (extremal quotient 11.0 and 13.7 respectively).

Overall, the majority of persons with osteoarthritis saw a primary care physician with little variation across the province (extremal quotient 1.1) (Table 5). However, variation in the proportion seeing specialists was higher (extremal quotient 1.3). Variation was much greater for medical specialists than surgical specialists, particularly internal medicine specialists (extremal quotient 15.3), rheumatologists (extremal quotient 7.9) and physiatrists (extremal quotient 57). LHINs in the Greater Toronto Area and Champlain tended to have a higher proportion of persons with osteoarthritis consulting a rheumatologist while the South West and North West LHINs had the lowest proportion. In contrast, the South West LHIN had the highest proportion of persons consulting an orthopaedic surgeon (28.1%) followed by the North West LHIN (27.5%). The lowest proportion of persons consulting orthopaedic surgeons was in the Central West LHIN (14.2%).

Specialist care is important for rheumatoid arthritis and best practice guidelines recommend that persons with rheumatoid arthritis see a rheumatologist[13]. Among persons with rheumatoid arthritis, there was provincial variation in the proportion consulting specialists (extremal quotient 1.5) with wide variation for different types of specialists: rheumatologists (extremal quotient 2.1), internal medicine specialists (extremal quotient 15.6) and physiatrists (extremal quotient 13.0) (Table 6). The lowest proportion of visits to rheumatologists was in North East LHIN (28.4%) and the highest proportion was in Champlain LHIN (59.4%). In contrast, North East LHIN had the highest proportion of persons with visits to internal medicine specialists (15.0%).

There was minimal area variation in persons with primary care physician visits for bone and joint conditions in Ontario (extremal quotient 1.1) (Table 7). However, there was regional variation in the proportion of persons seeing medical specialists (extremal quotient 2.4) and surgical specialists (extremal quotient 3.2), most notably internal medicine specialists (extremal quotient 109.6) and orthopaedic surgeons (extremal quotient 4.5). The Toronto Central LHIN had the highest proportion of persons consulting medical specialists (17.5%) while the lowest was in the North West LHIN (7.4%). In contrast, the North West LHIN had the highest proportion of persons with consultations to orthopaedic surgeons (9.9%). Central West LHIN had the lowest proportion of persons with visits to orthopaedic surgeons for bone and joint conditions.

There was a high proportion of persons who saw a primary care physician for trauma and related conditions across the province with some area variation (extremal quotient 1.4) (Table 8). There was regional variation in the proportion of persons seeing medical specialists (extremal quotient 4.9) and surgical specialists (extremal quotient 2.5), like orthopaedic surgeons (extremal quotient 2.8). Waterloo Wellington LHIN had the lowest proportion of persons consulting orthopaedic surgeons (13.9%) while the highest was in the South East LHIN (39.3%).

Table 4: Persons with visits for **arthritis and related conditions** and type of physician consulted, by Local Health Integration Networks, Ontario, 2006/07

Local Health Integration Networks (LHIN)	All physicians	Age-sex adjusted person visit rates per 1,000 population	Percent								
			Primary Care	All Specialists	Medical Specialists				Surgical Specialists		
					All	Rheuma-tologists	Internists	Physiatrists	All	Ortho-paedic surgeons	Neuro-surgeon
Erie St Clair	73,109	111.2	81.3	31.5	11.4	6.3	1.0	0.3	21.8	17.6	0.3
South West	95,043	98.8	80.2	32.7	10.3	5.4	1.7	1.3	24.2	20.3	0.2
Waterloo Wellington	62,959	92.0	75.6	37.9	18.0	9.1	1.4	0.8	23.1	17.8	0.2
Hamilton Niagara Haldimand Brant	152,640	106.4	72.9	42.1	18.2	11.0	1.0	2.5	27.5	22.4	0.3
Central West	84,561	119.6	81.3	31.0	16.8	8.7	3.5	1.7	16.3	12.8	0.3
Mississauga Halton	117,904	115.9	78.7	34.4	18.4	10.8	1.5	1.4	18.7	14.7	0.6
Toronto Central	116,230	101.1	77.8	35.0	20.5	12.7	2.2	2.3	17.2	13.5	0.2
Central	177,301	114.1	78.1	34.4	21.3	12.5	2.1	3.1	15.6	11.9	0.1
Central East	160,901	108.0	79.3	33.5	16.9	10.3	1.5	2.1	18.8	14.7	0.1
South East	54,294	103.1	78.8	34.6	12.9	7.6	1.3	3.3	23.6	19.9	0.5
Champlain	134,832	112.7	76.4	36.7	19.6	11.7	1.9	2.6	19.6	15.3	0.3
North Simcoe Muskoka	47,198	105.6	82.4	30.8	15.6	9.0	0.5	3.7	17.7	12.7	0.2
North East	60,585	99.0	79.2	33.6	12.9	6.5	2.7	1.8	23.3	15.8	1.4
North West	24,050	99.7	71.9	43.0	11.8	5.8	0.6	2.3	34.1	29.2	0.1
ONTARIO	**1,361,607**	**107.7**	**78.0**	**35.1**	**17.2**	**10.0**	**1.7**	**2.1**	**20.5**	**16.2**	**0.3**
Extremal Quotient	-	1.3	1.1	1.4	2.1	2.3	7.6	11.0	2.2	2.5	13.7

Data Sources: OHIP, RPDB

* Row proportions do not add 100% because an individual may visit more than one type of physician in a year.

Table 5: Persons with visits for **osteoarthritis** and type of physician consulted, by Local Health Integration Networks, Ontario, 2006/07

	All Physicians	Age-sex adjusted person visit rates per 1,000 population	Percent							
			Primary Care	All specialists	Medical Specialists				Surgical Specialists	
					All	Rheuma-tologists	Internists	Physiatrists	All	Orthopaedic surgeons
Erie St Clair	34,988	52.3	82.1	28.0	5.5	3.7	1.0	<0.1	23.6	21.6
South West	40,967	41.0	80.6	31.4	4.0	1.7	1.2	0.3	28.7	28.1
Waterloo Wellington	22,026	33.0	77.7	33.0	9.7	5.0	2.8	0.4	26.6	25.9
Hamilton Niagara Haldimand Brant	67,988	45.7	77.8	33.2	12.7	8.4	1.3	0.9	23.3	23.0
Central West	29,613	45.9	83.5	25.8	12.2	6.8	3.4	0.8	15.1	14.2
Mississauga Halton	42,603	44.9	79.9	30.4	15.3	9.3	1.4	2.1	17.4	16.6
Toronto Central	47,164	41.0	79.2	31.3	15.8	10.3	2.0	1.6	18.2	17.5
Central	63,474	42.5	78.5	31.5	18.2	12.7	2.0	1.7	15.7	15.1
Central East	62,414	41.7	81.8	28.2	11.8	7.5	0.9	1.0	18.4	18.0
South East	25,744	46.2	81.2	28.7	5.1	2.9	1.2	0.5	24.6	22.3
Champlain	51,359	42.0	78.1	32.2	11.8	8.9	1.1	0.7	22.0	21.0
North Simcoe Muskoka	19,626	42.7	83.1	27.2	8.7	4.6	0.4	1.0	20.7	19.9
North East	26,441	41.3	83.2	25.7	6.4	2.8	1.4	0.2	20.9	19.8
North West	9,098	37.3	77.9	31.7	7.4	1.6	0.2	0.5	28.0	27.5
ONTARIO	**543,505**	**43.3**	**80.1**	**30.2**	**11.5**	**7.3**	**1.5**	**1.0**	**20.9**	**20.0**
Extremal Quotient	-	1.6	1.1	1.3	4.6	7.9	15.3	57.0	1.9	2.0

Data Sources: OHIP, RPDB

* Row proportions do not add 100% because an individual may visit more than one type of physician in a year.

Table 6: Persons with visits for **rheumatoid arthritis** and type of physician consulted, by Local Health Integration Networks, Ontario, 2006/07

Local Health Integration Networks (LHIN)	All Physicians	Age-sex adjusted person visit rates per 1,000 population	Percent							
			Primary Care	All Specialists	Medical Specialists				Surgical Specialists	
					All	Rheuma-tologists	Internists	Physiatrists	All	Orthopaedic surgeons
Erie St Clair	4,349	6.5	65.8	47.9	44.9	39.3	2.5	0.2	5.1	3.4
South West	6,410	6.6	68.7	47.3	45.4	37.1	6.5	0.2	4.1	2.5
Waterloo Wellington	4,045	6.0	58.8	56.8	54.5	51.1	1.0	0.4	4.6	3.1
Hamilton Niagara Haldimand Brant	9,149	6.3	51.8	64.2	60.9	57.2	1.7	0.5	7.6	4.0
Central West	4,972	7.4	59.4	57.1	53.3	41.1	10.7	0.1	7.5	2.3
Mississauga Halton	7,493	7.6	53.7	58.8	46.7	41.4	2.5	0.1	15.2	12.1
Toronto Central	5,797	5.0	58.9	56.5	53.9	47.7	3.6	1.1	5.8	3.5
Central	9,307	6.1	53.5	60.5	58.6	50.5	4.8	0.7	3.4	1.7
Central East	8,753	5.9	56.8	61.1	59.5	53.5	2.9	0.8	4.2	3.0
South East	3,510	6.5	60.9	59.6	55.6	53.0	2.3	0.3	6.2	2.9
Champlain	7,321	6.1	49.2	66.7	64.0	59.4	2.8	0.3	6.5	3.7
North Simcoe Muskoka	3,873	8.5	68.8	45.7	44.0	40.9	1.3	0.5	3.2	1.0
North East	5,208	8.3	69.2	49.8	43.5	28.4	15.0	0.2	11.7	2.9
North West	1,653	6.9	70.5	52.0	48.4	43.6	2.6	1.6	6.3	5.8
ONTARIO	**81,840**	**6.5**	**58.5**	**57.4**	**53.7**	**47.2**	**4.3**	**0.5**	**6.6**	**3.8**
Extremal Quotient	-	1.7	1.4	1.5	1.5	2.1	15.6	13.0	4.8	12.7

Data Sources: OHIP, RPDB

* Row proportions do not add 100% because an individual may visit more than one type of physician in a year.

Table 7: Persons with visits for **bone and joint conditions** and type of physician consulted, by Local Health Integration Networks, Ontario, 2006/07

Local Health Integration Networks (LHIN)	All Physicians	Age-sex adjusted person visit rates per 1,000 population	Percent								
			Primary Care	All Specialists	Medical Specialists				Surgical Specialists		
					All	Rheuma-tologists	Internists	Physia-trists	All	Ortho-paedic surgeons	Neuro-surgeon
Erie St Clair	85,415	131.0	87.8	17.9	11.4	0.5	2.8	1.1	7.9	3.3	1.1
South West	107,804	114.1	85.8	20.5	12.6	1.1	4.3	1.4	9.4	6.0	0.6
Waterloo Wellington	77,471	112.0	87.0	17.7	11.0	2.0	1.9	1.1	8.0	4.5	0.5
Hamilton Niagara Haldimand Brant	181,802	129.4	85.1	21.7	14.8	4.7	1.9	2.2	8.3	5.4	0.9
Central West	127,860	173.3	90.6	13.2	9.7	2.0	2.8	0.8	4.3	2.2	0.6
Mississauga Halton	162,289	155.1	85.4	20.4	13.8	1.8	3.2	0.7	7.7	4.6	0.8
Toronto Central	161,020	139.1	83.4	23.1	17.5	3.3	0.6	1.9	7.0	3.4	0.7
Central	249,397	158.6	87.3	18.3	13.3	2.1	0.3	2.3	6.3	3.9	0.5
Central East	214,583	144.2	87.9	17.6	11.2	1.6	0.2	1.8	7.7	4.8	0.5
South East	53,099	104.6	86.9	18.3	10.4	1.0	0.3	2.0	9.6	5.8	1.0
Champlain	147,653	123.7	84.0	21.3	14.0	3.5	0.2	2.5	8.8	4.6	0.8
North Simcoe Muskoka	52,371	123.3	90.4	15.6	7.9	1.7	0.1	1.8	8.9	5.4	1.1
North East	74,571	129.3	88.9	16.8	8.4	0.9	0.2	0.2	9.6	4.9	1.6
North West	27,862	116.6	87.2	19.2	7.4	0.8	<0.1	0.6	13.7	9.9	1.1
ONTARIO	**1,723,197**	**136.1**	**86.6**	**19.1**	**12.6**	**2.2**	**1.4**	**1.6**	**7.7**	**4.5**	**0.8**
Extremal Quotient	-	1.7	1.1	1.7	2.4	9.1	109.6	10.8	3.2	4.5	3.2

Data Sources: OHIP, RPDB

* Row proportions do not add 100% because an individual may visit more than one type of physician in a year.

Table 8: Persons with visits for **trauma and related conditions** and type of physician consulted, by Local Health Integration Networks, Ontario, 2006/07

Local Health Integration Networks (LHIN)	All Physicians	Age-sex adjusted person visit rates per 1,000 population	Percent									
			Primary Care	All Specialists	Medical Specialists				Surgical Specialists			
					All	Rheuma-tologists	Internists	Physiat-rists	All	Ortho-paedic surgeon	Neuro-surgeon	Plastic surgeon
Erie St Clair	61,145	98.3	82.4	24.8	3.5	<0.1	0.3	1.6	21.8	17.5	0.5	2.2
South West	80,187	81.1	76.3	31.0	7.3	<.01	0.5	4.8	24.2	19.2	0.2	3.4
Waterloo Wellington	60,149	85.1	84.9	20.5	3.6	<0.1	0.3	2.6	17.2	13.9	0.1	2.0
Hamilton Niagara Haldimand Brant	123,141	91.1	76.3	31.7	6.1	0.3	0.5	3.2	26.2	22.7	0.1	2.8
Central West	81,523	107.1	85.5	20.8	3.4	0.1	1.1	1.2	17.8	14.7	0.2	1.5
Mississauga Halton	97,785	92.7	79.3	27.7	6.1	0.1	1.4	1.6	22.3	17.6	0.3	2.9
Toronto Central	98,441	85.1	73.2	34.5	6.3	0.1	1.4	2.4	28.8	23.9	0.2	3.8
Central	148,391	96.0	78.8	28.4	5.4	0.1	0.6	2.5	23.6	19.5	0.2	3.5
Central East	150,906	99.4	80.9	26.2	5.2	0.1	0.5	2.3	21.5	17.8	0.2	3.2
South East	35,215	69.0	60.3	46.1	4.6	0.1	0.8	1.7	42.4	39.3	0.2	1.9
Champlain	99,184	83.1	76.5	30.2	3.1	0.2	0.4	1.1	27.6	24.1	0.2	2.9
North Simcoe Muskoka	35,258	91.3	80.8	26.0	1.5	<0.1	0.1	1.2	24.8	22.4	0.2	1.4
North East	43,348	75.8	73.5	33.6	2.3	<0.1	0.3	0.9	31.6	27.1	0.3	2.6
North West	17,816	67.5	73.9	33.8	3.0	<0.1	0.1	1.4	31.1	24.0	0.9	1.9
ONTARIO	1,132,489	**89.6**	**78.2**	**28.9**	**4.9**	**0.1**	**0.7**	**2.2**	**24.5**	**20.5**	**0.2**	**2.8**
Extremal Quotient	-	1.6	1.4	2.2	4.9	116.5	19.9	5.4	2.5	2.8	9.4	2.8

Data Sources: OHIP, RPDB

* Row proportions do not add 100% because an individual may visit more than one type of physician in a year.

For some diagnostic groups, there appears to be a relationship between visits to medical and surgical specialists where LHINs with higher person visit rates to medical specialists tend to have lower person visit rates to surgical specialists. Figure 8 shows the person visit rate per 1,000 population to medical and surgical specialists across LHINs for arthritis and related conditions; as the person visit rate to medical specialists decreases, the person visit rate to surgical specialists increases. This suggests there may be a trade-off between care delivery by medical and surgical specialists. This is also true of osteoarthritis (Figure 9). Correlation coefficients show a moderate negative correlation between medical and surgical specialists for arthritis and related conditions (correlation= -0.56) and for osteoarthritis (correlation= -0.65). The pattern is similar for bone and joint conditions though less pronounced (Figure 10). For trauma and related conditions, there was very little relationship between the person visit rates to medical compared to surgical specialists (Figure 11) by LHIN. This suggests there is more to understand about the utilization of medical and surgical specialists in relation to supply of specialists by LHIN.

Figure 8: Rate of persons visiting medical and surgical specialists for arthritis and related conditions, by Local Health Integration Networks, Ontario, 2006-07

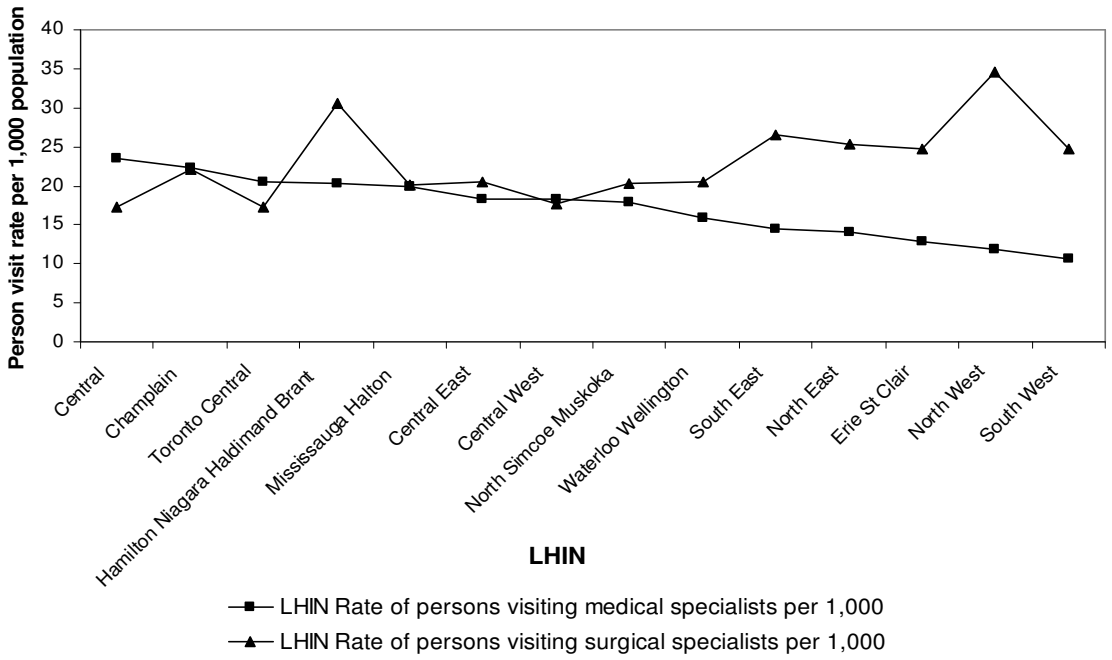
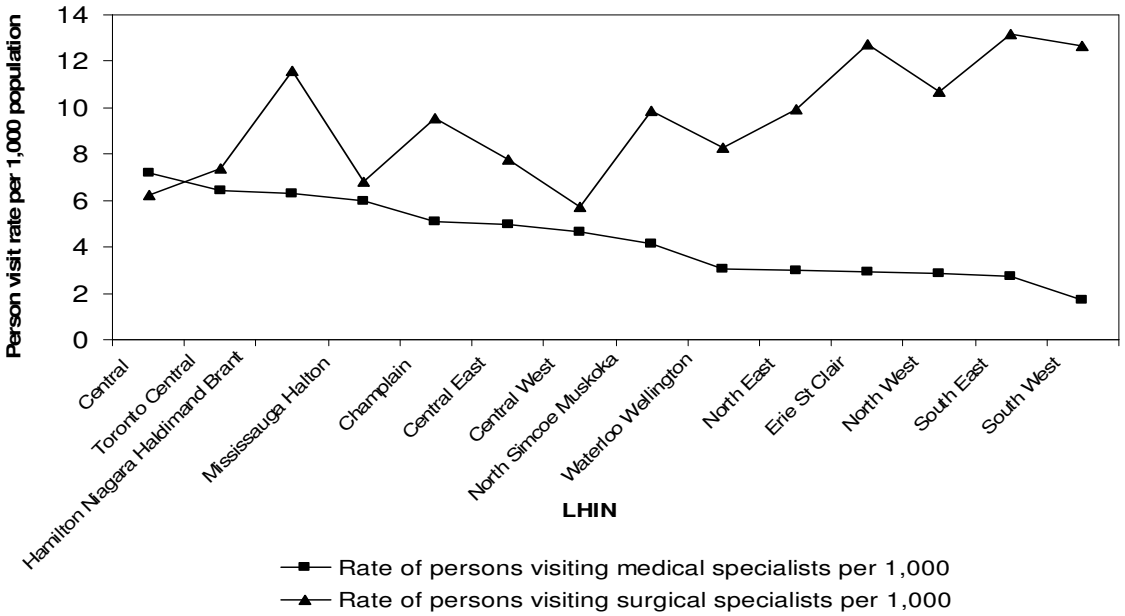


Figure 9: Rate of persons visiting medical and surgical specialists for osteoarthritis, by Local Health Integration Networks, Ontario, 2006-07



Note: The order of the LHINs were sorted based on decreasing rates of persons visiting medical specialists

Figure 10: Rate of persons visiting medical and surgical specialists for bone and joint conditions, by Local Health Integration Networks, Ontario, 2006-07

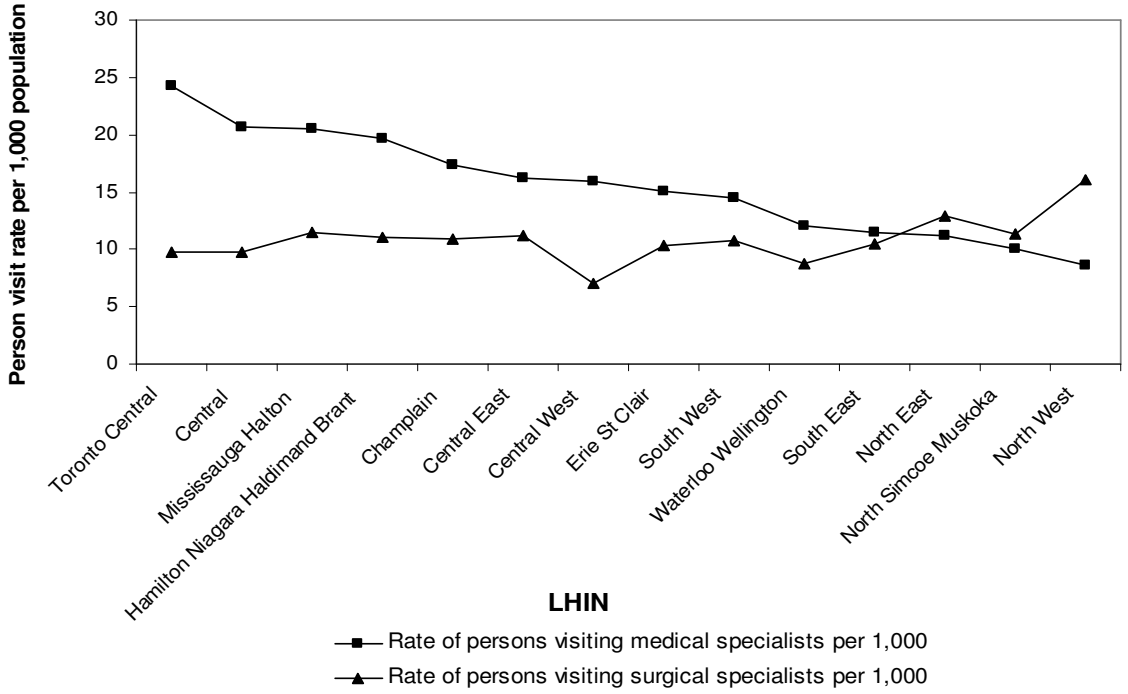
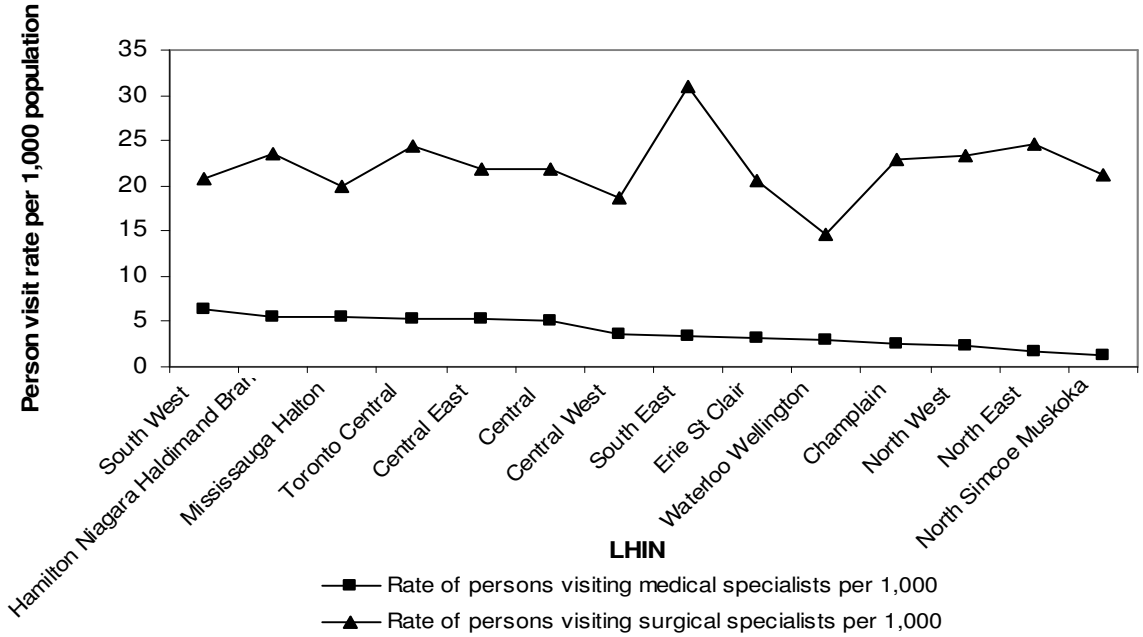


Figure 11: Rate of persons visiting medical and surgical specialists for trauma and related conditions, by Local Health Integration Networks, Ontario, 2006-07



Note: The order of the LHINs were sorted based on decreasing rates of persons visiting medical specialists

3.3 Hospital Care for Musculoskeletal Conditions

While most individuals with musculoskeletal conditions are treated in an ambulatory care setting, some will visit the emergency department for care. Others will have a same day surgery or will require admission to a hospital, with or without a surgical intervention. Overall, the person visit rate to the emergency room was higher than for hospital admission or same day surgeries (Table 9). In the emergency department, person visit rates for trauma and related conditions were highest at 1,213.5 per 100,000, with high rates for other sprains and strains, and fractures and dislocations, while the rate for arthritis and related conditions was 948.9 per 100,000. Rates per 100,000 population for disorders of the spine (772.0) and unspecified soft tissue disorders (529.0) were also high in the emergency department. Person visit rates per 100,000 population for same day surgeries and inpatient hospitalizations were higher for persons with arthritis and related conditions and least for trauma and related conditions. Osteoarthritis had the highest rate per 100,000 population for inpatient care (231.3) while joint derangements were highest in same day surgery (179.8).

Table 9: Person visit rate per 100,000 population to all physicians by hospital setting, Ontario, 2006/07

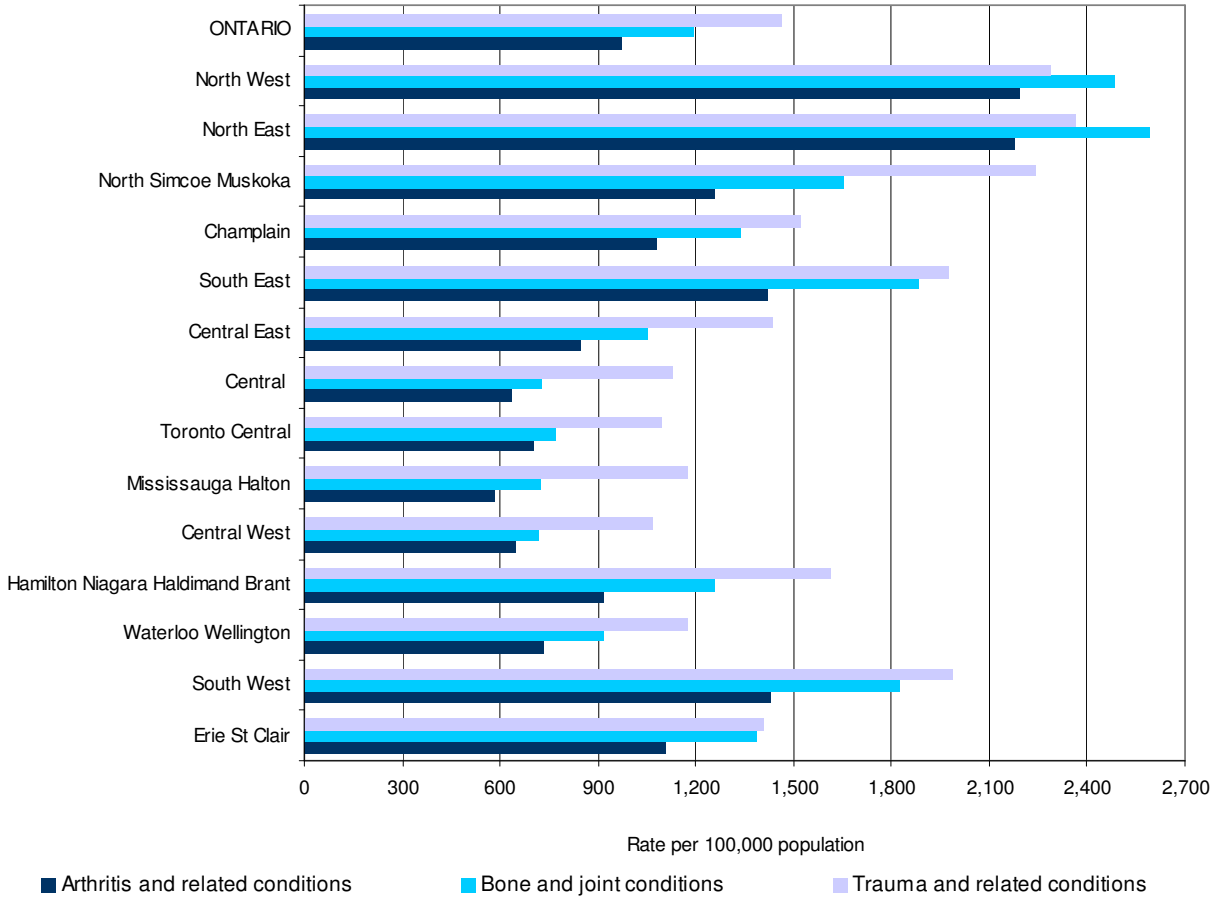
	Emergency Department	Same Day Surgery	Hospital Inpatient
Rheumatoid arthritis	7.0	3.0	6.6
Ankylosing spondylitis	5.7	0.1	1.7
Connective Tissue	7.2	1.8	7.7
Osteoarthritis	72.1	56.7	231.3
Joint derangement	24.9	179.8	14.7
Synovitis	120.8	56.6	4.9
Traumatic arthritis	4.8	0.7	5.0
Gout	59.8	1.2	4.0
Unspecified soft tissue disorders	529.0	6.0	4.5
Other arthritis	187.0	58.1	40.9
Arthritis and related conditions	**948.9**	**360.8**	**319.8**
Spine	772.0	42.9	49.5
Bone	62.3	0.0	0.0
Other bone and joint	386.0	93.6	52.4
Bone and Joint	**1,190.8**	**135.5**	**101.7**
Fractures/dislocations	515.0	21.1	71.2
Strains/sprains of spine	63.9	<0.1	0.4
Other Strains/sprains	643.2	8.9	3.9
Trauma and related conditions	**1,213.5**	**96.1**	**97.0**
All musculoskeletal conditions	**3,202.3**	**443.9**	**390.8**

Data Sources: DAD, NACRS

3.3.1 Geographic Variation in Hospital Care

There was considerable area variation in the rate of emergency department visits across the province (Figure 12). LHINs in the Greater Toronto Area tended to have lower rates for all conditions studied. Mississauga Halton LHIN had the lowest rates per 100,000 population for arthritis and related conditions (583.5) and the North West LHIN the highest rate (2,191.1). Central West LHIN had lowest rate per 100,000 population for trauma and related conditions (884.0) and bone and joint conditions (716.7) while the North East LHIN had the highest rate for trauma and related conditions (1959.5) and the North East LHIN had the highest rate for bone and joint conditions (2,590.4). While trauma and related conditions tended to have the highest rates compared to arthritis and bone and joint conditions in most LHINs, rates for bone and joint conditions were higher in the North East and North West LHINs.

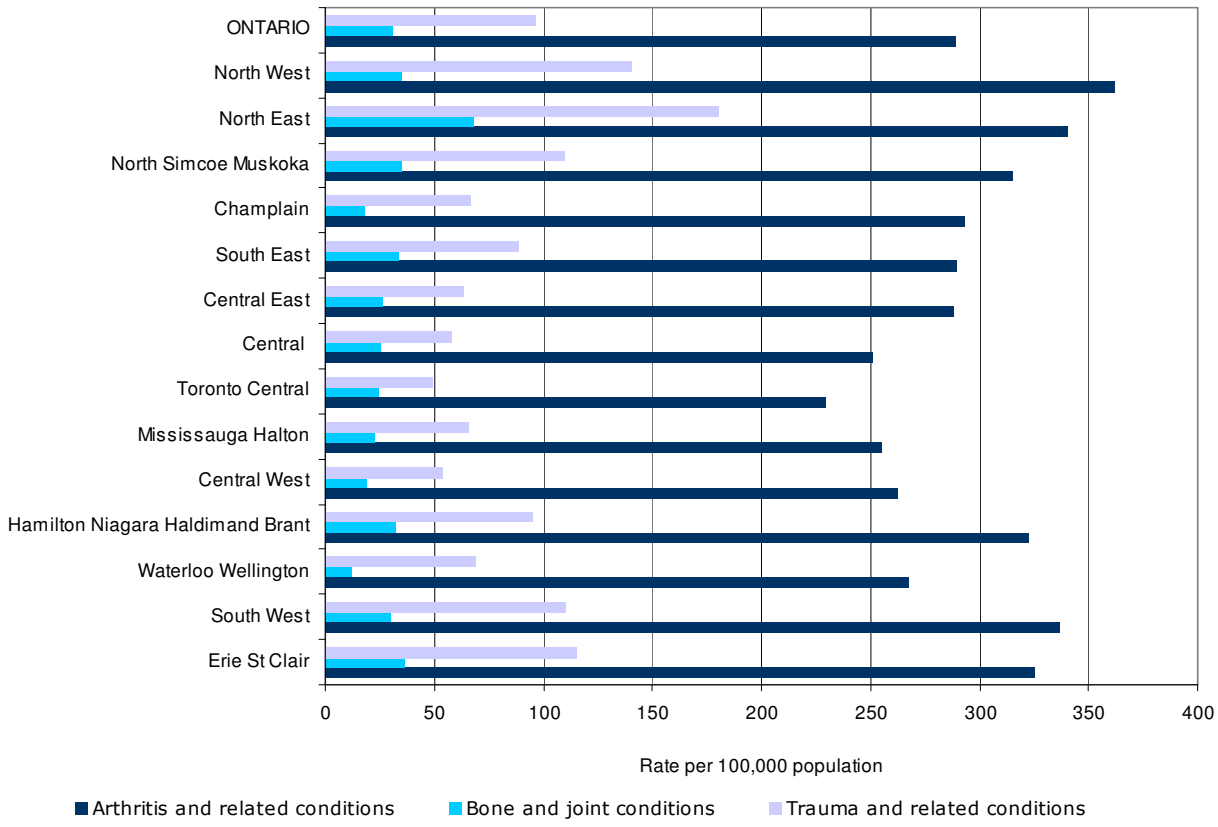
Figure 12: Age and sex standardized person-visit rate to Emergency Departments per 100,000 population by diagnostic groups and by Local Health Integration Networks, Ontario, 2006/07



Data Sources: NACRS

Rates for arthritis and related conditions were higher for same day surgeries in all LHINs, followed by trauma and related in conditions (Figure 13). LHINs in the Greater Toronto Area generally had the lowest rates for arthritis and related conditions. Rates per 100,000 population for arthritis and related conditions ranged from 229.7 in Toronto Central LHIN to 361.9 in the North West LHIN.

Figure 13: Age and sex standardized day surgery rate per 100,000 population by diagnostic groups and by Local Health Integration Networks, Ontario, 2006/07

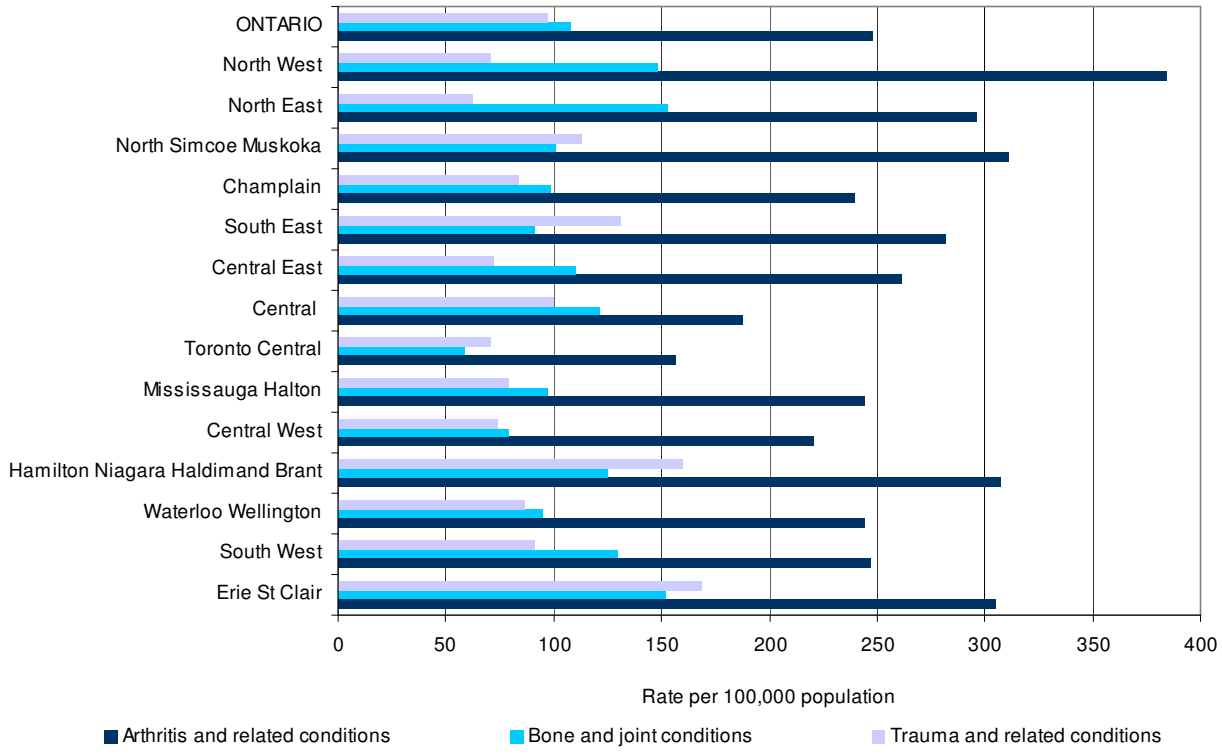


Data Sources: NACRS

Rates for inpatient hospitalization vary across the province by the conditions studied, but in all LHINs arthritis and related conditions was the most common reason for hospitalization among musculoskeletal conditions (Figure 14). Overall, bone and joint conditions ranked second in rates for inpatient care; however, in some LHINs, trauma and related conditions were higher. LHINs in the Greater Toronto Area had among the lowest rates of hospitalization for arthritis with Toronto Central LHIN recording the lowest rate at 156.6 per 100,000 population. LHINs in the North had the highest rates per 100,000 population (North West LHIN at 384.3 and North Simcoe Muskoka at 310.9). For bone and joint conditions, Toronto Central LHIN had the lowest rate (58.9) again, and the North East LHIN had the highest rate (152.9). In contrast, the Northern LHINs had the lowest hospitalization rates per 100,000 population for trauma and

related conditions (North East LHIN 62.3 and North West LHIN 70.5) while the highest rate was in Erie St. Clair LHIN (168.8).

Figure 14: Age and sex standardized inpatient hospitalization rate per 100,000 population by diagnostic groups and by Local Health Integration Networks, Ontario, 2006/07

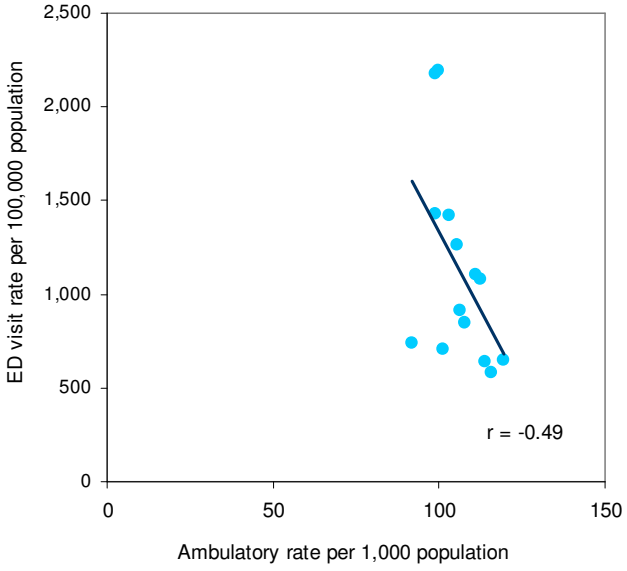


Data Sources: DAD

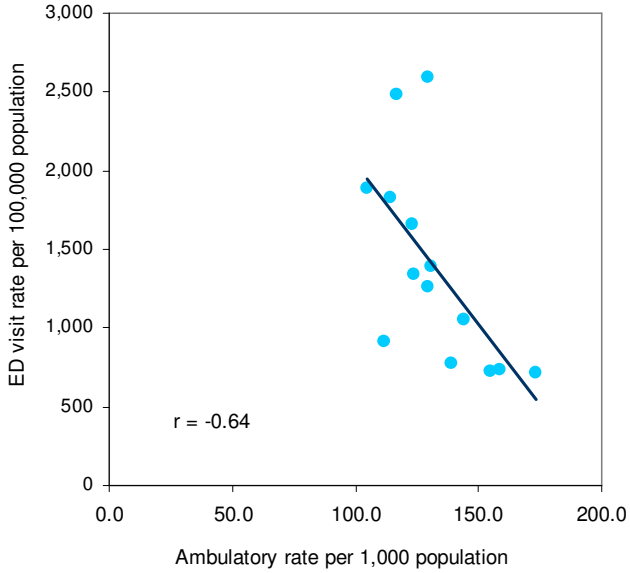
Figure 15 illustrates the relationship between the rate of ambulatory visits to all physicians and the rate of emergency department visits by LHIN. There is an inverse relationship between the two rates; LHINs with higher ambulatory visit rates tended to have lower emergency department visit rates for the three major condition groups studied.

Figure 15: Relationship between the **ambulatory person-visit rate** to all physicians (per 1,000 population) and the **emergency department** (ED) visit rate per 100,000 population by diagnostic groups and Local Health Integration Networks, Ontario, 2006/07

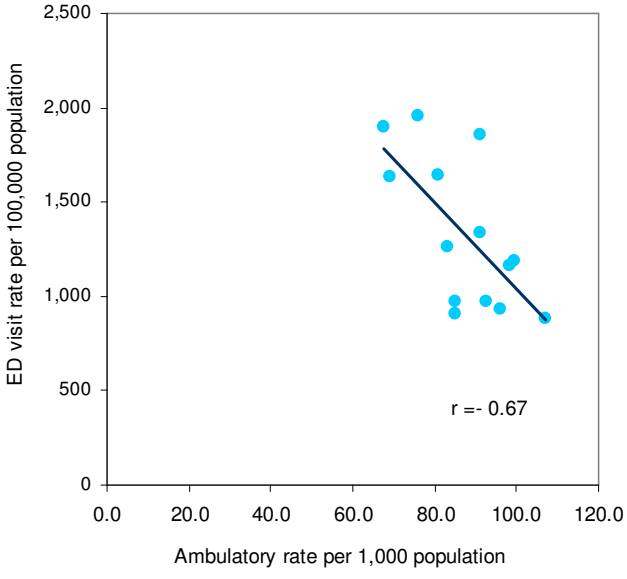
(a) Arthritis and related conditions



(b) Bone and joint



(c) Trauma and related conditions

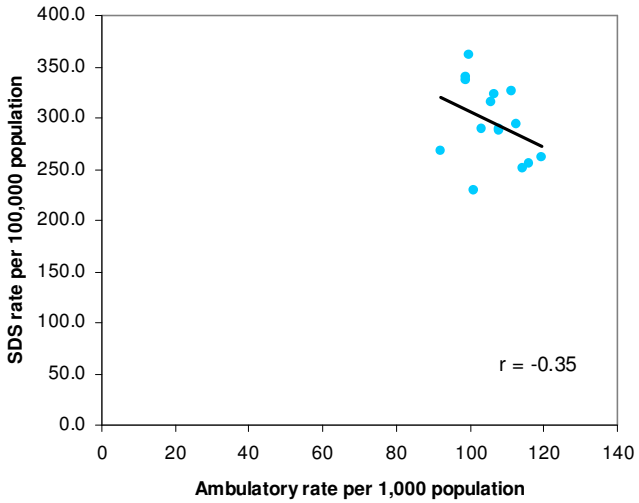


Data Sources: OHIP, NACRS
Note: r represents correlation coefficient

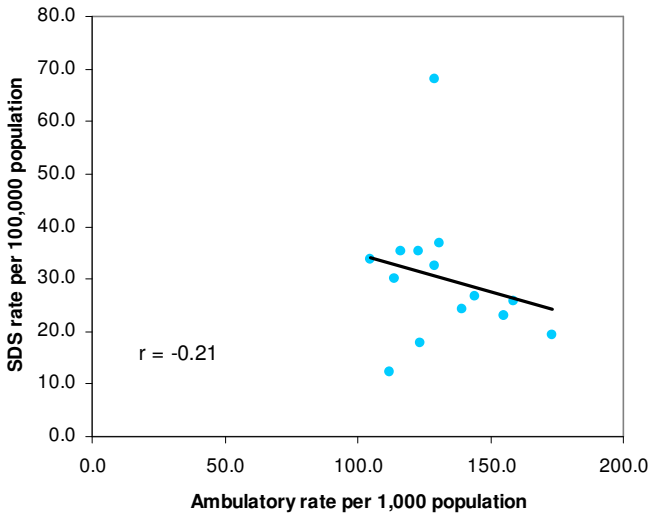
Figures 16 and 17 show the relationship of the ambulatory rate to all physicians and the same day surgery and inpatient rates by LHIN. There was a small inverse relationship between rates of ambulatory visits and same day surgeries for arthritis and related conditions and bone and joint conditions. However, there was a moderate inverse relationship between the rates for trauma and related conditions; LHINs with higher ambulatory rates tended to have lower same day surgery rates. There were no notable relationships between inpatient and ambulatory rates for any condition.

Figure 16: Relationship between the **ambulatory person-visit rate** to all physicians (per 1,000 population) and the **same day surgery rate** (SDS) per 100,000 population by diagnostic groups and Local Health Integration Networks, Ontario, 2006/07

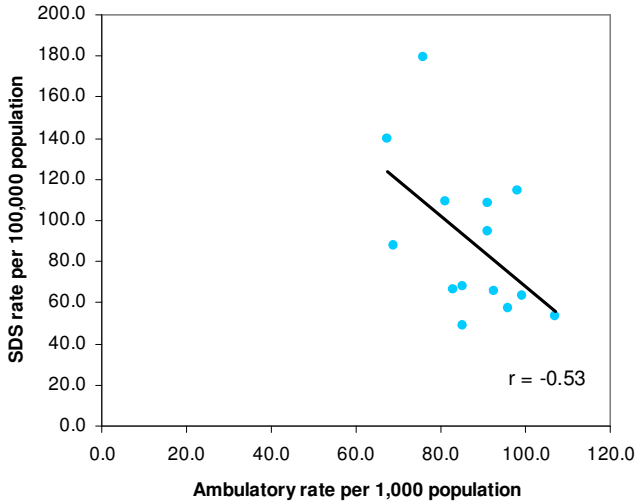
(a) Arthritis and related conditions



(b) Bone and joint



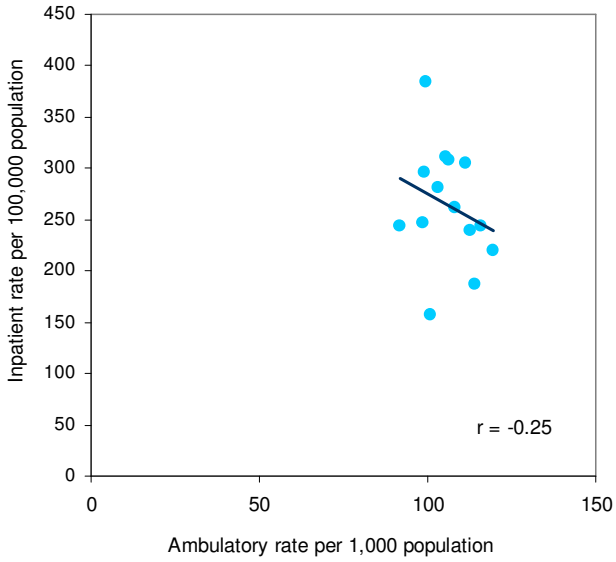
(c) Trauma and related conditions



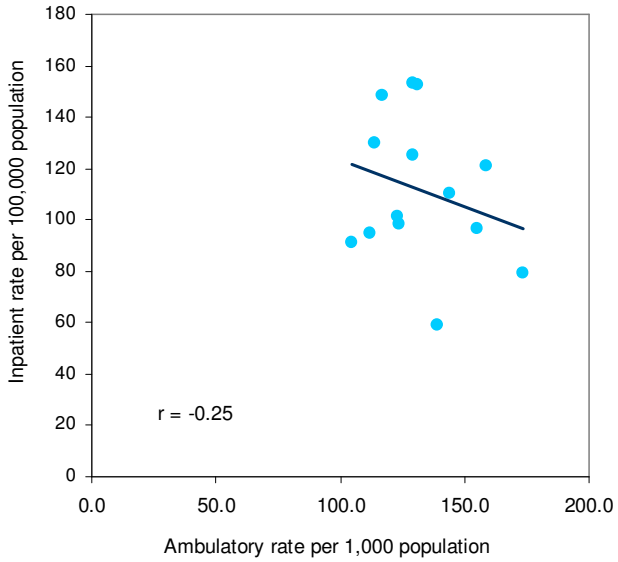
Data Sources: OHIP, NACRS
Note: r represents correlation coefficient

Figure 17: Relationship between the **ambulatory person-visit rate** to all physicians (per 1,000 population) and the **inpatient rate** per 100,000 population by diagnostic groups and Local Health Integration Networks, Ontario, 2006/07

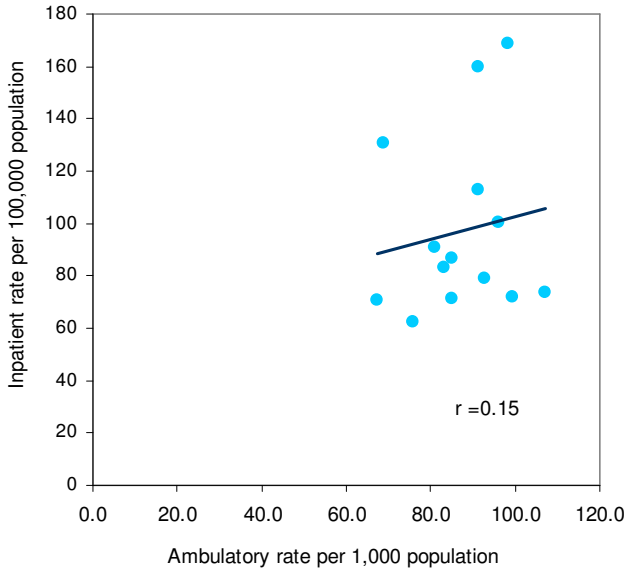
(a) Arthritis and related conditions



(b) Bone and joint



(c) Trauma and related conditions

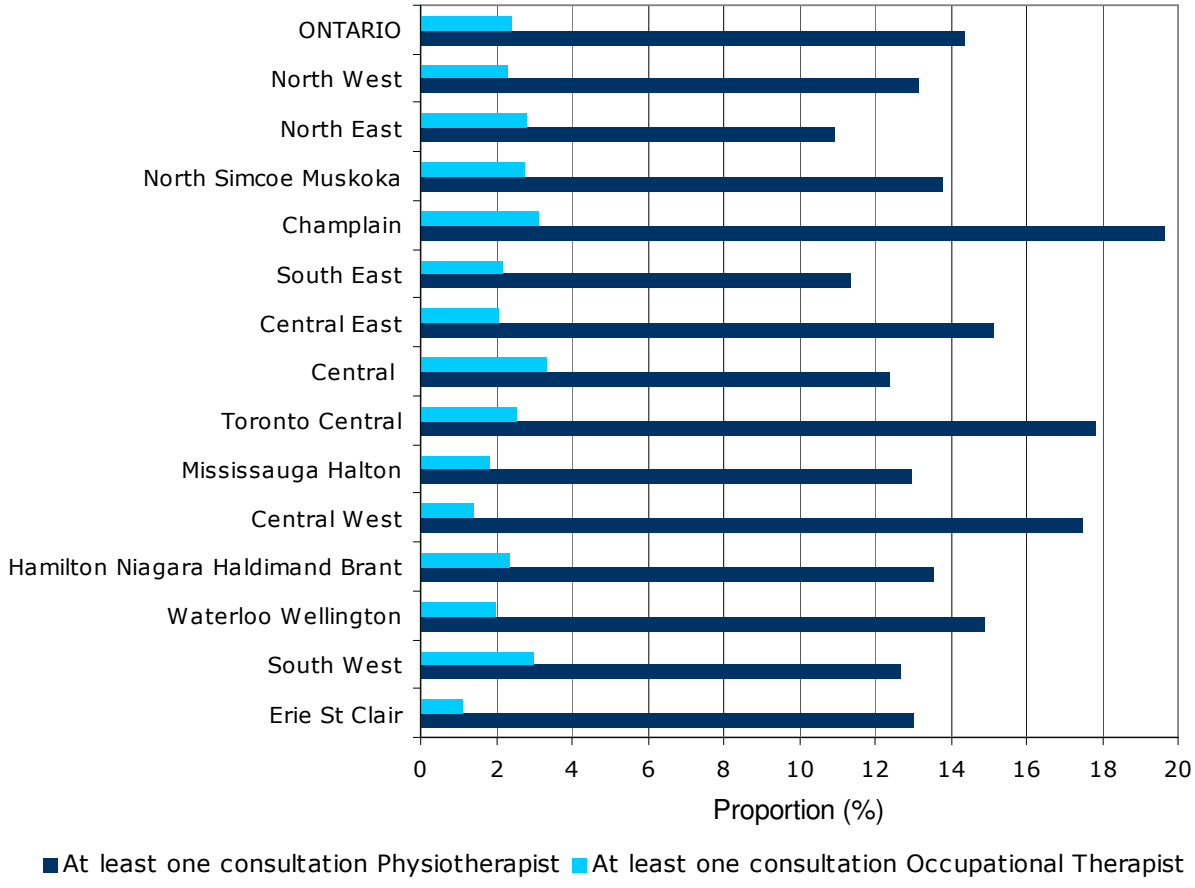


Data Sources: OHIP, NACRS
Note: r represents correlation coefficient

3.4 Rehabilitation Services for Persons with Musculoskeletal Conditions in Ontario

There are no routine health services data for rehabilitation in the community in Ontario. However, a question in the CCHS asks respondents about visits to a range of rehabilitation professionals in the previous year. Figure 18 displays the proportion of the population having at least one consultation with physiotherapist and occupational therapist or speech language pathologist for a musculoskeletal condition (arthritis or rheumatism, back pain or fibromyalgia). About 14% of the population with musculoskeletal conditions consulted with a physiotherapist at least once and only 2% consulted an occupational therapist or speech language pathologist. Variation in the proportion consulting physiotherapists was seen across LHINs (extremal quotient 1.8), Champlain LHIN had the highest proportion and North East LHIN had the lowest proportion.

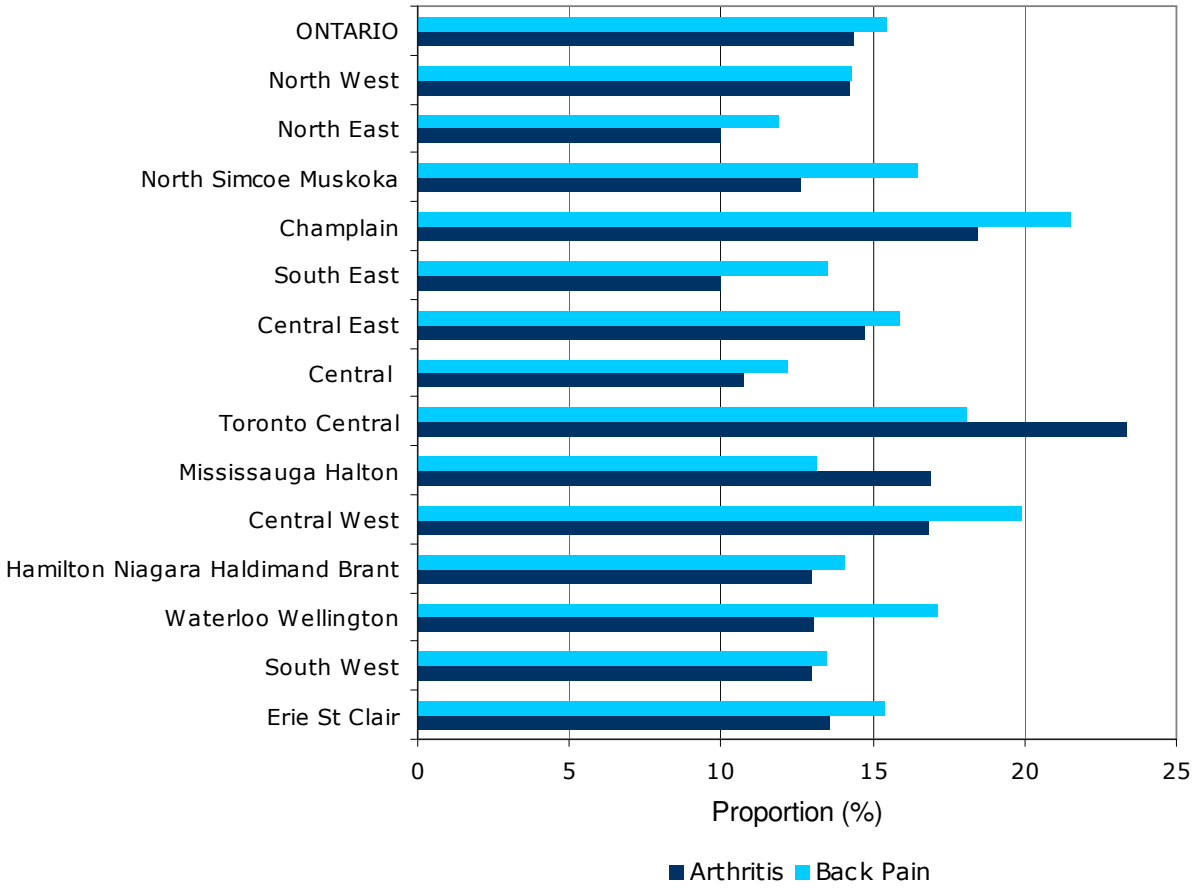
Figure 18: Utilization of physiotherapy services and occupational therapy or speech language pathology services for Musculoskeletal conditions* by Local Health Integration Networks, Ontario, 2003



Data Sources: Canadian Community Health Survey, cycle 2.1 [2003], Statistics Canada, Master File, Research Data Centre, University of Toronto
* Arthritis, Back pain or Fibromyalgia

The proportion of persons consulting physiotherapists for arthritis was slightly lower than the proportion for back pain (14.8% and 15.1% respectively) (Figure 19). Variation was seen across LHINs: North East and South East LHINs had the lowest proportions for arthritis while the Toronto Central LHIN had the highest. Toronto Central and Mississauga Halton LHINs had significantly higher proportions of persons consulting for arthritis than the proportions consulting for back pain.

Figure 19: Utilization of physiotherapy services for arthritis and back pain by Local Health Integration Networks, Ontario, 2003



Data Sources: Canadian Community Health Survey, cycle 2.1 [2003], Statistics Canada, Master File, Research Data Centre, University of Toronto

While data on ambulatory visits to rehabilitation providers (e.g. in outpatient departments in hospitals, community health centres, private clinics) are not available, we are aware that a high percentage of the care provided in these settings is typically for musculoskeletal conditions. To a lesser extent, persons may be admitted to an inpatient rehabilitation setting to receive care and some limited data are available. In 2005/06, almost half (49%) of all clients reported to receive inpatient rehabilitation had an orthopaedic condition, such as hip fracture, hip replacement or knee replacement. Orthopaedic clients in inpatient rehabilitation settings tend to be older females[26].

4.0 Discussion

Musculoskeletal conditions are the most frequent group of chronic conditions in the population[1] and this is reflected in the volume of ambulatory consultations with physicians. In Ontario, in the 2006 fiscal year, about 22% of the population made at least one visit to a physician for a musculoskeletal disorder; of all physician visits, 27% were for musculoskeletal conditions. On average, each person made about three visits, for an estimated total of 8.7 million visits for all musculoskeletal conditions.

Overall, the proportion of the population making visits increased with age. For all ages, the proportion of the population that visited for bone and joint conditions was the highest, followed by arthritis and trauma, respectively. However, the relative proportion with different conditions changed with age, with bone and joint conditions and arthritis and related conditions being most frequent in those aged 65 or more. More women than men made arthritis-related visits, and older persons of both sexes consulted at the highest rates.

Primary care physicians provided the vast majority of care for persons in Ontario with musculoskeletal conditions. Overall, about four out of five persons who visited physicians for musculoskeletal conditions made at least one visit to a primary care physician, 78% of those who visited for arthritis and related conditions, 78% of those who visited for trauma and related conditions and 88% of those who visited for bone and joint conditions. Surgical specialists were most often consulted for fractures and dislocations, osteoarthritis, and joint derangement; individuals with rheumatoid arthritis, connective tissue disorders and ankylosing spondylitis more often sought the help of medical specialists.

Primary care physicians provide most of the care for musculoskeletal conditions. Studies have found deficiencies in the primary care management of musculoskeletal disorders, particularly arthritis[15;27]. The findings in this report further reinforce the need for education about musculoskeletal disorders in medical schools and continuing medical education for practicing physicians. There is also a need for wider application of initiatives targeted to enhancing the primary care management of musculoskeletal disorders. Programs such as *Getting a Grip on Arthritis,* an evidence based interprofessional education program for primary care providers, is an example of such an initiative[28]. The large proportion of care provided by primary care physicians further underlines the opportunities presented by the reform of the health care system with greater opportunities for interdisciplinary primary health care. New models of care for musculoskeletal disorders point to opportunities for extended roles for health professionals such as physical therapists and nurse practitioners in the management of musculoskeletal disorders[29].

Specialty care is still important in the management of musculoskeletal conditions in the community. Surgical specialists are most frequently seen, and these are mainly orthopaedic surgeons, particularly for bone and joint conditions, trauma, and osteoarthritis and joint derangement. Medical specialists have an important part to play for arthritis particularly for inflammatory arthritis such as rheumatoid arthritis and bone and joint conditions. A range of different types of physician were seen, with data in this report presented for rheumatologists and general internists, and also physiatrists. However, these types of specialists only account for two thirds of all medical specialists seen by patients. Further examination showed a wide range of different types of physicians seen. This points again to the importance of the inclusion of musculoskeletal care in general medical education.

Access to orthopaedic services and the associated wait times has been identified as an important first stage in access to total joint replacement, a cost-effective procedure for end stage arthritis. Area variations in the joint replacement surgery rates have been well documented[23;30]. We found variation across the province in consultation with surgical specialists with evidence of some trade-off between the care provided by medical and surgical specialists. It appears that in LHINs with lower proportion of visits to surgical specialists for conditions such as osteoarthritis, a greater proportion of persons visited medical specialists for this condition. This was noted, for example, for osteoarthritis where there was an inverse relationship between the proportion seeing orthopaedic surgeons and the proportion seeing medical specialists. Given that not all persons with osteoarthritis seeing orthopaedic surgeons are ready for surgery and may need conservative management, care by medical specialists could be appropriate in some cases. More generally, ACREU's reports on orthopaedic surgery show that between 28.2% and 34.7% of patients with osteoarthritis seen by orthopaedic surgeons have surgery related to that condition[31]. This suggests that surgeons are also acting in a more general capacity, in effect acting in a medical specialist role. The extent to which they are called upon to play this role may be influenced by the availability of relevant medical specialists. There is documented area variation in provision of specialist services, such as rheumatologists and orthopaedic surgeons, across Ontario.

Integration of data presented here with those from studies of physician supply will enable a detailed examination of utilization of medical services in relation to the availability of care by these specialists. More detailed analyses of the impact of the supply of rheumatologists and orthopaedic surgeons, which take account of the actual volume of care provided, will be possible by linking to ACREU's surveys of orthopaedic surgeons and rheumatologists in Ontario. These document the amount of care (expressed in hours of direct patient care per week) by LHIN, taking account of specialists who work in more than one LHIN.

The analysis presented here has some limitations. First ambulatory visits were estimated using physician billing data. Patients seeing physicians remunerated under alternate payment plans may not be captured, unless there is shadow billing. While the proportion of non-fee-for-service is rising (from approximately 9% in 1993/94 to 17% in 2001/02)[32] , most physicians are required to submit shadow-billings to OHIP and thus were included in this analysis. However, several counties (Hamilton, Waterloo and Algoma) have many physicians enrolled in health service organizations (HSOs), whose activity is not captured in OHIP data. Therefore, some of the variation in person rates may relate to area variations in the availability of provision with alternate payment plans. The data on inpatient admissions and same day surgery used the most responsible diagnosis. This is the diagnosis associated with the longest stay; therefore, admissions for musculoskeletal conditions may be underestimated especially if there was significant comorbidity or complications associated with the admission.

Our findings clearly show that care for musculoskeletal conditions place a significant burden on Ontario's health care system, and that access to care for these disorders varies by LHIN. As the baby boom generation ages and the number of persons affected by musculoskeletal conditions increases, there will be an escalating demand for care. Service providers will have to plan carefully to ensure that those affected have access to the primary and specialist care they require.

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6.0 Technical Appendix

In this report data from different sources were used. These data used two different classification schemes of diagnosis. OHIP used a classification system based on ICD-9 and CIHI's databases used diagnostic codes based on ICD10. We used one claim per visit per patient in OHIP database and the most responsible diagnosis in the hospital databases. The following diagnostic groups were used:

1. **Arthritis and related conditions**: includes osteoarthritis, rheumatoid arthritis, synovitis, ankylosing spondolytis, unspecified soft tissue disorders, connective tissue disorders, joint derangements and other arthritis. Disseminated lupus erythematosus, scleroderma, dermatomyositis and polyarteritis were joined to form a single group of connective tissue diseases. The other arthritis and related conditions group comprised a number of relatively infrequent conditions, the majority of which relate to deformity or malfunction of joints: recurrent dislocation, ankylosis, pyogenic arthritis, and traumatic arthritis.

2. **Bone and joint conditions**: includes some disorders of the spine (e.g. lumbar strains, sciatica, scoliosis), conditions of the bone (e.g. osteomelytis, osteoporosis, osteochondritis), conditions of the foot (e.g. corns and calluses, hallux vagus, hammer toe, ingrown nails and onychogryposis), and other musculoskeletal conditions.

3. **Trauma and related conditions**: includes fractures and dislocations; strains and sprains; and other trauma (e.g. concussions, lacerations, other injuries). Fractures and dislocations of the spine are included in this category.