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# Changes to acute-care hospitalizations among Indigenous children and youth: Results from the 2006 and 2011 Canadian Census Health and Environment Cohorts

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## ABSTRACT

**Background**

This study described the differences in the hospitalization rates of First Nations children and youth living on and off reserve, Inuit children and youth living in Inuit Nunangat (excluding Nunavik), and Métis children and youth, relative to non-Indigenous children and youth and examined rate changes across 2006 and 2011.

**Data and methods**

The 2006 and the 2011 Canadian Census Health and Environment Cohorts provided five years of hospital records that Statistics Canada linked to peoples' self-reported Indigenous identity as recorded on the census. Causes of hospitalizations were based on the most responsible diagnosis coded according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada, aggregated by chapter code. Age-standardized hospitalization rates (ASHRs) were calculated per 100,000 population. Rate ratios (RRs) were reported for each Indigenous group relative to non-Indigenous children and youth.

**Results**

For the 2006 and the 2011 cohorts, ASHRs were generally higher among Indigenous children and youth than among non-Indigenous children and youth. For some health conditions, hospitalization patterns also varied across the two time periods within the given Indigenous groups. Among children, leading elevated RRs occurred for diseases of the respiratory system, the digestive system and injuries. Elevated mental health-related RRs were observed among all Indigenous groups for both cohort years of youth. Significant increases in mental health-related ASHRs were observed in 2011 compared with 2006 among all youth groups, except for Inuit youth living in Inuit Nunangat, possibly due in part to data limitations. Among Indigenous youth, elevated RRs were observed for pregnancy, childbirth and the puerperium, and for injuries. For all youth (except Inuit), childbirth-related ASHRs decreased in 2011 compared with 2006.

**Interpretation**

Findings align with previously observed hospitalization disparities between Indigenous and non-Indigenous children and youth. These data enabled the tracking of changes over time to partly address national information gaps about population health outcomes for children and youth, namely hospitalization.

**Keywords**

Canadian Census Health and Environment Cohort, census, record linkage, hospitalization, disaggregation, First Nations, Inuit, Inuit Nunangat, Métis, living on reserve, living off reserve.

## AUTHORS

Gisèle Carrière is with the Health Analysis Division at Statistics Canada and Evelyne Bougie is with the Strategic Analysis, Publications and Training Division at Statistics Canada.

### *What is already known on this subject?*

- Previously reported health disparities between Indigenous and non-Indigenous people have included disproportionate morbidity.
- Previous studies have shown higher acute-care hospitalization rates in Canada among First Nations people, Métis and Inuit than among the non-Indigenous population.

### *What does this study add?*

- To date, no national studies using a standardized approach have investigated changes to patterns of hospitalization rates among Indigenous children and youth in Canada over time.
- Leading cause-specific hospitalization rates, with changes noted over two time periods, are estimated separately for children and youth for First Nations people living on and off reserve, Inuit living in Inuit Nunangat (excluding Nunavik), and Métis and are also compared with the rates for non-Indigenous children and youth.
- This study partly fills existing data gaps to more comprehensively report the health care use of Indigenous populations.

In 2015, the Truth and Reconciliation Commission (TRC) of Canada placed child well-being foremost in its Calls to Action. Call to Action 19 calls upon the federal government to identify the gaps in health outcomes between Indigenous and non-Indigenous people, including the measurement of long-term trends.[1] Regularly reported national population health outcomes for Indigenous children and youth are important to evaluate health disparity and trends. Providing this evidence informs policy aimed at narrowing differences in health outcomes between population groups and aligns with priorities, such as the federal response to the TRC Calls to Action. However, information about these outcomes and trends for Indigenous children and youth has remained lacking, partly because routinely collected national administrative population health data typically lack information about Indigenous identity.

Previously reported health disparities between Indigenous and non-Indigenous people have included disproportionate morbidity,[2,3,4,5] specifically for children and youth;[6,7,8] mortality;[9,10] and shortened life expectancy.[11] Interpretation of health differences between Indigenous and non-Indigenous populations requires the acknowledgment of the distinct socioeconomic health determinants, including different health service delivery models for Indigenous people in Canada, that are rooted in historical and ongoing processes of colonization,[12,13,14] and that carry intergenerational adverse health impacts.[15] Others have characterized Canada's health care system as lacking in culturally relevant programs and as systemically discriminatory, whereby Indigenous people experience care differently than others.[8,12,16,17,18] Based on this, disparate rates of hospital use among Indigenous children and youth were expected when compared with those of non-Indigenous children and youth. However, national results about changes to hospitalization patterns over time for the children and youth of each Indigenous group are unknown.

Recently, standardized methods for creating linked data at Statistics Canada have been applied to current and past long-form census questionnaires and the National Household Survey (NHS).[19] This prospective linkage allows for the comparison of different cohorts over time to conduct trend analyses.[20,21] Data were linked at Statistics Canada to provide prospective health outcomes information and are leveraged here to report new information about hospitalizations and changes to health outcomes among First Nations, Inuit and Métis children and youth over time. National figures for changes to these prospectively linked outcomes for children and youth have not yet been accordingly, or routinely published for Canada.

The objectives of this study are to assess whether there is national variation in acute-care hospitalizations for children and youth by Indigenous group and to identify changes in hospitalization patterns between 2006 and 2011.

This study extends previous work[6] by separately reporting the hospitalization rates for two cohorts of First Nations children and youth living on or off reserve, Métis children and youth, and Inuit children and youth living in Inuit Nunangat (excluding Nunavik), relative to the rates among non-Indigenous children and youth.

## Methods

### Data sources

This study used the 2006 and 2011 Canadian Census Health and Environment Cohorts (CanCHECs).[19,20] Further details about the CanCHECs and the contributing databases are available at https://www.statcan.gc.ca/en/microdata/data-centres/data/canchec.

The CanCHECs provide linked data that combine hospital patients' records from the Discharge Abstract Database (DAD) with

responses to the long-form census questionnaire and the NHS. The DAD contains hospital patient records compiled by all provinces and territories except Quebec.[22] The Canadian Institute for Health Information (CIHI) provides the DAD to Statistics Canada annually. This linkage enabled the

**Table 1-1**

**Age-standardized[1] hospitalization rates per 100,000 person-years and rate ratios[2] for the household population, by cause[3] and population group, children aged 0 to 9 years, Canada (excluding Quebec[4]), 2006 and 2011 cohorts**

| | 2006 | | | | | |
|---|---|---|---|---|---|---|
| | | 95% Confidence interval | | Rate | 95% Confidence interval | |
| Causes of hospitalization[3] | ASHR | from | to | ratio[2] | from | to |
| **First Nations children living on reserve[5] (excluding Quebec)[4]** | | | | | | |
| **0 to 9 years** | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 4,312.4 | 4,152.7 | 4,472.2 | 2.1 | 2.0 | 2.2 |
| Diseases of the digestive system | 383.2 | 345.2 | 421.1 | 1.7 | 1.5 | 1.9 |
| Diseases of the respiratory system | 1,485.7 | 1,406.0 | 1,565.4 | 2.6 | 2.4 | 2.7 |
| Diseases of the circulatory system | 31.7 | 22.0 | 41.5 | 1.4 | 1.0 | 1.9 |
| Mental and behavioural disorders | 22.8 | 14.9 | 30.7 | 0.9 | 0.6 | 1.4 |
| Endocrine, nutritional and metabolic diseases | 57.2 | 34.0 | 80.4 | 1.0 | 0.7 | 1.5 |
| Diseases of the genitourinary system | 163.0 | 139.6 | 186.5 | 2.3 | 2.0 | 2.7 |
| Diseases of the musculoskeletal system and connective tissue | 69.1 | 54.8 | 83.4 | 1.3 | 1.1 | 1.7 |
| Injuries | 639.7 | 594.2 | 685.1 | 2.7 | 2.5 | 2.9 |
| **First Nations children living off reserve[5] (excluding Quebec)[4]** | | | | | | |
| **0 to 9 years** | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 3,234.2 | 2,933.8 | 3,534.6 | 1.6 | 1.4 | 1.7 |
| Diseases of the digestive system | 282.9 | 226.4 | 339.4 | 1.3 | 1.0 | 1.6 |
| Diseases of the respiratory system | 1,075.5 | 909.1 | 1,242.0 | 1.9 | 1.6 | 2.2 |
| Diseases of the circulatory system | 46.5 | 17.2 | 75.8 | 2.0 | 1.1 | 3.8 |
| Mental and behavioural disorders | 28.2 | 6.4 | 50.0 | 1.2 | 0.5 | 2.5 |
| Endocrine, nutritional and metabolic diseases | 71.4 | 29.7 | 113.1 | 1.3 | 0.7 | 2.3 |
| Diseases of the genitourinary system | 139.6 | 95.2 | 183.9 | 2.0 | 1.4 | 2.7 |
| Diseases of the musculoskeletal system and connective tissue | 49.4 | 26.1 | 72.8 | 1.0 | 0.6 | 1.5 |
| Injuries | 416.1 | 355.1 | 477.1 | 1.8 | 1.5 | 2.1 |
| **Inuit children living in Inuit Nunangat (excluding Nunavik)[4]** | | | | | | |
| **0 to 9 years** | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 3,714.9 | 3,301.1 | 4,128.6 | 1.8 | 1.6 | 2.0 |
| Diseases of the digestive system | 287.2 | 203.7 | 370.7 | 1.3 | 1.0 | 1.7 |
| Diseases of the respiratory system | 1,263.7 | 1,062.1 | 1,465.3 | 2.2 | 1.8 | 2.6 |
| Diseases of the circulatory system | x | x | x | x | x | x |
| Mental and behavioural disorders | x | x | x | x | x | x |
| Endocrine, nutritional and metabolic diseases | x | x | x | x | x | x |
| Diseases of the genitourinary system | 78.2 | 41.0 | 115.4 | 1.1 | 0.7 | 1.8 |
| Diseases of the musculoskeletal system and connective tissue | x | x | x | x | x | x |
| Injuries | 487.0 | 387.5 | 586.4 | 2.1 | 1.7 | 2.5 |
| **Métis children (excluding Quebec)[4]** | | | | | | |
| **0 to 9 years** | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 2,840.4 | 2,566.0 | 3,114.8 | 1.4 | 1.2 | 1.5 |
| Diseases of the digestive system | 254.5 | 197.8 | 311.1 | 1.1 | 0.9 | 1.4 |
| Diseases of the respiratory system | 897.0 | 775.5 | 1,018.4 | 1.5 | 1.3 | 1.8 |
| Diseases of the circulatory system | 35.2 | 12.8 | 57.7 | 1.5 | 0.8 | 2.9 |
| Mental and behavioural disorders | 47.1 | 13.5 | 80.6 | 1.9 | 0.9 | 4.0 |
| Endocrine, nutritional and metabolic diseases | 77.0 | 36.8 | 117.3 | 1.4 | 0.8 | 2.3 |
| Diseases of the genitourinary system | 125.3 | 70.6 | 180.1 | 1.8 | 1.1 | 2.8 |
| Diseases of the musculoskeletal system and connective tissue | 55.6 | 31.2 | 80.1 | 1.1 | 0.7 | 1.7 |
| Injuries | 384.3 | 308.2 | 460.4 | 1.6 | 1.3 | 2.0 |
| **Non-Indigenous children (excluding Quebec)[4]** | | | | | | |
| **0 to 9 years** | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 2,086.0 | 2,042.5 | 2,129.5 | ... | ... | ... |
| Diseases of the digestive system | 224.2 | 215.3 | 233.0 | ... | ... | ... |
| Diseases of the respiratory system | 582.9 | 564.9 | 600.9 | ... | ... | ... |
| Diseases of the circulatory system | 23.4 | 20.6 | 26.3 | ... | ... | ... |
| Mental and behavioural disorders | 24.4 | 20.8 | 28.1 | ... | ... | ... |
| Endocrine, nutritional and metabolic diseases | 56.9 | 49.5 | 64.3 | ... | ... | ... |
| Diseases of the genitourinary system | 70.8 | 65.2 | 76.4 | ... | ... | ... |
| Diseases of the musculoskeletal system and connective tissue | 51.9 | 47.7 | 56.1 | ... | ... | ... |
| Injuries | 236.1 | 227.3 | 244.8 | ... | ... | ... |

... not applicable

x suppressed to meet the confidentiality requirements of the *Statistics Act*

‡ The confidence intervals for the rate difference do not overlap

1. Hospitalization rates were age-standardized using the direct method based on the age structure of the national Indigenous population from the 2011 CanCHEC (both sexes combined, Quebec excluded).
2. The reference group for rate ratios (RRs) is the non-Indigenous population (same sex, same cohort). An RR can be said to be significant if its CI does not include zero.
3. Causes of hospitalization are based on the most responsible diagnosis.
4. Discharge Abstract Database data are unavailable for Quebec.
5. To make 2006 Canadian Census Health and Environment Cohort (CanCHEC) rates comparable with 2011 CanCHEC rates, only census subdivisions that were considered to be reserves in 2006 and 2011 were classified as "on reserve."

**Notes:** ASHR = age-standardized hospitalization rate, RR = rate ratio and CI = confidence interval. Collective dwellings were excluded from the 2006 Canadian Census Health and Environment Cohort (CanCHEC) to make rates comparable with the 2011 CanCHEC. Collective dwellings refer to dwellings of a commercial, institutional or communal nature. Collective dwellings include rooming or lodging houses, hotels, motels, tourist homes, nursing homes, hospitals, staff residences, communal quarters of military camps, work camps, jails, missions and group homes. Collective dwellings may be occupied by usual residents or solely by foreign or temporary residents. A sampling weight was applied to make the cohort more representative of the target population and to reduce bias because of missed links. Generalized bootstrap weights were derived from the final cohort weight. Bootstrap replicate weights were used to estimate appropriate standard errors and 95% CIs. In the 2006 CanCHEC, 2006 Census data are linked to the 2006/2007 to 2010/2011 Discharge Abstract Database (DAD) records. In the 2011 CanCHEC, 2011 National Household Survey data are linked to the 2011/2012 to 2015/2016 DAD records.

**Sources:** Statistics Canada, 2006 and 2011 Canadian Census Health and Environment Cohorts.

**Table 1-2**

**Age-standardized[1] hospitalization rates per 100,000 person-years and rate ratios[2] for the household population, by cause[3] and population group, children aged 0 to 9 years, Canada (excluding Quebec[4]), 2006 and 2011 cohorts**

| | 2011 | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 95% Confidence interval | | | 95% Confidence interval | | Rate difference in 2011 from |
| Causes of hospitalization[3] | ASHR | from | to | Rate ratio[2] | from | to | 2006 |
| **First Nations children living on reserve[5] (excluding Quebec)[4]** | | | | | | | |
| **0 to 9 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 3,756.2 | 3,597.2 | 3,915.1 | 1.9 | 1.8 | 2.0 | -556.2 ‡ |
| Diseases of the digestive system | 297.1 | 265.7 | 328.4 | 2.0 | 1.8 | 2.3 | -86.1 ‡ |
| Diseases of the respiratory system | 1,095.7 | 1,022.5 | 1,168.8 | 2.0 | 1.9 | 2.2 | -390.0 ‡ |
| Diseases of the circulatory system | 41.0 | 28.7 | 53.4 | 1.3 | 1.0 | 1.9 | 9.3 |
| Mental and behavioural disorders | 47.5 | 33.8 | 61.2 | 2.2 | 1.6 | 3.1 | 24.7 ‡ |
| Endocrine, nutritional and metabolic diseases | 44.6 | 28.0 | 61.2 | 0.8 | 0.6 | 1.2 | -12.6 |
| Diseases of the genitourinary system | 125.1 | 103.8 | 146.5 | 2.2 | 1.8 | 2.6 | -37.9 |
| Diseases of the musculoskeletal system and connective tissue | 63.6 | 48.8 | 78.3 | 1.3 | 1.0 | 1.6 | -5.5 |
| Injuries | 519.1 | 478.3 | 560.0 | 2.2 | 2.0 | 2.5 | -120.6 ‡ |
| **First Nations children living off reserve[5] (excluding Quebec)[4]** | | | | | | | |
| **0 to 9 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 2,975.8 | 2,381.0 | 3,570.6 | 1.5 | 1.2 | 1.8 | -258.4 |
| Diseases of the digestive system | 389.1 | 37.3 | 741.0 | 2.6 | 1.1 | 6.5 | 106.2 |
| Diseases of the respiratory system | 692.9 | 573.4 | 812.4 | 1.3 | 1.1 | 1.5 | -382.6 ‡ |
| Diseases of the circulatory system | 22.0 | 6.1 | 37.9 | 0.7 | 0.3 | 1.5 | -24.5 |
| Mental and behavioural disorders | 71.0 | 35.5 | 106.6 | 3.4 | 2.0 | 5.7 | 42.8 |
| Endocrine, nutritional and metabolic diseases | 53.7 | 16.8 | 90.5 | 1.0 | 0.5 | 2.0 | -17.7 |
| Diseases of the genitourinary system | 85.5 | 25.2 | 145.8 | 1.5 | 0.7 | 3.0 | -54.1 |
| Diseases of the musculoskeletal system and connective tissue | 47.1 | 25.1 | 69.1 | 0.9 | 0.6 | 1.5 | -2.3 |
| Injuries | 388.2 | 272.9 | 503.5 | 1.7 | 1.2 | 2.3 | -27.9 |
| **Inuit children living in Inuit Nunangat (excluding Nunavik)[4]** | | | | | | | |
| **0 to 9 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 3,540.5 | 3,139.6 | 3,941.5 | 1.8 | 1.6 | 2.0 | -174.4 |
| Diseases of the digestive system | 285.0 | 197.5 | 372.6 | 1.9 | 1.4 | 2.6 | -2.2 |
| Diseases of the respiratory system | 993.9 | 829.2 | 1,158.6 | 1.9 | 1.6 | 2.2 | -269.8 |
| Diseases of the circulatory system | 70.1 | 19.0 | 121.3 | 2.3 | 1.1 | 4.8 | x |
| Mental and behavioural disorders | x | x | x | x | x | x | x |
| Endocrine, nutritional and metabolic diseases | x | x | x | x | x | x | x |
| Diseases of the genitourinary system | 41.1 | 13.3 | 68.8 | 0.7 | 0.4 | 1.4 | -37.1 |
| Diseases of the musculoskeletal system and connective tissue | 92.5 | 43.9 | 141.0 | 1.9 | 1.1 | 3.2 | x |
| Injuries | 429.4 | 326.1 | 532.8 | 1.9 | 1.5 | 2.4 | -57.6 |
| **Métis children (excluding Quebec)[4]** | | | | | | | |
| **0 to 9 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 1,970.4 | 1,737.6 | 2,203.1 | 1.0 | 0.9 | 1.1 | -870.0 ‡ |
| Diseases of the digestive system | 130.3 | 77.1 | 183.4 | 0.9 | 0.6 | 1.3 | -124.2 ‡ |
| Diseases of the respiratory system | 596.2 | 485.0 | 707.3 | 1.1 | 0.9 | 1.3 | -300.8 ‡ |
| Diseases of the circulatory system | 17.9 | 6.6 | 29.2 | 0.6 | 0.3 | 1.1 | -17.3 |
| Mental and behavioural disorders | 17.3 | 6.8 | 27.7 | 0.8 | 0.4 | 1.5 | -29.8 |
| Endocrine, nutritional and metabolic diseases | 57.9 | 22.7 | 93.2 | 1.1 | 0.6 | 2.0 | -19.1 |
| Diseases of the genitourinary system | 66.1 | 14.9 | 117.2 | 1.1 | 0.5 | 2.5 | -59.2 |
| Diseases of the musculoskeletal system and connective tissue | 39.8 | 17.2 | 62.5 | 0.8 | 0.5 | 1.4 | -15.8 |
| Injuries | 250.0 | 192.8 | 307.2 | 1.1 | 0.9 | 1.4 | -134.3 ‡ |
| **Non-Indigenous children (excluding Quebec)[4]** | | | | | | | |
| **0 to 9 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth are excluded) | 1,989.3 | 1,941.4 | 2,037.2 | ... | ... | ... | -96.7 ‡ |
| Diseases of the digestive system | 148.9 | 139.2 | 158.5 | ... | ... | ... | -75.3 ‡ |
| Diseases of the respiratory system | 537.5 | 519.3 | 555.7 | ... | ... | ... | -45.4 ‡ |
| Diseases of the circulatory system | 30.6 | 25.9 | 35.3 | ... | ... | ... | 7.2 |
| Mental and behavioural disorders | 21.2 | 17.4 | 25.0 | ... | ... | ... | -3.2 |
| Endocrine, nutritional and metabolic diseases | 54.3 | 48.4 | 60.2 | ... | ... | ... | -2.6 |
| Diseases of the genitourinary system | 57.8 | 52.4 | 63.2 | ... | ... | ... | -13.0 ‡ |
| Diseases of the musculoskeletal system and connective tissue | 49.9 | 45.2 | 54.6 | ... | ... | ... | -2.0 |
| Injuries | 232.3 | 221.7 | 242.9 | ... | ... | ... | -3.8 ‡ |

... not applicable

x suppressed to meet the confidentiality requirements of the *Statistics Act*

‡ The confidence intervals for the rate difference do not overlap

1. Hospitalization rates were age-standardized using the direct method based on the age structure of the national Indigenous population from the 2011 CanCHEC (both sexes combined, Quebec excluded).

2. The reference group for rate ratios (RRs) is the non-Indigenous population (same sex, same cohort). An RR can be said to be significant if its CI does not include zero.

3. Causes of hospitalization are based on the most responsible diagnosis.

4. Discharge Abstract Database data are unavailable for Quebec.

5. To make 2006 Canadian Census Health and Environment Cohort (CanCHEC) rates comparable with 2011 CanCHEC rates, only census subdivisions that were considered to be reserves in 2006 and 2011 were classified as "on reserve."

**Notes:** ASHR = age-standardized hospitalization rate, RR = rate ratio and CI = confidence interval. Collective dwellings were excluded from the 2006 Canadian Census Health and Environment Cohort (CanCHEC) to make rates comparable with the 2011 CanCHEC. Collective dwellings refer to dwellings of a commercial, institutional or communal nature. Collective dwellings include rooming or lodging houses, hotels, motels, tourist homes, nursing homes, hospitals, staff residences, communal quarters of military camps, work camps, jails, missions and group homes. Collective dwellings may be occupied by usual residents or solely by foreign or temporary residents. A sampling weight was applied to make the cohort more representative of the target population and to reduce bias because of missed links. Generalized bootstrap weights were derived from the final cohort weight. Bootstrap replicate weights were used to estimate appropriate standard errors and 95% CIs. In the 2006 CanCHEC, 2006 Census data are linked to the 2006/2007 to 2010/2011 Discharge Abstract Database (DAD) records. In the 2011 CanCHEC, 2011 National Household Survey data are linked to the 2011/2012 to 2015/2016 DAD records.

**Sources:** Statistics Canada, 2006 and 2011 Canadian Census Health and Environment Cohorts.

socioeconomic and Indigenous identity information provided by respondents on the census or the NHS to be joined with an individual's hospital records. The linkage was approved by Statistics Canada's Strategic Management Committee, and the use of these data is governed by Statistics Canada's Directive on Microdata Linkage.[23] Statistics Canada ensures the protection of participants' privacy with protocols that allow only the employees who are directly involved in conducting database linkages to have limited access to unique identifying information (e.g., names) and restrict access to complete data files containing person-level

characteristic information. All identifying information was removed from the file used for this analysis.

Following Bougie's methods,[24] this study was based on the 2006 and the 2011 CanCHECs. Records from the 2006 Census long-form questionnaire were linked to DAD records with admission dates spanning May 15, 2006, to May 14, 2011, and records from the 2011 NHS were linked to DAD records with admission dates spanning May 10, 2011, to May 9, 2016.

The CanCHECs include the non-institutional population enumerated by the census and who had completed a long-form questionnaire or the NHS (e.g., they exclude people living in residential care). Unlike typical national health surveys, the CanCHECs include people living on reserves. More information about the scope and exclusions of the NHS, such as the population living in collective dwellings, is available elsewhere.[24,25]

This study used only acute-care hospitalization records because coverage for these is comprehensively reported to CIHI.[22] Since 2005, Ontario has recorded mental health and psychiatric inpatient stays for adults and some adolescents in the Ontario Mental Health Reporting System rather than in the DAD;[26] thus, all-cause and mental health acute-care hospitalizations may be underreported for youth in this study. Also, owing to the unavailability of Quebec hospitalizations for linkage[22] people living in Quebec (including Inuit living in the Nunavik region of Inuit Nunangat) are not reflected in this study, and neither are hospitalizations that occurred in Quebec of residents from other provinces, and territories.

### Indigenous identity

Indigenous identity was self-reported by respondents in the 2006 Census and the 2011 NHS. The population living on reserve is further identified according to criteria established by Indigenous Services Canada.[25,27] More information about this, as well as on the limitations from incompletely enumerated reserves and the definition of "living within Inuit Nunangat," is available elsewhere.[24,25,27]

### Causes of hospitalization

The causes of acute-care hospitalizations were coded according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada (ICD-10-CA).[28,29] Records were categorized into aggregated ICD-10-CA diagnostic codes (Appendix A). Individuals are represented more than once if they were hospitalized multiple times during the follow-up period. Reported rates therefore represent hospitalization frequencies for the period and not person counts.

### Analytical techniques

Descriptive statistics were produced. Age-standardized hospitalization rates (ASHRs) per 100,000 population and 95% confidence intervals (CIs) were calculated separately for children and youth of each Indigenous group and for non-Indigenous children and youth. Age standardization used the direct method and, for both cohort outcomes, was based on the age structure of the national Indigenous population from the 2011 CanCHEC (both sexes combined, excluding Quebec). The standardization age groupings were 0 to 9 years, 10 to 19 years, 20 to 29 years, 30 to 39 years, 40 to 49 years, and 50 years and older. The follow-up period was censored if individuals died, as indicated through the CanCHECs' linked data from the Canadian Vital Statistics – Death database.

ASHRs from the 2006 and the 2011 cohorts were compared via a rate difference calculation and were considered significantly different if their CIs did not overlap. Rate ratios (RRs) and 95% CIs were calculated to compare the ASHRs of First Nations, Inuit and Métis children and youth (each separately) with the ASHRs of non-Indigenous children and youth at the national level (excluding Quebec).

Sampling weights were applied to render both cohorts representative of the target population and to reduce non-linkage bias. Bootstrap replicate weights were used to estimate appropriate standard errors and 95% CIs. CanCHEC vetting rules were applied to suppress small counts and estimates to prevent disclosure risks of any confidential information provided to Statistics Canada by survey respondents or through administrative data. Also, to ensure data quality, counts that were too small to produce a reliable statistic were suppressed.

## Results

The total 2006 CanCHEC (Appendix B) consists of an estimated 84,850 First Nations children and youth living on reserve (accounting for 32,875 hospitalizations), 29,960 First Nations children and youth living off reserve (8,015 hospitalizations), 12,105 Inuit living in Inuit Nunangat (excepting Nunavik) (4,110 hospitalizations), 27,075 Métis (6,315 hospitalizations), and 982,835 non-Indigenous children and youth (118,560 hospitalizations).

The total 2011 CanCHEC (Appendix C) has an estimated 82,520 First Nations children and youth living on reserve (accounting for 27,780 hospitalizations), 35,295 First Nations children and youth living off reserve (8,040 hospitalizations), 9,785 Inuit living in Inuit Nunangat (except Nunavik) (3,215 hospitalizations), 26,745 Métis (4,990 hospitalizations), and 1,036,815 non-Indigenous children and youth (116,590 hospitalizations).

For both cohorts, ASHRs, RRs and rate differences are presented separately for children aged 0 to 9 years (Table 1) and youth aged 10 to 19 years (Table 2). RRs use the non-Indigenous population as the reference group. Rate differences compare rates across census years for each identity group.

### All-cause hospitalizations

ASHRs for all-cause hospitalizations (excluding childbirth) were consistently and significantly higher among Indigenous children and youth than non-Indigenous children and youth within the 2006 and 2011 CanCHECs for each identity group,

**Table 2-1**

**Age-standardized[1] hospitalization rates per 100,000 person-years and rate ratios[2] for the household population, by cause[3] and population group, youth aged 10 to 19 years, Canada (excluding Quebec[4]), 2006 and 2011 cohorts**

| | 2006 | | | | | |
|---|---|---|---|---|---|---|
| | | 95% Confidence interval | | Rate | 95% Confidence interval | |
| Causes of hospitalization[3] | ASHR | from | to | ratio[2] | from | to |
| **First Nations youth living on reserve[5] (excluding Quebec)[4]** | | | | | | |
| **10 to 19 years** | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 11,729.6 | 11,427.0 | 12,032.2 | 4.6 | 4.5 | 4.8 |
| All causes combined (hospitalizations for childbirth excluded) | 5,552.8 | 5,399.1 | 5,706.4 | 2.8 | 2.7 | 2.9 |
| Pregnancy, childbirth and the puerperium[5] | 5,682.9 | 5,497.7 | 5,868.0 | 11.1 | 10.6 | 11.6 |
| Diseases of the digestive system | 660.5 | 616.9 | 704.2 | 1.9 | 1.8 | 2.0 |
| Diseases of the respiratory system | 519.5 | 482.2 | 556.8 | 3.0 | 2.8 | 3.3 |
| Diseases of the circulatory system | 63.2 | 50.4 | 76.0 | 1.6 | 1.3 | 2.0 |
| Mental and behavioural disorders | 789.3 | 728.8 | 849.8 | 3.1 | 2.9 | 3.4 |
| Endocrine, nutritional and metabolic diseases | 137.8 | 101.0 | 174.5 | 2.0 | 1.5 | 2.6 |
| Diseases of the genitourinary system | 207.3 | 186.1 | 228.4 | 2.5 | 2.2 | 2.8 |
| Diseases of the musculoskeletal system and connective tissue | 105.7 | 88.6 | 122.8 | 1.2 | 1.0 | 1.4 |
| Injuries | 1,133.8 | 1,082.5 | 1,185.2 | 3.0 | 2.9 | 3.2 |
| **First Nations youth living off reserve[5] (excluding Quebec)[4]** | | | | | | |
| **10 to 19 years** | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 7,184.1 | 6,717.4 | 7,650.9 | 2.8 | 2.7 | 3.0 |
| All causes combined (hospitalizations for childbirth excluded) | 3,772.3 | 3,519.8 | 4,024.9 | 1.9 | 1.8 | 2.0 |
| Pregnancy, childbirth and the puerperium[5] | 3,031.3 | 2,783.3 | 3,279.2 | 5.9 | 5.4 | 6.5 |
| Diseases of the digestive system | 436.1 | 367.8 | 504.3 | 1.3 | 1.1 | 1.5 |
| Diseases of the respiratory system | 387.7 | 315.7 | 459.7 | 2.3 | 1.9 | 2.7 |
| Diseases of the circulatory system | 56.3 | 33.4 | 79.2 | 1.4 | 0.9 | 2.1 |
| Mental and behavioural disorders | 761.2 | 657.6 | 864.8 | 3.0 | 2.6 | 3.5 |
| Endocrine, nutritional and metabolic diseases | 78.3 | 45.5 | 111.2 | 1.1 | 0.7 | 1.7 |
| Diseases of the genitourinary system | 140.6 | 108.5 | 172.8 | 1.7 | 1.3 | 2.1 |
| Diseases of the musculoskeletal system and connective tissue | 100.5 | 70.9 | 130.1 | 1.1 | 0.8 | 1.5 |
| Injuries | 723.2 | 638.6 | 807.7 | 1.9 | 1.7 | 2.2 |
| **Inuit youth living in Inuit Nunangat (excluding Nunavik)[4]** | | | | | | |
| **10 to 19 years** | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 9,669.2 | 8,937.5 | 10,400.9 | 3.8 | 3.5 | 4.1 |
| All causes combined (hospitalizations for childbirth excluded) | 4,985.8 | 4,605.9 | 5,365.8 | 2.5 | 2.3 | 2.7 |
| Pregnancy, childbirth and the puerperium[5] | 4,020.6 | 3,634.0 | 4,407.2 | 7.8 | 7.1 | 8.7 |
| Diseases of the digestive system | 478.7 | 397.2 | 560.1 | 1.4 | 1.2 | 1.6 |
| Diseases of the respiratory system | 487.4 | 382.5 | 592.3 | 2.8 | 2.3 | 3.5 |
| Diseases of the circulatory system | x | x | x | x | x | x |
| Mental and behavioural disorders | 774.5 | 624.8 | 924.3 | 3.1 | 2.5 | 3.7 |
| Endocrine, nutritional and metabolic diseases | x | x | x | x | x | x |
| Diseases of the genitourinary system | 112.6 | 70.3 | 154.9 | 1.3 | 0.9 | 2.0 |
| Diseases of the musculoskeletal system and connective tissue | 66.3 | 34.0 | 98.6 | 0.7 | 0.4 | 1.2 |
| Injuries | 1,090.4 | 953.6 | 1,227.2 | 2.9 | 2.6 | 3.3 |
| **Métis youth (excluding Quebec)[4]** | | | | | | |
| **10 to 19 years** | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 5,229.8 | 4,802.6 | 5,657.1 | 2.1 | 1.9 | 2.3 |
| All causes combined (hospitalizations for childbirth excluded) | 3,001.9 | 2,778.5 | 3,225.3 | 1.5 | 1.4 | 1.6 |
| Pregnancy, childbirth and the puerperium[5] | 2,057.7 | 1,815.3 | 2,300.1 | 4.0 | 3.6 | 4.5 |
| Diseases of the digestive system | 382.6 | 324.8 | 440.5 | 1.1 | 1.0 | 1.3 |
| Diseases of the respiratory system | 283.2 | 235.0 | 331.4 | 1.7 | 1.4 | 2.0 |
| Diseases of the circulatory system | 50.6 | 28.3 | 73.0 | 1.3 | 0.8 | 2.0 |
| Mental and behavioural disorders | 466.9 | 377.4 | 556.4 | 1.9 | 1.5 | 2.3 |
| Endocrine, nutritional and metabolic diseases | 66.9 | 30.8 | 103.0 | 1.0 | 0.6 | 1.6 |
| Diseases of the genitourinary system | 138.0 | 104.6 | 171.5 | 1.6 | 1.3 | 2.1 |
| Diseases of the musculoskeletal system and connective tissue | 105.0 | 74.3 | 135.6 | 1.1 | 0.9 | 1.5 |
| Injuries | 616.2 | 539.9 | 692.5 | 1.6 | 1.5 | 1.9 |
| **Non-Indigenous youth (excluding Quebec)[4]** | | | | | | |
| **10 to 19 years** | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 2,531.3 | 2,481.2 | 2,581.5 | ... | ... | ... |
| All causes combined (hospitalizations for childbirth excluded) | 2,012.4 | 1,981.1 | 2,043.6 | ... | ... | ... |
| Pregnancy, childbirth and the puerperium[5] | 512.7 | 495.9 | 529.6 | ... | ... | ... |
| Diseases of the digestive system | 347.2 | 338.0 | 356.4 | ... | ... | ... |
| Diseases of the respiratory system | 171.6 | 165.0 | 178.2 | ... | ... | ... |
| Diseases of the circulatory system | 39.7 | 36.6 | 42.8 | ... | ... | ... |
| Mental and behavioural disorders | 252.4 | 242.4 | 262.5 | ... | ... | ... |
| Endocrine, nutritional and metabolic diseases | 70.6 | 64.0 | 77.1 | ... | ... | ... |
| Diseases of the genitourinary system | 84.2 | 79.4 | 89.0 | ... | ... | ... |
| Diseases of the musculoskeletal system and connective tissue | 91.9 | 87.5 | 96.3 | ... | ... | ... |
| Injuries | 374.7 | 365.4 | 384.0 | ... | ... | ... |

... not applicable

x suppressed to meet the confidentiality requirements of the *Statistics Act*

‡ The confidence intervals for the rate difference do not overlap

1. Hospitalization rates were age-standardized using the direct method based on the age structure of the national Indigenous population from the 2011 CanCHEC (both sexes combined, Quebec excluded).

2. The reference group for rate ratios (RRs) is the non-Indigenous population (same sex, same cohort). An RR can be said to be significant if its CI does not include zero.

3. Causes of hospitalization are based on the most responsible diagnosis.

4. Discharge Abstract Database data are unavailable for Quebec.

5. To make 2006 Canadian Census Health and Environment Cohort (CanCHEC) rates comparable with 2011 CanCHEC rates, only census subdivisions that were considered to be reserves in 2006 and 2011 were classified as "on reserve."

**Notes:** ASHR = age-standardized hospitalization rate, RR = rate ratio and CI = confidence interval. Collective dwellings were excluded from the 2006 Canadian Census Health and Environment Cohort (CanCHEC) to make rates comparable with the 2011 CanCHEC. Collective dwellings refer to dwellings of a commercial, institutional or communal nature. Collective dwellings include rooming or lodging houses, hotels, motels, tourist homes, nursing homes, hospitals, staff residences, communal quarters of military camps, work camps, jails, missions and group homes. Collective dwellings may be occupied by usual residents or solely by foreign or temporary residents. A sampling weight was applied to make the cohort more representative of the target population and to reduce bias because of missed links. Generalized bootstrap weights were derived from the final cohort weight. Bootstrap replicate weights were used to estimate appropriate standard errors and 95% CIs. In the 2006 CanCHEC, 2006 Census data are linked to the 2006/2007 to 2010/2011 Discharge Abstract Database (DAD) records. In the 2011 CanCHEC, 2011 National Household Survey data are linked to the 2011/2012 to 2015/2016 DAD records.

**Sources:** Statistics Canada, 2006 and 2011 Canadian Census Health and Environment Cohorts.

**Table 2-2**

**Age-standardized[1] hospitalization rates per 100,000 person-years and rate ratios[2] for the household population, by cause[3] and population group, youth aged 10 to 19 years, Canada (excluding Quebec[4]), 2006 and 2011 cohorts**

| | 2011 | | | | | | Rate difference in 2011 from 2006 |
|---|---|---|---|---|---|---|---|
| | | 95% Confidence interval | | Rate ratio[2] | 95% Confidence interval | | |
| Causes of hospitalization[3] | ASHR | from | to | | from | to | |
| **First Nations youth living on reserve[5] (excluding Quebec)[4]** | | | | | | | |
| **10 to 19 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 10,104.3 | 9,672.7 | 10,535.9 | 3.8 | 3.6 | 4.0 | -1,625.3 ‡ |
| All causes combined (hospitalizations for childbirth excluded) | 5,070.0 | 4,876.4 | 5,263.5 | 2.4 | 2.3 | 2.5 | -482.8 ‡ |
| Pregnancy, childbirth and the puerperium[5] | 4,384.4 | 4,119.7 | 4,649.1 | 11.2 | 10.3 | 12.1 | -1,298.5 ‡ |
| Diseases of the digestive system | 592.6 | 548.7 | 636.4 | 1.8 | 1.6 | 1.9 | -67.9 |
| Diseases of the respiratory system | 351.9 | 316.5 | 387.3 | 2.4 | 2.1 | 2.7 | -167.6 ‡ |
| Diseases of the circulatory system | 70.4 | 50.4 | 90.5 | 1.8 | 1.3 | 2.4 | 7.2 |
| Mental and behavioural disorders | 1,188.1 | 1,095.6 | 1,280.6 | 2.7 | 2.5 | 3.0 | 398.8 ‡ |
| Endocrine, nutritional and metabolic diseases | 105.3 | 75.2 | 135.4 | 1.3 | 0.9 | 1.7 | -32.5 |
| Diseases of the genitourinary system | 198.1 | 172.8 | 223.4 | 2.6 | 2.3 | 3.0 | -9.2 |
| Diseases of the musculoskeletal system and connective tissue | 83.3 | 65.7 | 101.0 | 1.0 | 0.8 | 1.2 | -22.4 |
| Injuries | 931.1 | 875.0 | 987.3 | 2.9 | 2.7 | 3.1 | -202.7 ‡ |
| **First Nations youth living off reserve[5] (excluding Quebec)[4]** | | | | | | | |
| **10 to 19 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 6,938.6 | 6,361.4 | 7,515.8 | 2.6 | 2.4 | 2.9 | -245.5 |
| All causes combined (hospitalizations for childbirth excluded) | 3,860.7 | 3,557.1 | 4,164.3 | 1.8 | 1.7 | 2.0 | 88.4 |
| Pregnancy, childbirth and the puerperium[5] | 2,218.2 | 1,960.9 | 2,475.6 | 5.6 | 5.0 | 6.4 | -813.1 ‡ |
| Diseases of the digestive system | 386.0 | 330.1 | 442.0 | 1.2 | 1.0 | 1.3 | -50.1 |
| Diseases of the respiratory system | 244.5 | 186.3 | 302.7 | 1.7 | 1.3 | 2.2 | -143.2 ‡ |
| Diseases of the circulatory system | 49.3 | 28.2 | 70.3 | 1.3 | 0.8 | 2.0 | -7.0 |
| Mental and behavioural disorders | 1,131.1 | 987.3 | 1,275.0 | 2.6 | 2.3 | 3.0 | 369.9 ‡ |
| Endocrine, nutritional and metabolic diseases | 105.2 | 26.0 | 184.3 | 1.3 | 0.6 | 2.7 | 26.9 |
| Diseases of the genitourinary system | 167.8 | 124.1 | 211.5 | 2.2 | 1.7 | 2.9 | 27.2 |
| Diseases of the musculoskeletal system and connective tissue | 78.7 | 54.9 | 102.5 | 0.9 | 0.7 | 1.2 | -21.8 |
| Injuries | 575.4 | 494.5 | 656.4 | 1.8 | 1.6 | 2.1 | -147.8 |
| **Inuit youth living in Inuit Nunangat (excluding Nunavik)[4]** | | | | | | | |
| **10 to 19 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 9,624.5 | 8,643.7 | 10,605.3 | 3.6 | 3.3 | 4.0 | -44.7 |
| All causes combined (hospitalizations for childbirth excluded) | 4,826.4 | 4,369.6 | 5,283.1 | 2.3 | 2.1 | 2.5 | -159.4 |
| Pregnancy, childbirth and the puerperium[5] | 3,645.0 | 3,179.0 | 4,111.1 | 9.3 | 8.1 | 10.6 | -375.6 |
| Diseases of the digestive system | 621.3 | 500.6 | 741.9 | 1.9 | 1.5 | 2.3 | 142.6 |
| Diseases of the respiratory system | 361.6 | 267.9 | 455.3 | 2.5 | 1.9 | 3.2 | -125.8 |
| Diseases of the circulatory system | 45.0 | 15.2 | 74.7 | 1.2 | 0.6 | 2.2 | x |
| Mental and behavioural disorders | 639.7 | 503.6 | 775.9 | 1.5 | 1.2 | 1.8 | -134.8 |
| Endocrine, nutritional and metabolic diseases | x | x | x | x | x | x | x |
| Diseases of the genitourinary system | 65.9 | 35.3 | 96.6 | 0.9 | 0.6 | 1.4 | -46.7 |
| Diseases of the musculoskeletal system and connective tissue | 87.8 | 44.5 | 131.0 | 1.0 | 0.6 | 1.6 | 21.5 |
| Injuries | 865.3 | 723.7 | 1,006.9 | 2.7 | 2.3 | 3.2 | -225.1 |
| **Métis youth (excluding Quebec)[4]** | | | | | | | |
| **10 to 19 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 4,514.5 | 4,017.0 | 5,012.1 | 1.7 | 1.5 | 1.9 | -715.3 |
| All causes combined (hospitalizations for childbirth excluded) | 2,960.2 | 2,684.9 | 3,235.6 | 1.4 | 1.3 | 1.5 | -41.7 |
| Pregnancy, childbirth and the puerperium[5] | 1,332.5 | 1,097.1 | 1,567.9 | 3.4 | 2.8 | 4.1 | -725.2 ‡ |
| Diseases of the digestive system | 415.7 | 349.3 | 482.2 | 1.3 | 1.1 | 1.5 | 33.1 |
| Diseases of the respiratory system | 196.6 | 145.0 | 248.2 | 1.4 | 1.0 | 1.8 | -86.6 |
| Diseases of the circulatory system | 48.0 | 16.4 | 79.6 | 1.2 | 0.6 | 2.4 | -2.6 |
| Mental and behavioural disorders | 714.9 | 605.7 | 824.0 | 1.6 | 1.4 | 1.9 | 248.0 ‡ |
| Endocrine, nutritional and metabolic diseases | 165.0 | 64.1 | 265.9 | 2.0 | 1.1 | 3.7 | 98.1 |
| Diseases of the genitourinary system | 112.3 | 75.4 | 149.1 | 1.5 | 1.1 | 2.1 | -25.7 |
| Diseases of the musculoskeletal system and connective tissue | 79.4 | 50.1 | 108.8 | 0.9 | 0.6 | 1.3 | -25.6 |
| Injuries | 485.2 | 409.7 | 560.8 | 1.5 | 1.3 | 1.8 | -131.0 |
| **Non-Indigenous youth (excluding Quebec)[4]** | | | | | | | |
| **10 to 19 years** | | | | | | | |
| All causes combined (hospitalizations for childbirth included) | 2,650.7 | 2,581.0 | 2,720.5 | ... | ... | ... | 119.4 |
| All causes combined (hospitalizations for childbirth excluded) | 2,111.4 | 2,067.1 | 2,155.7 | ... | ... | ... | 99.0 ‡ |
| Pregnancy, childbirth and the puerperium[5] | 393.3 | 372.7 | 413.9 | ... | ... | ... | -119.4 ‡ |
| Diseases of the digestive system | 333.5 | 322.0 | 345.0 | ... | ... | ... | -13.7 |
| Diseases of the respiratory system | 145.9 | 135.6 | 156.2 | ... | ... | ... | -25.7 ‡ |
| Diseases of the circulatory system | 39.1 | 35.2 | 43.0 | ... | ... | ... | -0.6 |
| Mental and behavioural disorders | 436.2 | 419.7 | 452.8 | ... | ... | ... | 183.8 ‡ |
| Endocrine, nutritional and metabolic diseases | 83.7 | 74.3 | 93.2 | ... | ... | ... | 13.1 |
| Diseases of the genitourinary system | 75.3 | 70.5 | 80.0 | ... | ... | ... | -8.9 |
| Diseases of the musculoskeletal system and connective tissue | 87.9 | 82.5 | 93.3 | ... | ... | ... | -4.0 |
| Injuries | 321.3 | 311.1 | 331.5 | ... | ... | ... | -53.4 ‡ |

... not applicable

x suppressed to meet the confidentiality requirements of the *Statistics Act*

‡ The confidence intervals for the rate difference do not overlap

1. Hospitalization rates were age-standardized using the direct method based on the age structure of the national Indigenous population from the 2011 CanCHEC (both sexes combined, Quebec excluded).

2. The reference group for rate ratios (RRs) is the non-Indigenous population (same sex, same cohort). An RR can be said to be significant if its CI does not include zero.

3. Causes of hospitalization are based on the most responsible diagnosis.

4. Discharge Abstract Database data are unavailable for Quebec.

5. To make 2006 Canadian Census Health and Environment Cohort (CanCHEC) rates comparable with 2011 CanCHEC rates, only census subdivisions that were considered to be reserves in 2006 and 2011 were classified as "on reserve."

**Notes:** ASHR = age-standardized hospitalization rate, RR = rate ratio and CI = confidence interval. Collective dwellings were excluded from the 2006 Canadian Census Health and Environment Cohort (CanCHEC) to make rates comparable with the 2011 CanCHEC. Collective dwellings refer to dwellings of a commercial, institutional or communal nature. Collective dwellings include rooming or lodging houses, hotels, motels, tourist homes, nursing homes, hospitals, staff residences, communal quarters of military camps, work camps, jails, missions and group homes. Collective dwellings may be occupied by usual residents or solely by foreign or temporary residents. A sampling weight was applied to make the cohort more representative of the target population and to reduce bias because of missed links. Generalized bootstrap weights were derived from the final cohort weight. Bootstrap replicate weights were used to estimate appropriate standard errors and 95% CIs. In the 2006 CanCHEC, 2006 Census data are linked to the 2006/2007 to 2010/2011 Discharge Abstract Database (DAD) records. In the 2011 CanCHEC, 2011 National Household Survey data are linked to the 2011/2012 to 2015/2016 DAD records.

**Sources:** Statistics Canada, 2006 and 2011 Canadian Census Health and Environment Cohorts.

except for Métis children in the 2011 cohort (Figure 1). Relative to the non-Indigenous population, significant disparities were observed among First Nations children and youth living on and off reserve and among Inuit children and youth living in Inuit Nunangat in the 2006 and the 2011 cohorts (Table 1 and Table 2). In the 2011 cohort, First Nations children and youth living on reserve were, respectively, 1.9 and 2.4 times more likely to be hospitalized (excluding childbirth) compared with non-Indigenous children and youth. For Inuit children and youth in the 2011 cohort, RRs were 1.8 and 2.3, respectively. Among Indigenous youth, RRs were elevated further in both cohorts when childbirth-related ASHRs were included.

With childbirth excluded, all-cause ASHRs were significantly lower in 2011 compared with 2006 for these identity groups: First Nations children living on reserve, First Nations youth living on reserve, Métis children and non-Indigenous children (Table 1 and Table 2). This difference was not detected for First Nations children and youth living off reserve or for Inuit children and youth living in Inuit Nunangat.

**Cause-specific hospitalizations**

Among children in every identity group in both cohorts, the leading causes of hospitalizations were the same: diseases of the respiratory system, injuries and diseases of the digestive system (Table 1, Figure 2). Among youth, for all groups in both cohorts, hospitalizations were primarily related to pregnancy, childbirth and the puerperium (the period from delivery through the first few weeks thereafter), followed most often by mental health-related conditions and injuries (Table 2, Figure 2). Rate ratios by age groups are shown in Figure 3.

**First Nations children and youth living on reserve**

First Nations children living on reserve in 2006 had higher ASHRs than non-Indigenous children for injuries (RR=2.7), respiratory system diseases (RR=2.6) and diseases of the genitourinary system (RR=2.3). Digestive disorders represented another leading cause of hospitalization, as measured by the absolute frequency estimate and the significantly elevated RR (1.7). In the 2011 cohort, hospitalizations for injuries, diseases of the genitourinary system and mental health-related conditions were more than twice as high (RRs=2.2) among First Nations children living on reserve than among non-Indigenous children.

Over time, specific-cause ASHRs for diseases of the respiratory system, injuries and diseases of the digestive system significantly decreased from 2006 to 2011 among First Nations children living on reserve. However ASHRs for mental health-related hospitalizations were more than twice higher for on-reserve children in the 2011 cohort (ASHR=47.5 per 100,000 population) than observed for the 2006 cohort of on-reserve children (ASHR= 22.8 per 100,000 population).

Among First Nations youth living on reserve, the following were the leading causes of hospitalizations among both cohorts (2006 and 2011): pregnancy, childbirth and the puerperium; injuries; and mental health-related conditions. Pregnancy- and childbirth-related hospitalizations had the highest RRs of all causes in 2006 (RR=11.1) and in 2011 (RR=11.2). In the 2006 cohort, ASHRs for mental health-related conditions (RR=3.1) were more than three times more frequent for First Nations youth living on reserve than for non-Indigenous youth, as were ASHRs for respiratory system diseases (RR=3.0) and injuries (RR=3.0). Among First Nations youth living on reserve in the 2011 cohort, mental health-related hospitalizations ranked as the second most frequent ASHR. ASHRs among this group in this cohort were also elevated for injuries (RR=2.9), mental health-related conditions (RR=2.7), genitourinary system diseases (RR=2.6) and respiratory system diseases (RR=2.4), relative to non-Indigenous youth.

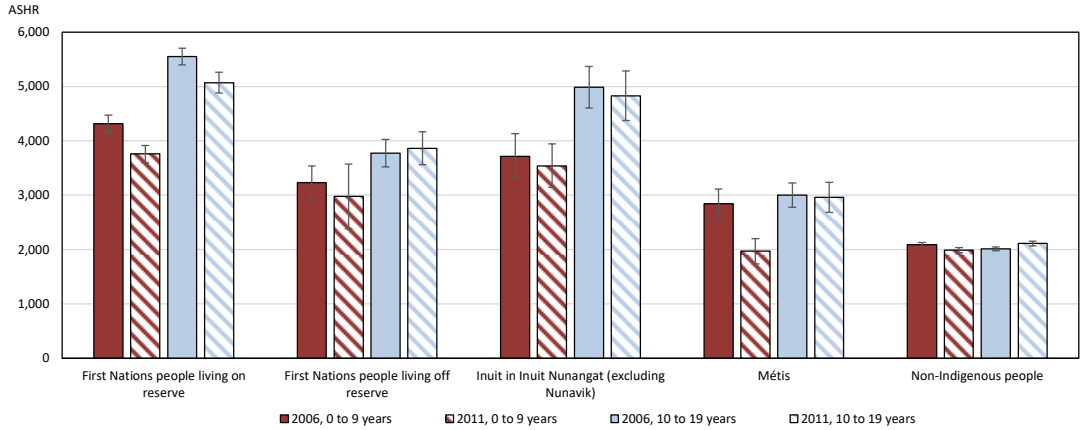
Like the findings for children, mental health-related hospitalizations for First Nations youth living on reserve were significantly higher, by a factor of 1.5 (almost a 51% increase), for the 2011 cohort (ASHR=1,188.1) than for the 2006 cohort (ASHR=789.3). Different from this pattern, significantly lower ASHRs for hospitalizations related to pregnancy, childbirth and the puerperium; injuries; and respiratory system diseases were observed for on-reserve First Nations youth in the 2011 cohort than those for this group in the 2006 cohort.

**First Nations children and youth living off reserve**

Among children who lived off reserve, leading causes of hospitalizations, measured as absolute frequency estimates (Figure 2), were the same in both cohorts: diseases of the respiratory system, injuries and diseases of the digestive system. In relative terms, higher ASHRs were also observed for diseases of the circulatory system (RR=2.0) and diseases of the genitourinary system (RR=2.0) in the 2006 cohort. For children in the 2011 cohort, mental health-related ASHRs were significantly elevated (RR=3.4), as were ASHRs for digestive system diseases (RR=2.6) and injuries (RR=1.7). Across time, fewer hospitalizations for respiratory conditions were detected among First Nations children living off reserve in 2011 (ASHR= 692.9) than in 2006 (ASHR=1,075.5).

Among First Nations youth living off reserve, the same top three causes of hospitalizations were observed in both cohort years: pregnancy, childbirth and the puerperium; mental health conditions; and injuries. Pregnancy- and childbirth-related hospitalizations had greatly elevated RRs within each cohort (RRs=5.9 in 2006 and 5.6 in 2011). But across time, these ASHRs among First Nations youth living off reserve were significantly lower (by about 27%) in 2011 than in 2006 (Table 2). RRs were elevated for mental health-related hospitalizations among First Nations youth living off reserve in the 2006 cohort (RR=3.0) and in the 2011 cohort (RR=2.6). Of significance, the absolute frequency estimates for mental health-related hospitalizations for First Nations youth living off reserve in the 2011 cohort (ASHR=1,131.1) represent an approximate 48% increase over the rate found among First Nations youth living off reserve in the 2006 cohort (ASHR=761.2). Additionally, among First Nations youth living off reserve, respiratory system diseases had significantly

**Figure 1**
**All-cause age-standardized acute-care hospitalization rates per 100,000 population, by population group and age group, Canada (excluding Quebec), 2006 and 2011 cohorts**




**Notes:** Hospitalizations for childbirth are excluded. ASHR = age-standardized hospitalization rate.
**Sources:** Statistics Canada, 2006 and 2011 Canadian Census Health and Environment Cohorts.

elevated RRs in 2006 (2.3) and 2011 (1.7). However, unlike the pattern found for mental health-related ASHRs, there were fewer respiratory disease hospitalizations in the 2011 cohort than in the 2006 cohort.

### Inuit children and youth living in Inuit Nunangat (excluding Nunavik)

The same top three causes of hospitalizations were found among Inuit children living in Inuit Nunangat (excluding Nunavik) in both cohorts (2006 and 2011): diseases of the respiratory system, injuries and diseases of the digestive system. Among the 2006 cohort, elevated hospitalizations were for diseases of the respiratory system (RR=2.2) and injuries (RR=2.1). While rate differences for every reported specific cause of hospitalization of Inuit children living in Inuit Nunagat across the two cohorts suggest a decrease in hospitalizations from 2006 to 2011, the ASHRs were not statistically different (the CIs overlapped); therefore, no changes were detected over time for any reported specific causes among Inuit children in these cohorts (Table 1). Notably, when viewed by specific hospitalization cause, several rates had to be suppressed for Inuit children because of the small size of this population. The unavailability of linked hospitalization information from Quebec likely also contributed to this limitation in the study.

Among Inuit youth living in Inuit Nunangat (excluding Nunavik), leading causes of hospitalizations were the same for both cohorts: pregnancy, childbirth and the puerperium; injuries; and mental health-related conditions and for the 2011 cohort also digestive system diseases. Higher RRs for pregnancy, childbirth and the puerperium were observed among Inuit youth relative to non-Indigenous youth in both cohorts (RRs=7.8 in 2006 and 9.3 in 2011). Also, in 2006, ASHRs for mental health-related conditions and injuries for Inuit youth were about three times higher than those for non-Indigenous youth (RRs=3.1 and 2.9, respectively). For the 2011 cohort, elevated ASHRs for mental health-related conditions (RR=1.5), injuries (RR=2.7) and respiratory system diseases (RR=2.5) were observed for Inuit youth living in Inuit Nunangat.

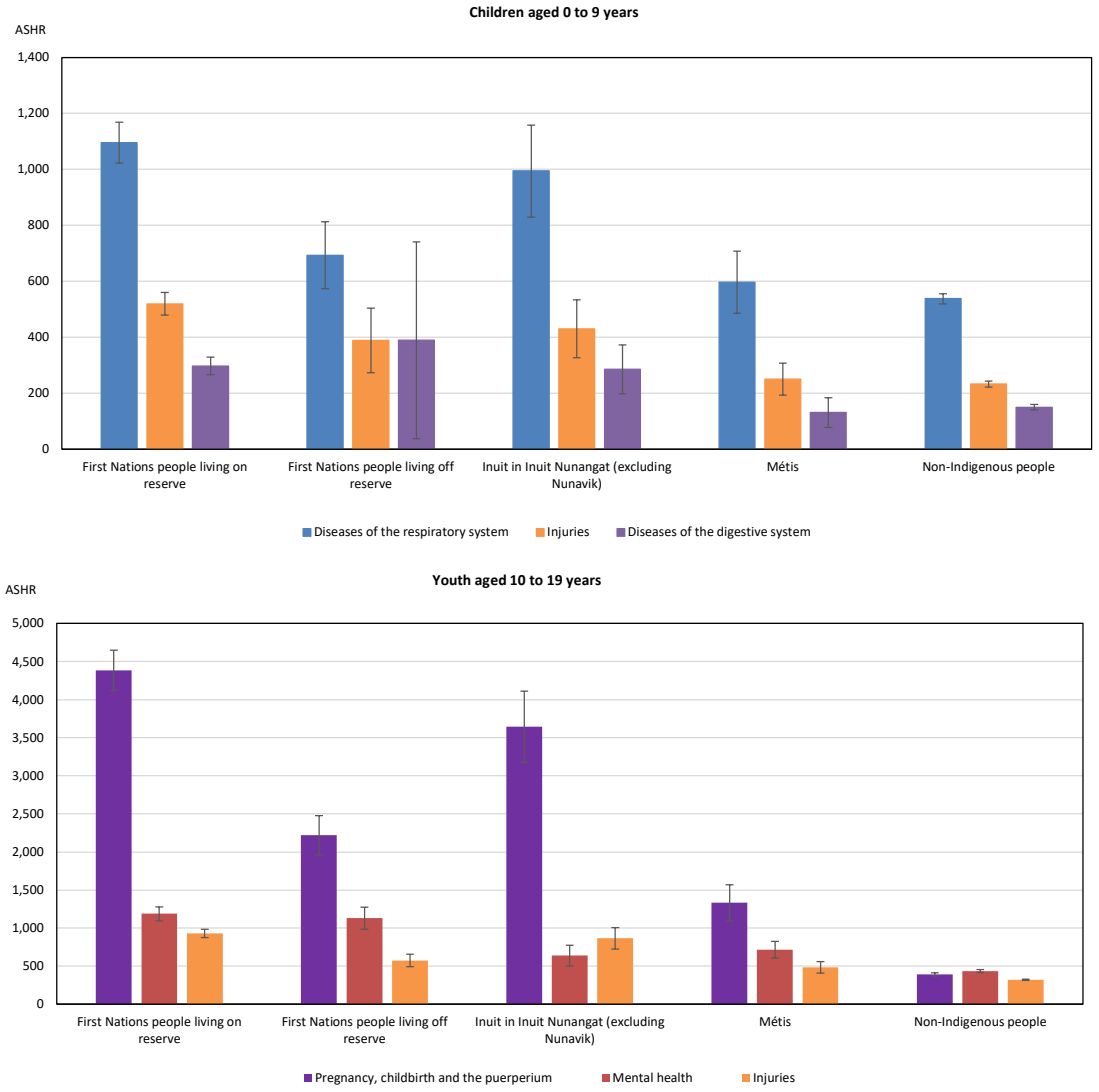
As noted for Inuit children in both cohorts, comparisons of ASHRs across 2006 and 2011 for Inuit youth living in Inuit Nunangat suggested downward-shifting patterns for all-cause and specific-cause hospitalizations over time, but the patterns were not statistically different (the CIs overlapped). Therefore, no change was detected. Again, results may have been different had information on Quebec hospitalizations been available for linkage.

### Métis children and youth

Among Métis children in the 2006 cohort, three causes drove hospitalizations: respiratory system diseases (RR=1.5), injuries (RR=1.6) and digestive system diseases (RR=1.1). In 2011, the leading causes involved respiratory disorders (RR=1.1) and injuries (RR=1.1). ASHRs for the latter two causes and for digestive system diseases were significantly lower among Métis children in the 2011 cohort than among those in the 2006 cohort. No change was detected for mental health-related ASHRs for Métis children between the 2006 and the 2011 cohorts.

Among Métis youth in both cohorts (2011 and 2006), the leading causes of hospitalizations were pregnancy, childbirth and the puerperium; injuries; mental health-related hospitalizations; and digestive system diseases. Pregnancy- and childbirth-related hospitalizations were four times higher in 2006 (RR=4.0) and over three times more prevalent in 2011 (RR=3.4) for Métis youth than for non-Indigenous youth. Mental health-related ASHRs were almost twice higher among Métis youth in the 2006 cohort (RR=1.9). Also, in 2011, ASHRs for endocrine, nutritional and metabolic disease-related conditions were twice as high among Métis youth than among non-Indigenous youth (RR=2.0).

**Figure 2**
**Age-standardized acute-care hospitalization rates per 100,000 population for leading causes, by population group and age group, Canada (excluding Quebec), 2011 cohort**




**Note:** ASHR = age-standardized hospitalization rate.
**Source:** Statistics Canada, 2011 Canadian Census Health and Environment Cohort.

Comparisons of ASHRs across time for Métis youth showed lower ASHRs for pregnancy, childbirth and the puerperium in 2011 than observed in 2006 (ASHRs=1,333 and 2,058, respectively), but that mental health-related hospitalizations increased significantly from the rate in 2006 to that in 2011 (ASHRs=466.9 and 714.9, respectively) representing a 53% increase in hospitalizations for mental health-related conditions.

Non-Indigenous youth experienced a similar pattern in mental health-related hospitalizations, with ASHRs increasing by 73% across the 2006 and the 2011 cohorts.

## Discussion

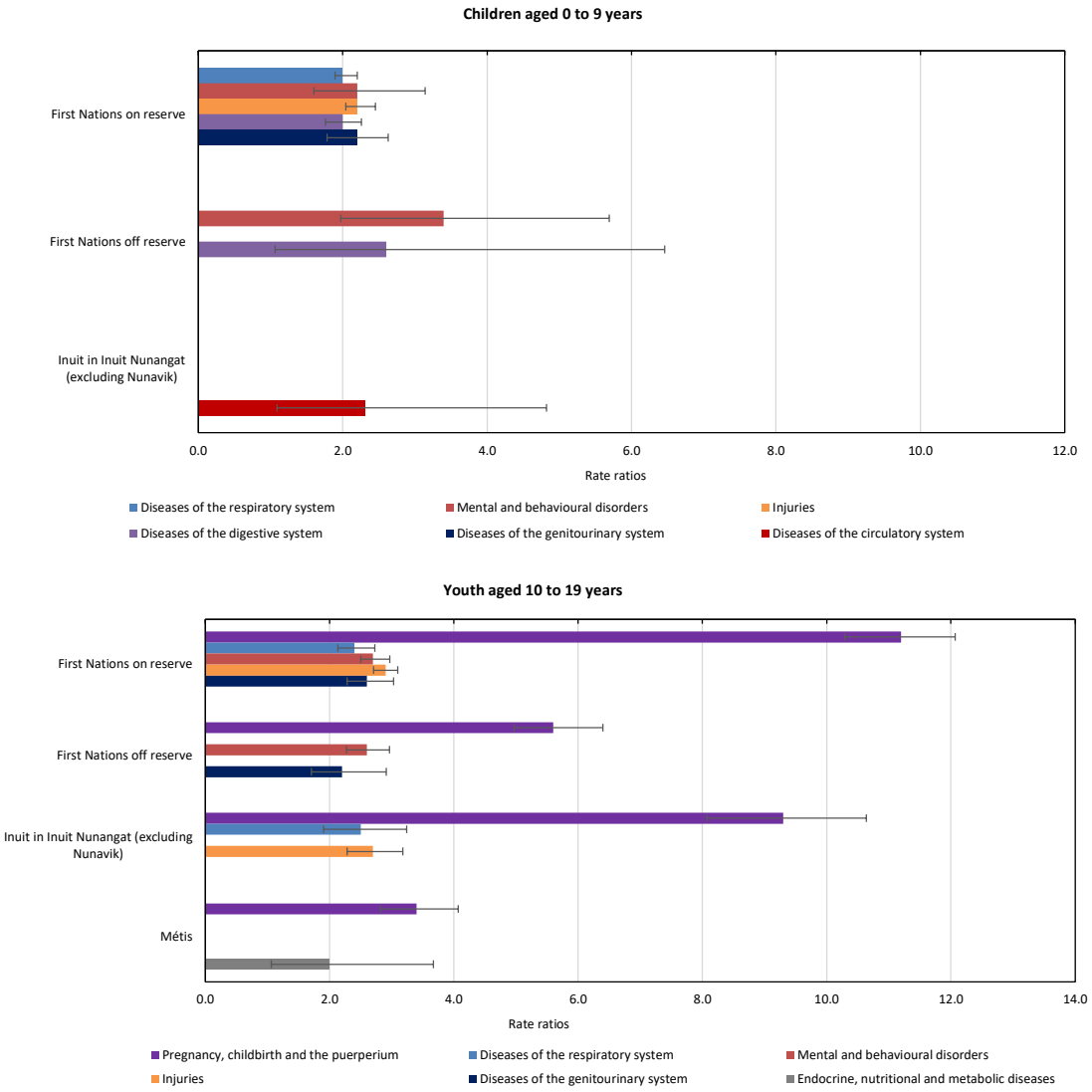
Within each census-year cohort (2006 and 2011), all-cause and some specific-cause hospitalizations varied across Indigenous groups for children and youth relative to non-Indigenous children and youth, generally with higher ASHRs among Indigenous groups. These data provide a means by which differences and changes over time can be evaluated for disproportionate hospitalized morbidity among First Nations, Inuit, Métis and non-Indigenous children and youth in Canada and include more comprehensive coverage of Indigenous populations. This partly addresses information gaps in national health surveys where the on-

reserve population is typically not in scope. The CanCHECs feasibly provide disaggregated information about children and youth to more broadly inform communities, policy makers and program planners.

The observed elevated ASHRs and RRs among Indigenous children and youth in both cohort years align with expectations given previously documented adverse health stemming from the disadvantaged social conditions, including residential schooling, discrimination, and greater physical distance to health services that are experienced disproportionately by Indigenous people. [8,16,18,30] Mistrust,[16] cultural and language differences may disproportionately impede access to care. Results align with what has been previously reported about the disproportionate prevalence among Indigenous people of such impediments to accessing health care and of health determinants that can adversely impact health.[2,8,17,18,31,32,33,34,35] Furthermore, complex shared jurisdictional negotiated responsibilities for health care service delivery are distinct for Indigenous people.[36,37]

While caution is warranted until future trend analyses confirm the direction of the changes to the patterns reported here, this study found that hospitalizations for several types of health conditions (e.g., respiratory diseases) among children and youth in several Indigenous groups were less frequent in 2011 than in 2006. The CanCHECs could feasibly be used in the future to extend this study via multivariate analyses to better clarify underlying factors relating to the observed variation by population group and changes over time. Such analyses were beyond the scope of the present study.

**Figure 3**
**Leading rate ratios for age-standardized acute-care hospitalization rates, by Indigenous group and age group, Canada (excluding Quebec), 2011 cohort**




**Source:** Statistics Canada, 2011 Canadian Census Health and Environment Cohort.

Unlike most other causes of hospitalizations reported here, distinctive increases over time for mental-health-related hospitalizations among youth in nearly all Indigenous groups, and for First Nations children living on reserve are noteworthy, as is the magnitude of the relative disparities (RRs). The disproportionate burden of mental health disorders and suicide among Indigenous peoples has previously been documented,[8,17,38,39] including specifically among children and youth.[6,38] Mental health inequities have been interpreted by others as an indication of imbalances or disconnections owing to the loss of culture, language and identity following an imposition of non-Indigenous ways of being;[8] of burdensome stressors from socioeconomic inequities; and of discrimination that Indigenous peoples disproportionately experience from others.[8,14,38] While this suggests explanations for the differences between the population groups observed here, future research could provide empirical evidence to examine associations between socioeconomic inequities and the risk for increased mental health-related hospitalizations.

These disaggregated results provide new statistically significant information about the changes to hospitalized morbidity over time for Indigenous populations using two comparable cohorts. Furthermore, given the large sample sizes (Appendices B, C), CanCHEC data might be useful for examining more specific mental health diagnoses primarily responsible for increases in mental health-related hospitalizations in 2011. The outstanding need for more diverse representation in mental health data and for more specific, and a broader range of, mental health conditions was indicated following one critical meta-review.[40] These results and data holdings may be useful to partly address these needs.

The significant reductions in respiratory- and injury-related ASHRs for First Nations children and youth living on and off reserve, Métis, and non-Indigenous children across the 2006 and 2011 cohorts also warrant further investigation to better understand whether these patterns represent improved health; increased access to preventative behaviours or services; or, alternatively, a decreased use of hospitals.

There were important limitations to these data. Not all youth mental health records for Ontario were available; therefore, all-cause and mental health hospitalizations for youth were underestimated.[26] Hospital data from Quebec were unavailable to Statistics Canada for linkage. As a result, ASHRs for Indigenous populations who are more likely to receive hospital care in Quebec, particularly among Inuit,[30] are more likely underestimated. Results are based on two independent census cohorts and should not be interpreted as representing changes for an individual from 2006 to 2011. To establish trends, more time points are needed. Since health care delivery is under provincial and territorial jurisdiction, reported patterns may be different if examined by geographic region.[8] Caution is therefore advised if this study's findings are generalized to Indigenous groups in specific geographical regions. As a result of excluding people living in collective dwellings or within incompletely enumerated areas or from non-linkage, the presented rates may have been underestimated, particularly for Indigenous populations.

### Conclusion

Patterns of elevated ASHRs among First Nations children and youth living on and off reserve, Inuit children and youth living within Inuit Nunangat (excluding Nunavik), and Métis children and youth relative to those of non-Indigenous children and youth persisted in 2006 and 2011. Across time, ASHRs for respiratory-related diseases and for injuries among children and youth in most identity groups were lower in 2011 than in 2006, as were the pregnancy- and birth-related ASHRs among youth. In contrast, significant increases to mental health-related hospitalizations occurred for nearly all youth groups and among First Nations children living on reserve warranting further studies to better understand these patterns. Follow-up into the future could evaluate these patterns for emerging trends. This study used a unique data source to examine the hospitalization of Indigenous children and youth, but further research using qualitative and other quantitative studies would help to better understand these health outcomes. Findings from this study could serve as benchmark information against which future patterns could be used to monitor health outcomes and assess whether gaps between populations have widened or diminished for children and youth.

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**Appendix Table A**

**Hospitalizations grouped by International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada, code using most responsible diagnosis**

| Causes of hospitalization | Abbreviation in the text | Codes |
|---|---|---|
| **All causes combined (hospitalizations for childbirth included)** | … | All causes |
| **All causes combined (hospitalizations for childbirth excluded)** | … | All causes excluding any diagnosis code of O10 to O16, O21 to O29, O30 to O46, O48, O60 to O75, O85 to O92, O95 or O98 to O99, with a sixth digit of 1 or 2 coded in any position or Z37 coded in any position |
| **Pregnancy, childbirth and the puerperium** | Pregnancy | Chapter 15 O00-O99 |
| **Diseases of the digestive system** | Digestive | Chapter 11 K00-K93 |
| **Diseases of the respiratory system** | Respiratory | Chapter 10 J00-J99 |
| **Diseases of the circulatory system** | Circulatory | Chapter 9 I00-I99 |
| **Mental and behavioural disorders** | Mental health | Chapter 5 F00-F99 |
| **Endocrine, nutritional and metabolic diseases** | Endocrine | Chapter 4 E00-E90 |
| **Diseases of the genitourinary system** | Genitourinary | Chapter 14 N00-N99 |
| **Diseases of the musculoskeletal system and connective tissue** | Musculoskeletal | Chapter 13 M00-M99 |
| **Injuries** | Injuries | Chapter 19 S00-T98 |

… not applicable

**Source:** Canadian Institute for Health Information. International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada. Ottawa: Canadian Institute for Health Information, 2009.

**Appendix Table B**

**2006 Canadian Census Health and Environment Cohort (no collectives) linked to Discharge Abstract Database (2006/2007 to 2010/2011), by age and population group, Canada (excluding Quebec)**

| | Total (excluding Quebec) | First Nations people living on reserve (excluding Quebec) | First Nations people living off reserve (excluding Quebec) | Inuit living in Inuit Nunangat (excluding Nunavik) | Métis (excluding Quebec) | Non-Indigenous people (excluding Quebec) |
|---|---|---|---|---|---|---|
| | | | number | | | |
| **Children aged 0 to 9 years** | | | | | | |
| **Total cohort** | 529,020 | 41,955 | 14,780 | 6,040 | 12,250 | 447,110 |
| % of total cohort | 100 | 8 | 3 | 1 | 2 | 85 |
| **Sex** | | | | | | |
| Female | 258,030 | 20,415 | 7,330 | 2,960 | 5,930 | 218,000 |
| Male | 270,990 | 21,540 | 7,450 | 3,080 | 6,320 | 229,110 |
| **Jurisdiction** | | | | | | |
| Newfoundland and Labrador | 9,800 | 255 | 290 | 305 | 365 | 8,405 |
| Prince Edward Island | 2,635 | 80 | 35 | 0 | 15 | 2,500 |
| Nova Scotia | 17,750 | 1,580 | 195 | 0 | 170 | 15,785 |
| New Brunswick | 14,460 | 1,230 | 175 | 0 | 85 | 12,960 |
| Ontario | 252,600 | 5,470 | 3,605 | 0 | 1,690 | 239,305 |
| Manitoba | 34,920 | 11,405 | 1,970 | 0 | 2,450 | 18,670 |
| Saskatchewan | 30,895 | 9,835 | 2,715 | 0 | 2,385 | 15,690 |
| Alberta | 78,330 | 7,075 | 2,495 | 0 | 3,125 | 65,395 |
| British Columbia | 76,900 | 5,025 | 2,575 | 0 | 1,535 | 66,410 |
| Yukon | 1,405 | 0 | 325 | 0 | 50 | 775 |
| Northwest Territories | 3,690 | 0 | 385 | 500 | 375 | 865 |
| Nunavut | 5,635 | 0 | 15 | 5,235 | 15 | 350 |
| **Total number of hospitalizations** | 58,705 | 8,650 | 2,410 | 1,170 | 1,800 | 43,405 |
| % of total number of hospitalizations | 100 | 15 | 4 | 2 | 3 | 74 |
| **Youth aged 10 to 19 years** | | | | | | |
| **Total cohort** | 621,750 | 42,895 | 15,180 | 6,065 | 14,825 | 535,720 |
| % of total cohort | 100 | 7 | 2 | 1 | 2 | 86 |
| **Sex** | | | | | | |
| Female | 302,630 | 20,785 | 7,385 | 2,990 | 7,350 | 260,740 |
| Male | 319,120 | 22,110 | 7,795 | 3,075 | 7,470 | 274,980 |
| **Jurisdiction** | | | | | | |
| Newfoundland and Labrador | 12,850 | 230 | 395 | 440 | 465 | 11,050 |
| Prince Edward Island | 3,485 | 80 | 25 | 0 | 10 | 3,365 |
| Nova Scotia | 22,440 | 1,610 | 280 | 0 | 225 | 20,285 |
| New Brunswick | 17,865 | 1,245 | 190 | 0 | 95 | 16,310 |
| Ontario | 298,570 | 5,725 | 3,925 | 0 | 2,430 | 284,285 |
| Manitoba | 38,780 | 11,120 | 1,925 | 0 | 2,770 | 22,620 |
| Saskatchewan | 35,275 | 10,000 | 2,380 | 0 | 2,660 | 19,985 |
| Alberta | 86,230 | 6,985 | 2,425 | 0 | 3,565 | 72,950 |
| British Columbia | 95,090 | 5,895 | 2,775 | 0 | 2,085 | 82,745 |
| Yukon | 1,655 | 0 | 355 | 0 | 45 | 965 |
| Northwest Territories | 4,205 | 0 | 490 | 640 | 470 | 875 |
| Nunavut | 5,310 | 0 | 15 | 4,990 | 15 | 285 |
| **Total number of hospitalizations** | 115,510 | 24,220 | 5,600 | 2,940 | 4,515 | 75,155 |
| % of total number of hospitalizations | 100 | 21 | 5 | 3 | 4 | 65 |

**Notes:** Discharge Abstract Database (DAD) data from Quebec were unavailable for linkage. To make the 2006 Canadian Census Health and Environment Cohort (CanCHEC) comparable with the 2011 CanCHEC, only census subdivisions that were considered to be reserves in 2006 and 2011 were classified as "on reserve." Collective dwellings were excluded from the 2006 CanCHEC to make it comparable with the 2011 CanCHEC. Collective dwellings refer to dwellings of a commercial, institutional or communal nature. Collective dwellings include rooming or lodging houses, hotels, motels, tourist homes, nursing homes, hospitals, staff residences, communal quarters of military camps, work camps, jails, missions and group homes. Collective dwellings may be occupied by usual residents or solely by foreign or temporary residents. In the 2006 CanCHEC, 2006 Census data are linked to 2006/2007 to 2010/2011 DAD records.

**Source:** Statistics Canada, 2006 Canadian Census Health and Environment Cohort.

**Appendix Table C**

**2011 Canadian Census Health and Environment Cohort linked to Discharge Abstract Database (2011/2012 to 2015/2016), by age and population group, Canada (excluding Quebec)**

| | Total (excluding Quebec) | First Nations people living on reserve (excluding Quebec) | First Nations people living off reserve (excluding Quebec) | Inuit living in Inuit Nunangat (excluding Nunavik) | Métis (excluding Quebec) | Non-Indigenous people (excluding Quebec) |
|---|---|---|---|---|---|---|
| | | | number | | | |
| **Children aged 0 to 9 years** | | | | | | |
| **Total cohort** | 571,960 | 42,845 | 17,230 | 5,245 | 12,215 | 490,705 |
| % of total cohort | 100 | 7 | 3 | 1 | 2 | 86 |
| **Sex** | | | | | | |
| Female | 279,335 | 20,935 | 8,560 | 2,550 | 5,940 | 239,520 |
| Male | 292,625 | 21,910 | 8,670 | 2,690 | 6,275 | 251,185 |
| **Jurisdiction** | | | | | | |
| Newfoundland and Labrador | 9,280 | 350 | 355 | 335 | 335 | 7,520 |
| Prince Edward Island | 2,570 | 85 | 35 | 0 | 10 | 2,435 |
| Nova Scotia | 17,325 | 1,745 | 320 | 0 | 190 | 15,010 |
| New Brunswick | 14,145 | 1,100 | 225 | 0 | 95 | 12,690 |
| Ontario | 270,105 | 5,000 | 4,535 | 0 | 1,875 | 257,555 |
| Manitoba | 36,355 | 11,700 | 1,955 | 0 | 2,240 | 20,360 |
| Saskatchewan | 29,945 | 9,555 | 1,930 | 0 | 1,890 | 16,465 |
| Alberta | 93,940 | 8,270 | 2,575 | 0 | 3,400 | 79,280 |
| British Columbia | 89,070 | 5,040 | 3,280 | 0 | 1,840 | 77,580 |
| Yukon | 1,060 | 0 | 415 | 0 | 30 | 600 |
| Northwest Territories | 3,410 | 0 | 1,590 | 470 | 310 | 920 |
| Nunavut | 4,750 | 0 | 20 | 4,435 | 10 | 285 |
| **Total number of hospitalizations** | 57,175 | 7,800 | 2,310 | 980 | 1,380 | 44,140 |
| % of total number of hospitalizations | 100 | 14 | 4 | 2 | 2 | 77 |
| **Youth aged 10 to 19 years** | | | | | | |
| **Total cohort** | 626,760 | 39,675 | 18,065 | 4,540 | 14,530 | 546,110 |
| % of total cohort | 100 | 6 | 3 | 1 | 2 | 87 |
| **Sex** | | | | | | |
| Female | 305,300 | 19,290 | 8,910 | 2,210 | 7,035 | 265,995 |
| Male | 321,465 | 20,385 | 9,155 | 2,330 | 7,495 | 280,115 |
| **Jurisdiction** | | | | | | |
| Newfoundland and Labrador | 10,500 | 295 | 505 | 340 | 405 | 8,565 |
| Prince Edward Island | 3,085 | 65 | 30 | 0 | 20 | 2,965 |
| Nova Scotia | 20,080 | 1,705 | 395 | 0 | 280 | 17,635 |
| New Brunswick | 16,365 | 1,130 | 310 | 0 | 135 | 14,755 |
| Ontario | 306,905 | 4,935 | 5,035 | 0 | 2,545 | 293,230 |
| Manitoba | 37,760 | 10,165 | 1,860 | 0 | 2,570 | 23,045 |
| Saskatchewan | 29,895 | 8,435 | 1,830 | 0 | 2,040 | 17,495 |
| Alberta | 91,200 | 7,585 | 2,375 | 0 | 3,760 | 77,045 |
| British Columbia | 102,525 | 5,355 | 3,630 | 0 | 2,370 | 89,800 |
| Yukon | 1,065 | 0 | 430 | 0 | 40 | 580 |
| Northwest Territories | 3,425 | 0 | 1,655 | 435 | 350 | 830 |
| Nunavut | 3,965 | 0 | 15 | 3,770 | 10 | 170 |
| **Total number of hospitalizations** | 105,275 | 19,980 | 5,730 | 2,230 | 3,610 | 72,450 |
| % of total number of hospitalizations | 100 | 19 | 5 | 2 | 3 | 69 |

**Notes:** Discharge Abstract Database (DAD) data from Quebec were unavailable for linkage. To make the 2006 Canadian Census Health and Environment Cohort (CanCHEC) comparable with the 2011 CanCHEC, only census subdivisions that were considered to be reserves in 2006 and 2011 were classified as "on reserve." In the 2011 CanCHEC, 2011 National Household Survey data are linked to 2011/2012 to 2015/2016 DAD records.

**Source:** Statistics Canada, 2011 Canadian Census Health and Environment Cohort.

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