**Appendix 1. Study variables**

**Table A1
Study variables available from Data Repositories in Ontario, Manitoba and BC**

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| **Variable** | **Definition**  |
| **Special health needs (SHN)** | A child will be identified as having SHN if they meet any of the following 3 criteria, as reported on the EDI: 1. School-district determined special needs designation;
2. Teacher-reported functional impairment (one or more of: physical disability, visual impairment, hearing impairment, speech impairment, learning disability, emotional problem, behavioural problem);
3. Teacher-reported need for further assessment.
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| **Child development in kindergarten** | Child development will be assessed through scores on 5 developmental domains on the EDI: physical health and well-being, social competence, emotional maturity, language and cognitive development, and communication skills and general knowledge. |
| **Mental disorder**(note: prior to ICD-10, DSM codes translated directly to ICD codes) | Any mental disorder:* One or more hospitalizations with a diagnosis for any mental disorder, encompassing codes ICD-9 290-319 and ICD-10 F01-F99
* Two or more physician visits with a diagnosis for any mental disorder, encompassing codes ICD-9 290-319 and ICD-10 F01-F99
* Corresponding DSM descriptions or diagnoses of any mental health disorder

Depression: * One or more hospitalizations with a diagnosis for mood or depressive disorder, affective psychoses, neurotic depression, or bipolar disorder: ICD-9-CM/DSM codes 296, 311 or ICD-10-CA codes F30, F31, F32, F33, F34, F38, F53.0; OR
* Two or more physician visits with a diagnosis for depressive disorder or affective psychoses, adjustment reaction): ICD-9-CM/DSM codes 296, 311.
* Corresponding DSM descriptions or diagnoses: Major depressive disorder, persistent depressive disorder (dysthymia), cyclothymic disorder, disruptive mood dysregulation disorder, bipolar I disorder, bipolar II disorder, other specified depressive disorder

Anxiety: * One or more hospitalizations with a diagnosis for an anxiety state, adjustment reaction, phobic disorders or obsessive-compulsive disorders: ICD-9-CM/DSM code 300, 309 or ICD-10-CA codes: F40, F41.0, F41.1, F41.2, F41.3, F41.8, F41.9, F42, F43; OR
* Two or more physician visits with a diagnosis for anxiety disorders (including dissociative and somatoform disorders): ICD-9-CM/DSM codes: 300, 309.
* Corresponding DSM descriptions or diagnoses: Generalized anxiety disorder, acute stress disorder, panic disorder, persistent depressive disorder (dysthymia), adjustment disorder, posttraumatic stress disorder, separation anxiety disorder, other specified/unspecified trauma- and stressor-related disorders, body dysmorphic disorder, conversion disorder (functional neurological symptom disorder), somatic symptom disorder, other specified/unspecified somatic symptom and related disorders, depersonalization/derealization disorder, dissociative amnesia, dissociative identity disorder, other specified/unspecified dissociative disorders, factitious disorder, illness anxiety disorder, social anxiety disorder (social phobia), other specified/unspecified anxiety disorders, agoraphobia, other specific phobias, hoarding disorder, obsessive-compulsive disorder, other specified/unspecified obsessive-compulsive and related disorders, other specified/unspecified mental disorders

ADHD:* 1+ hospitalizations with diagnosis of hyperkinetic syndrome (ICD‐9‐CM code 314 or ICD‐10 code F90) in one fiscal year; OR
* 1+ physician claims with diagnosis of hyperkinetic syndrome (ICD‐9‐CM code 314) in one fiscal year; OR
* 2+ Rx for ADHD drugs in one fiscal year without a diagnosis in the same fiscal year of cataplexy/narcolepsy (347/G47.4); OR
* 1 Rx for ADHD drugs in one fiscal year with diagnosis of hyperkinetic syndrome (ICD‐9‐CM code 314 or ICD‐10 code F90) in the previous 3 years.
* Corresponding DSM descriptions or diagnoses: Attention-deficit/hyperactivity disorder, other specified/unspecified attention-deficit/hyperactivity disorders

Conduct disorders:* One or more hospitalizations with diagnosis of conduct disorders (ICD-9/DSM: 312), oppositional defiant disorder (ICD-9/DSM: 313) or ICD‐10: F91 (all F91 codes); OR
* One or more physician visits with a diagnosis of conduct disorders (ICD-9/DSM: 312, ICD-10: all F91 codes) or oppositional defiant disorder (ICD-9/DSM: 313 or ICD-10: F91.3).
* Corresponding DSM descriptions or diagnoses: Conduct disorder, kleptomania, gambling disorder, pyromania, intermittent explosive disorder, trichotillomania (hair-pulling disorder), other specified/unspecified disruptive, impulse-control, and conduct disorders, oppositional defiant disorder, reactive attachment disorder, selective mutism, disinhibited social engagement disorder
 |
| **Child’s sex** | Biological sex (male/female) |
| **Child’s age** | Date of birth |
| **Neighbourhood SES** | In order to make the results comparable across provinces, we will use the Canadian Neighbourhood and Early Child Development (CanNECD) SES Index, which has been matched to children’s postal codes across all of Canada and is part of the EDI database. |
| **Family SES** | This variable will be derived fromCensus-based dissemination area-level income data based on the child’s residence in kindergarten. For sensitivity analyses, we will use a different variable in each of the 3 provincial datasets that is indicative of low income/poverty: * in Manitoba, a receipt of Manitoba Employment and Income Assistance (a family-level variable). It is a monetary support allocated by the provincial government to individuals and their dependents who meet a standard financial need test that qualifies them for benefits. The total financial resources of the household are compared to the total cost of basic necessities including food, clothing, personal needs and household supplies, some medical costs, housing.
* in BC, a receipt of the health insurance financial subsidy (a family-level variable). Families with a low household income (cut-off increased from $19,000 in 1993 to $28,000 in 2005) qualify for Medical Service Plan (MSP) payment subsidies from the Ministry of Health.
* in Ontario, evidence of Ontario Drug Benefit (ODB) claims. The ODB claims cover both over-the-counter and prescription medications under the social assistance program Ontario Works (mother or child). Qualification for Ontario Works is based on financial circumstances assessed by government similarly to the formula described above for Manitoba.

All these variables are binary and available in the linked datasets.  |
| **Geography (urban/rural)** | Urban and rural areas will be designated according to the neighbourhood definitions developed as part of the CanNECD study. Each CanNECD neighbourhood has been designed as either rural, urban, or a mix of both, based on a combination of population size, density, and census metropolitan area/census agglomeration status (Forer et al., 2019). |
| **Maternal/child health** | Birth weight, gestational age, presence of complex chronic conditions or congenital anomalies, especially neurological ones using previously validated definitions, or a history of significant prenatal exposures including opioids and illicit substances (using neonatal abstinence syndrome and other diagnostic codes on the infants’ birth records); mother’s age at delivery. |
| **Immigrant status** | Information on age of arrival, generational status (1st and 2nd generation), country of origin, migration class (economic, family, refugee), and recency (<5 years preceding the birth of the child, between 5 and 10 years, and over 10 years). |
| **Usual provider of primary care** | Patients are allocated to their usual provider using the following algorithm: * The patient is allocated to the provider with whom they had the most visits; in the event of a tie, providers with fewer visits with that patient are eliminated and the next step is performed with the remaining providers;
* The patient is allocated to the provider with the highest total billings; in the event of a tie, providers with lower total billings with that patient are eliminated from this process and the next step is performed with the remaining providers;
* The patient is allocated to one of the remaining primary care providers at random.
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| **Continuity of care** | The Continuity of Care Index takes into account both the frequency of ambulatory visits to primary care providers and the dispersion of visit among different primary care providers. Index values range from 0-1, with lower values indicating that visits are made to different providers, and higher values indicating that visits are made to a single provider. |
| **ADHD**: Attention Deficit-Hyperactivity Disorder; **CanNECD**: Canadian Neighbourhood and Early Child Development; **EDI**: Early Development Instrument; **ICD**: International Classification of Disease; **SES**: socioeconomic status; **SHN**: special health needs.  |

**References**
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Forer B, Minh A, Enns J, et al. 2019. A Canadian neighbourhood index for socioeconomic status associated with early child development. *Child Ind Res*. 2019. doi:10.1007/s12187-019-09666-y