

Supplementary Online Content

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eTable. Swedish National Registers Used in the Study and the Personal Identity Number

eMethods. Exposure and Other Variables

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable. Swedish National Registers Used in the Study and the Personal Identity Number¹².

Register	Description
The Swedish Register of the Total Population (TPR)	Held by the government agency of Statistics Sweden and updates are transmitted daily from the Tax Agency to the TPR. It contains the personal identity number for all Swedish residents and information on for example country of birth, date of death and migration.
The Multi-Generation register	A special register based on the TPR. It contains data on all residents born after 1932 and any relationship to biological and adoptive parents
The Migration register	A special register based on the TPR which contains dates of immigration and migration.
The Longitudinal Integration Database for Health Insurance and Labour Market Studies	Held by the government agency of Statistics Sweden and integrates existing data from the labour market, educational and social sectors registers. It is updated annually and includes an extensive set of socio-economic factors for all Swedish residents 16 years of age.
The Medical Birth Register	Held by the Swedish National Board of Health and Welfare. It is compulsory for every health care provider in Sweden to report to the register and it includes data on practically all deliveries in Sweden. Only 0.5-3.0 per cent of the deliveries are not reported to the register. The information is collected from medical records from the prenatal, delivery and neonatal care.
Swedish Prescribed Drug Register	Held by the Swedish National Board of Health and Welfare. It contains information on all dispensed prescribed drugs at pharmacies in Sweden since July 2005 using the Anatomical Therapeutic Chemical (ATC) classification system.
National Patient Register	Held by the Swedish National Board of Health and Welfare. It contains information on all inpatient diagnoses since 1987 and specialist outpatient diagnoses since 2001.
<p>The personal identity number (PIN) is a unique identifier and consist of a six-digit birth date and a four-digit identification number. The PIN is used in all public administration in Sweden and enables unambiguous linkage between the Swedish registers. At birth, the midwife or the hospital are obliged to report the birth to the National Tax Board and the child will be given a PIN. It is estimated that <0.1 % of newborns are not reported to the Population Registers within 30 days.</p>	

eMethods. Exposure and Other Variables

Exposure

Since 2001, all dogs in Sweden are required by law to carry a subcutaneous id-chip or an ear tattoo for identification and to be registered, together with the owner's personal identity number, in the national dog register held by the Swedish Board of Agriculture. It is also mandatory to report a change in ownership and the date when the dog dies. The registration should be done before the dog is 4 months of age and a change in ownership reported within 4 weeks. The Swedish Kennel Club dog register, in which Swedish pure-bred dogs are registered, holds complete ownership details including the owner's personal identity number since 2001. It has been estimated that 83% (95% CI, 78%-87%) of pet dogs were registered in at least one of these registers in Sweden in 2012.¹ We have previously used these registers to show an inverse association of dog and farm contact with childhood asthma.²

We assumed that a parent was a dog owner from the date of dog registration until a reported change in ownership or the death of the dog. If no death date for the dog was reported, we assumed a maximum age of 10 years. It has been estimated that 68 % of insured Swedish dogs are surviving to an age of 10 years³. If both birth date and death date were missing (3.8% (13 243) of 347 504 dogs)) we assumed that the dog died 10 years after first registration² Assuming that the maximum age of a dog was 8 or 12 years instead of 10 years changed the classification from non-exposed to dog-exposed children for 4163 and 2002 children. We excluded children of parents registered as dog owners only during part of the child's first year.

Dog exposure was categorized as at least one dog ($0, \geq 1$ dog) and as the number of dogs ($0, 1, 2, \geq 3$). We also had information about the breed and we used the Swedish kennel clubs definition of breed groups and categorized the dogs into the following 11 groups. Group 1: Sheepdogs and Cattle dogs, Group 2: Pinschers, Schnauzer, Molossoid, Swiss Mountain and Cattle dogs, Group 3: Terriers, Group 4: Dachshunds, Group 5: Spitz and primitive types, Group 6: Scent hounds and related breeds, Group 7: Pointing Dogs, Group 8: Retrievers, Flushing Dogs and Water Dogs, Group 9: Companion and Toy Dogs, Group 10: Sighthounds and Group 11: Mixed.

The height of a registered dog was estimated by the midpoint of the height interval in the breed standard for males and females respectively. The breed standards were provided by the Swedish Kennel Club.

We defined farm animal exposure as having a parent identified in the Longitudinal Integration Database for Health Insurance and Labour Market Studies (LISA) as "animal producer and related worker, SSYK6121" in the year the child was born. The SSYK6121 code is derived from the Agriculture Business Register held by the National Board of Agriculture, which is based on surveys of all owners to farming business operations. Most (78%) of the farm labour constitutes the owner or the owner's family.⁴ Cattle and sheep are the most common animal types.

Other variables

Variables that previously have been suggested to be associated with type 1 diabetes risk and that we think could be associated with animal exposure include: mother's age⁵, maternal and paternal type 1 diabetes⁶, parity⁵, household income⁷, mother's and father's education⁶, mother's and father's country of birth⁸, other animals (dog/farm animal), population density⁹, geographic location¹⁰, mother's smoking⁶ and mother's BMI¹¹.

Information on the following potential confounding variables was collected from the Medical Birth Register: child's birth year, sex, parity, mode of delivery, maternal smoking at first visit to the antenatal care clinic, maternal age at delivery. The child's residence at the year of birth (parish), disposable household income the year before birth and the highest level of education of either parent was retrieved from Longitudinal Integration Database for Health Insurance and Labour Market Studies. Household income was adjusted for family size and categorized into fifths by calendar year. For children where only one parent's education was known the other was imputed to the value of the other parent. The population density (inhabitants per km²) for each municipality was provided by Statistics Sweden.

Parents were classed as having type 1 diabetes if they had a type 1 diabetes diagnosis (ICD-10: E10, O240, ICD-9: 250, ICD-8:250, ICD-7:260) in the NPR or at least one prescription of insulin (ATC: A10A) according to the SPDR, not due to gestational diabetes, before the age of 30. Mothers were classed as having gestational diabetes if they had a gestational diabetes diagnosis (ICD-10:O244) in the NPR or the MBR. The ICD-7, 8 and 9 do not include specific codes for type 1 and type 2 diabetes and therefore we classified parents as having type 1 diabetes only if they were diagnosed before age 30 years.

eReferences

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eFigure. Directed Acyclic Graph

