



## NEWS RELEASE

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### **Falling childhood asthma rates linked to declining use of unnecessary antibiotics**

VANCOUVER – A recently released study shows asthma rates are falling thanks to efforts by physicians to avoid prescribing antibiotics to young children, except when necessary. The study also shows that being prescribed antibiotics within the first 12 months of life is associated with almost double the risk of being diagnosed with asthma by age of five.

Using population-level data from the 4.7 million people living in the Canadian province of British Columbia, combined with individual-level data from 2,644 Canadian children, researchers found that every 10 percent increase in the prescribing of antibiotics was linked with a 24 percent increase in asthma incidence.

The study, published in *The Lancet Respiratory Medicine*, suggests that careful antibiotic use in children under the age of one is important to help preserve the diversity and abundance of healthy gut bacteria, making children less susceptible to developing asthma later in life.

“After decades of rising rates of asthma in Canadian kids, that trend is finally reversing,” said lead author Dr. Stuart Turvey, a pediatric immunologist and investigator at BC Children’s Hospital, Aubrey J. Tingle professor of pediatric immunology, Canada Research Chair in Pediatric Precision Health and professor in The University of British Columbia (UBC) department of pediatrics. “This research points to the powerful role ‘good’ bacteria play in health and disease, and takes us a step closer to our goal of finding a way to identify babies at risk for asthma and to develop new treatments that would prevent the development of this chronic disease.”

The study, conducted by researchers from BC Children’s Hospital, the BC Centre for Disease Control (BCCDC) and UBC, examined population-level data on childhood asthma and antibiotic use in British Columbia and evidence from individual children about what happens to microbes in a child’s gut when antibiotics are prescribed.

The findings support efforts to use antimicrobial drugs like antibiotics more carefully and appropriately to preserve their effectiveness and prevent antibiotic resistance. For example, among the kids who received antibiotics before their first birthday and developed asthma by age five, researchers found their gut bacteria were less diverse overall. Significantly, they lacked several key bacteria whose absence is known to impact the overall functioning of the immune system and has been previously linked with a higher risk of developing asthma.

Currently, asthma affects eight percent of Canadian children and costs the healthcare system more than \$2 billion each year. While asthma diagnoses among Canadian kids tripled in the last half of the 20th century, incidence of the disease and associated hospitalizations are now declining.

“The threat of antibiotic resistance was already reason enough to reduce unnecessary antibiotic use,” said first author Dr. David Patrick, interim executive lead for BCCDC and medical lead of the antimicrobial resistance program. “This research suggests that declining use is doing more than slowing down antibiotic resistance, preventing drug reactions and reducing costs. It also appears to reduce the risk of asthma – childhood’s most common chronic disease. With antimicrobial resistance a worldwide health and economic threat, findings like this reinforce efforts to use antibiotics more carefully.”

“Good bacteria play a vital role in childhood health and development,” said co-author Dr. B. Brett Finlay, Peter Wall Distinguished Professor in the Michael Smith Laboratories and the departments of microbiology and immunology and of biochemistry and molecular biology at UBC. “As this research shows, nurturing a diverse and robust microbiome, which entails the prudent use of antibiotics, can play a key role in the healthy development of a child’s immune system and lead to life-long benefits.”

Study participants were recruited as part of the CHILD Cohort Study launched in 2008 by the Canadian Institutes of Health Research (CIHR) and the Allergy, Genes and Environment Network (AllerGen NCE). Since 2008, CHILD investigators have tracked the health, growth and environments of nearly 3,500 children across Canada from birth and made important discoveries about how asthma and allergies develop.

“Thanks to the participation and dedication of our CHILD families, we had access to a rich collection of genetic, biological and environmental data,” said Dr. Hind Sbihi, study co-author and UBC postdoctoral fellow. “It allowed us to show that this population-level connection between declining antibiotic use and asthma diagnoses is happening at the individual level and helps to pinpoint the role that healthy gut bacteria play in the development of a baby’s immune system and the prevention of immune-mediated diseases like asthma.”

Previous research from UBC and CHILD has shown that [children who are missing four types of gut bacteria at three months of age are more likely to develop asthma](#). Other CHILD studies have identified the protective effects of a [vaginal delivery](#) and [direct breastfeeding](#) in promoting a healthy gut microbiome to reduce the risk of asthma.

Dr. Turvey is co-director of the CHILD Cohort Study and the Vancouver study site lead.

Dr. Patrick led the population level evaluation at BCCDC. Population-level data for this study was provided by BC PharmaNet and the BC Ministry of Health Chronic Disease Registry.

Funders include the BC Ministry of Health, Pharmaceutical Services Branch; CIHR; AllerGen NCE; Genome Canada; Genome BC; BC Children’s Hospital Foundation and other project co-funding partners. The CHILD Cohort Study is supported by AllerGen NCE, CIHR, Health Canada, Environment Canada, Canada Mortgage and Housing Corporation, and the Childhood Asthma Foundation.

#### **Learn More:**

[https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30052-7/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30052-7/fulltext)

**BC Children’s Hospital**, a program of the Provincial Health Services Authority provides expert care for the province’s most seriously ill or injured children, youth and young adults, including newborns. Child and Youth Mental Health provides a diverse range of specialized and one-of-a-kind tertiary mental health and substance use services for children, adolescents and young adults across the province. For more information, visit [www.bcchildrens.ca](http://www.bcchildrens.ca) or follow us on Twitter [@BCChildrensHosp](https://twitter.com/BCChildrensHosp).

**The BC Centre for Disease Control**, a part of the Provincial Health Services Authority, provides public health leadership through surveillance, detection, treatment, prevention and consultation services. The Centre provides diagnostic and treatment services for people with diseases of public health importance, and analytical and policy support to all levels of government and health authorities. The BCCDC also provides health promotion and prevention services to reduce the burden of chronic disease, preventable injury and environmental health risks. For more, visit [www.bccdc.ca](http://www.bccdc.ca) or follow us on Twitter [@CDCofBC](https://twitter.com/CDCofBC).

**The University of British Columbia** is a global centre for research and teaching, consistently ranked among the top 20 public universities in the world. Since 1915, UBC's entrepreneurial spirit has embraced innovation and challenged the status quo. UBC encourages its students, staff and faculty to challenge convention, lead discovery and explore new ways of learning. At UBC, bold thinking is given a place to develop into ideas that can change the world.

The **Provincial Health Services Authority (PHSA)** plans, manages and evaluates selected specialty and province-wide health care services across BC, working with the five geographic health authorities to deliver province-wide solutions that improve the health of British Columbians. For more information, visit [www.phsa.ca](http://www.phsa.ca) or follow us on Twitter [@PHSAofBC](https://twitter.com/PHSAofBC).

**The CHILD Cohort Study** is tracking nearly 3,500 Canadian infants and their families to help determine the root causes of chronic diseases such as asthma, allergies and obesity. Launched in 2008 by CIHR and AllerGen NCE, CHILD spans four provinces, involving over 140 multidisciplinary researchers, students and research staff. [Watch the CHILD Cohort Study videos.](#)

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