

The Hygiene Hypothesis Explained Backgrounder

The Hygiene Hypothesis: Consensus Statement from the Hygiene Council

The Hygiene Council has reviewed the evidence and concludes that there is no scientific evidence to support the Hygiene Hypothesis. The practice of increased hygiene such as hand washing and surface disinfection has been scientifically shown to reduce infection and decrease levels of illness and mortality and does not correlate with any increase in atopic (allergic) diseases.

While it is recognised that some exposure to microbes is an important step in the process of 'natural immunization', exposure to harmful pathogens that can cause disease is unnecessary and preventable. Based on this reasoning, the Hygiene Council agrees that the term 'Microbial Deprivation Hypothesis' would be a better description of the theory currently known as the 'Hygiene Hypothesis'.

The practice of good hygiene and targeted disinfection is critical with regards to disease prevention; it can truly be said that 'an ounce of prevention is worth a pound of cure'.

What is the Hygiene Hypothesis?

The 'Hygiene Hypothesis' was first proposed by Strachan in 1989¹ and suggested that the recent rise in atopic (allergic) diseases, such as asthma and eczema, was caused by a lower incidence of infections in early childhood resulting from the trend towards smaller family size where unhygienic contact with older siblings was less. Subsequently the concept was broadened to suggest that the increase in allergic diseases and infections resulted from the decline in microbial exposure.

A popular view is that we currently undertake more rigorous cleaning and hygiene practices due to our fear of germs and a desire for an aesthetically pleasing dirt-free environment. In turn, it is believed that this reduces our exposure to bacteria and microbes, which are required for the development of a balanced immune system, and has led to an increased incidence of autoimmune diseases. Infectious disease specialists have recently begun to intervene in the debate, due to concern that the concept of being 'too clean' will have or may already be having a detrimental impact on society.²

Do studies support a link between an increase in hygiene practices and incidence of illness?

Many studies have been conducted in order to establish if our desire for cleanliness has had a negative impact on our health. A recent comparison of soap and detergent consumption with the prevalence of atopic disease showed there was no evidence of a relationship³ and a further study looking into the consumption of soap, detergents and cleaning products, again showed no correlation against reported prevalence of asthma, hay fever and eczema and consumption of cleaning products.⁴ The link between an increase in hygiene practices and incidence of illness is not strongly supported by scientific data.

Why is good hygiene important?

Although there are beneficial effects which exposure to some infections have on the development of our immune system, exposure to pathogenic microbes can still be very harmful to us and is both preventable and unnecessary. The concept of 'targeted' cleaning and/or disinfection, focusing on those areas known to represent the greatest risk, means that we will lower our potential exposure to hazardous pathogens but not to general microbes in the environment.

A review of studies by Beumer et al (2002)⁵ showed that despite the clean appearance of our modern home environments, there are constant opportunities for microbial exposure. Pathogenic and environmental microbial species are all continually introduced to the home by people, water, food, pets and the air, and such organisms are readily spread via hands, cleaning cloths and contact surfaces around the home. These pathogenic microbes can cause illness and disease if they are not dealt with effectively and correct hygiene practices are not in place.

Do we need to make changes to our hygienic behaviours?

When people clean their homes, speed and aesthetic factors have become more important than hygiene and disease prevention. In addition, visual observation is generally used to decide when cleanliness has 'been achieved', and the assumption that 'visibly clean' means 'free from microbes' is a misconception. Evidence from a number of observational studies suggests that compliance with hygiene practices that specifically protect us from pathogen exposure is relatively poor,^{6,7,8} which indicates that changes in hygienic practices are needed.

What is the view of the Hygiene Council?

The evidence suggests that many micro-organisms may be found in our homes, and that some of these may be pathogenic and detrimental to our health. Although the Hygiene Council does not suggest that

homes should be completely germ-free, it recommends that greater attention to cleaning and targeted disinfection of areas around the home that represent high risk, such as kitchen surfaces, kitchen cloths and hand contact points. It is also important that hand washing at key times should be employed to minimise the risk of cross contamination and infection.

What does the Hygiene Council Recommend?

The Council has formulated a set of practical guidelines aimed at increasing world hygiene standards, both in the home and in the community. The Hygiene Standards focus on the key hygiene behaviours required to keep you and your family healthy. For details on the when, how and why of hand washing, surface disinfection, food preparation & storage and laundry care please visit the Hygiene Council website (hygienecouncil.com).

¹ Strachan DP. Hay fever, hygiene and household size. *Br. Med J* 1989; **299**:1259-60.

² Bloomfield SF, Stanwell-Smith R, Crevel RW, Pickup J. Too clean, or not too clean: the hygiene hypothesis and home hygiene. *Clin Exp Allergy* 2006;**36**(4):402–425.

³ Pickup J. Trends in home and consumer hygiene. In: Stanwell Smith R, ed. 'Are we too clean? – a question of immunity balance'. RIPH Symposium Report. London: Royal Institute of Public Health 2003; 6-7 (Published as a supplement to Health & Hygiene).

⁴ Beasley R, Keil U, von Mutius E, Pearce N. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC. *Lancet* 1988;**351**:1225-32.

⁵ Beumer R, Bloomfield SF, Exner M, Fara GM, Nath KJ, Scott E. The infection potential in the domestic setting and the role of hygiene practice in reducing infection. International Scientific Forum on Home Hygiene: <http://www.ifh-homehygiene.org/2public/INF POT2.pdf,2002>.

⁶ Aiello AE, Larson EL. What is the evidence for a causal link between hygiene and infections? *Lancet Infectious Diseases* 2002;**1**:103-10.

⁷ Griffith c, Worsfold D, Mitchell R. Food preparation, risk communication and the consumer. *Food Control* 1998;**9**:225032.

⁸ Curtis V, Biran A, Deverell K, Jughes C, Bellamy K, Drasar B. Hygiene in the Home: Relating bugs and behaviour. *Social Science Medicine* 2003;**57**:657-72.