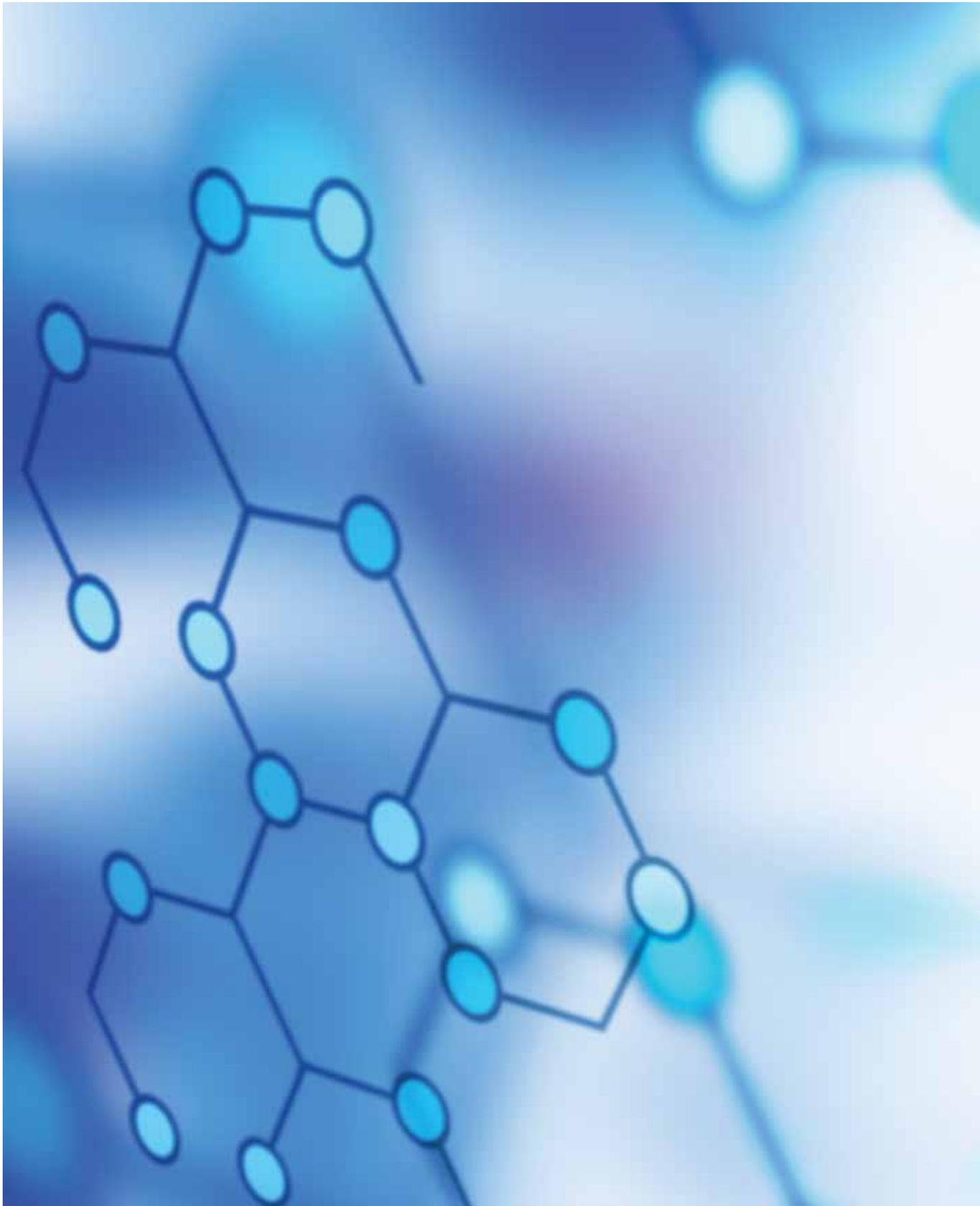




# Common Misconceptions About Bleach & Asthma



# Your Defense Against the Toughest Healthcare Pathogens

## What is asthma?

Asthma is a chronic inflammatory disease of the lungs; symptoms include:

- Cough
- Wheeze
- Shortness of breath
- Feeling of tightening in the chest
- Reduced Forced Expiratory Volume (FEV) levels
- Antibody formation over time (sensitization)
- Reversible airflow obstructions

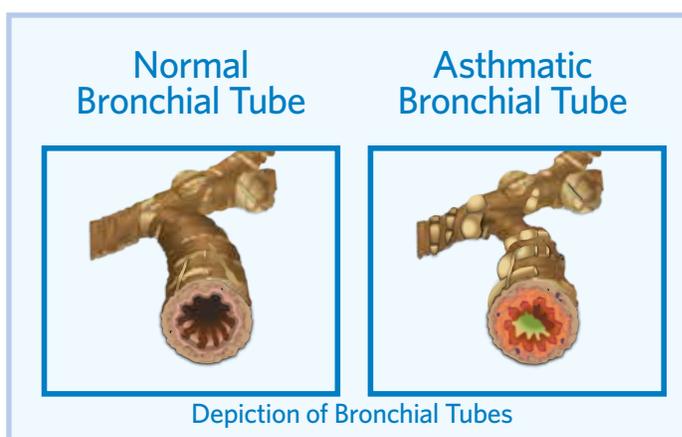
The prevalence of asthma in Canada is approximately 8% of the total population, or 8 million people.<sup>1</sup>

Asthma is often induced by inhalation of an antigen, which begins a chain of immunological events leading up to asthmatic symptoms. Common allergens include dust mites, pet dander, plant pollens, household dust and moulds. Some individuals will have asthma-like symptoms from common everyday activities and situations such as emotional stress, cold weather, inhaled irritants or exercise.

## What is an allergy?

An allergy is a small protein that triggers an immune response; for example, pet dander. Over time, the immune system identifies the inhaled dander as an invader and develops antibodies called Immunoglobulin E (IgE). When an individual is exposed to the allergen, these antibodies bind to the small protein and carry it to other immune cells, which release chemicals. One of these chemicals is called histamine, and it is responsible for many of the symptoms that asthmatics experience, such as coughing, wheezing and difficulty breathing.

Although bleach is the most common disinfectant in the world, there are still widespread misconceptions about the chemistry and risks associated with using it both at home and for professional cleaning purposes. One of the most common myths is that bleach causes asthma. The purpose of this bulletin is two-fold: 1) to provide education about what asthma is and the role that allergens and respiratory irritants play and 2) to present data that demonstrates how bleach can improve the lives of asthmatics and other individuals who suffer from respiratory hypersensitivity.



## Bleach in literature and the link to respiratory symptoms

There are several studies in literature that suggest a link between regular use of bleach and asthma and/or asthma-type symptoms. For example, Medina-Ramon et al. concluded that “cleaners who used bleach almost daily had a significant increase in risk of developing asthma.” However, if the methodology is closely examined, it’s clear that the respiratory symptoms were a result of misuse in the majority of cases, as referenced by both reports of using bleach “undiluted” and/or mixing bleach with other cleaners resulting in accidental inhalation of vapours.<sup>2</sup>

In 2010, a peer-reviewed report from the Toxicology Excellence for Risk Assessment (TERA) provided a summary evaluation of the existing literature on the role of cleaning products and the incidence of asthma and asthma-like symptoms. The report concluded that after a weight of evidence review, “exposure misclassification” had a greater influence on the various study results given that none of the papers measured actual environmental exposure levels during use.<sup>3</sup> The report goes on to say that “product misuse (e.g., mixing bleach with acids) was reported during cleaning (Medina-Ramon et al. 2005; Zock et al. 2001) and may play a large role in the onset of respiratory disease including asthma, as is evidenced by multiple case reports/series (Deschamps et al. 1994; Gorguner et al. 2004; Guthua et al. 2001; Mapp et al. 2000).”<sup>3</sup>



# Addressing Concerns About Bleach

## What is an irritant?

Sensory irritants are chemicals that evoke a stinging or burning sensation in the nose and throat. All chemicals or odours can be irritants if they are present in high enough concentrations. If an irritant is strong enough, it can trigger an asthmatic response in individuals who do have asthma – or it can trigger symptoms that mimic asthma. These irritants differ from allergens in that they do not generate an immune response, but instead, they stimulate a normal neurophysiological response. In individuals who already have existing respiratory conditions, an irritant may easily cause symptoms in already inflamed airways. Individuals with inflamed or ticklish airways may have a condition known as hyper responsive airways.

## Is bleach an irritant?

When bleach is used as directed, the chlorine species emitted are lower than the levels that cause respiratory irritation and below the EPA's occupation-exposure limits for chlorine.<sup>4</sup>

Some chemicals, however, can induce respiratory irritation without the immediate sensory experience.<sup>5</sup>

At elevated concentrations, some chemicals can produce respiratory-tract irritation, which can result in asthma-like symptoms. In the case of exposure to concentrated bleach and/or product misuse (such as bleach mixed with acids), exposure can result in asthma-like symptoms.

## Does bleach cause asthma?

Many people believe that bleach causes asthma. It doesn't. In fact, there are many published scientific studies that demonstrate how the use of sodium hypochlorite can reduce the antigens that trigger asthmatic symptoms.<sup>6,7</sup>

Zock et. al demonstrated that sensitization to cat allergens is reduced in adults if bleach is used at least once per week (specifics on how bleach was used were not provided). The authors also found that bleach, if used four to seven times per week, can also reduce sensitization to dust mites.<sup>8</sup>

There is also a wealth of Clorox® internal data that demonstrates the efficacy of bleach vs. various allergens. For example, the table below demonstrates the efficacy of Clorox® Clean-Up® Cleaner with Bleach spray, a bleach-based disinfectant, in the inactivation of various allergens vs. the non-bleach-based competitive set:

	Der p1 Dust Mite	Der p2 Dust Mite	Fel d1 Cat Dander	Fel d1 Dog Dander
<b>Products</b>	<b>Reduction</b>			
<b>Bleach-Based Disinfecting Sprays (3 minutes)</b>				
Clorox® Clean-Up® Spray	99%	96%	>99%	>99%
<b>Other Non-Bleach Spray Cleaners (10 minutes)</b>				
Lysol® Antibacterial Kitchen Cleaner	28%	20%	2%	1%
Lysol® Lemon All-Purpose Cleaner	31%	5%	0	2%
Lysol® Basin, Tub & Tile Cleaner	97%	0	0	0
<b>Other Non-Bleach Disinfecting Sprays (10 minutes)</b>				
Lysol® Disinfecting Spray	99%	64%	11%	22%

## Conclusion

Although there is a great deal of “chatter” about the use of bleach and the risk of asthma, the data points to a very different conclusion. Sodium hypochlorite is very effective at inactivating the proteins in allergens that cause respiratory symptoms and therefore, when used as directed, can eliminate antigens that cause asthmatic symptoms. The literature also highlights that the use of concentrated cleaning chemicals increases the incidence of adverse effects on respiratory health due to improper use — supporting the notion that ready-to-use products ensure both efficacy and end-user health and safety.

1. Stats Canada. <http://www.statcan.gc.ca/tables-tableaux/sum-som/101/cst01/health50a-eng.htm>.
2. Medina-Ramon, M., Zock, J. P., Kogevinas, M., Sunyer, J., Torralba, Y., Borrell, A., Burgos, F., Anto, J. M., 2005. Asthma, chronic bronchitis, and exposure to irritant agents in occupational domestic cleaning: a nested case-control study. *Occup Environ Med.* 62, 598-606.
3. Toxicology Excellence for Risk Assessment (TERA) 2010. Critical Evaluation of Potential Contribution of Cleaning Products and their Ingredients on Asthma-Like Symptoms and the Incidence of Asthma.
4. Agency for Toxic Substance and Disease Registry – Toxicology Profile for Chlorine, <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=1079&tid=36>.
5. Doty, R. L., Commetto-Muniz, J. E., Jalowayski, A. A., Dalton, P., Kendal-Reed, M., Hodgson, M., 2004. Assessment of Upper Respiratory Tract and Ocular Irritative Effects of Volatile Chemicals in Humans. *Crit. Rev. Toxicology.* 32, 85-142.
6. Chen, P., Eggleston, P.A. 2001. Allergenic proteins are fragmented in low concentrations of sodium hypochlorite. *Clin Exp Allergy* 31:1086-1093.
7. Matsui, E., Kagey-Sobotka, A., Chichester, K., Eggleston, P.A. 2003. Allergic potency of recombinant Fel d 1 is reduced by low concentrations of chlorine bleach. *Journal of Allergy Clinical Immunology.* 111:396-401.
8. Zock, J. P., Plana, E., Anto, J., Benke, G., Blanc, P., Carosso, A., Dahlman-Hoglund, A., Heinrich, J., Jarvis, D., Kromhout, H., 2009. Domestic use of hypochlorite bleach, atopic sensitization, and respiratory symptoms in adults. *J Allergy Clinical Immunology.* 124: 731-738.



# Use These Clorox Healthcare® Bleach-Based Products to Kill the Toughest Pathogens in Your Facility

Clorox Healthcare® products are suitable for use on a variety of hard, nonporous surfaces, including stainless steel, plastic and other synthetic materials, when used as directed. Use these products to disinfect frequently touched surfaces such as countertops, light switches and bedrails.

## Bleach-Based



**Clorox Healthcare®  
Professional Disinfecting Bleach Wipes**  
Health Canada DIN 02401983

**PRODUCT INFORMATION**  
**6.75" x 9" wipe size**  
Case UPC 100 55500 01308 8 6/70 ct.

**Effective against 46 microorganisms in 1 minute & *C. diff* spores in 3 minutes**



**Clorox Healthcare®  
Professional Disinfecting Bleach Wipes**  
Health Canada DIN 02401983

**PRODUCT INFORMATION**  
**12" x 12" wipe for Terminal Cleaning**  
Case UPC 100 55500 01309 5 2/110 ct.

**Effective against 46 microorganisms in 1 minute & *C. diff* spores in 3 minutes**



**Clorox Healthcare®  
Professional Disinfecting Bleach Wipes**  
Health Canada DIN 02401983

**PRODUCT INFORMATION**  
**12" x 12" wipe size - Refill**  
Case UPC 100 55500 01310 1 2/110 ct. Refill

**Effective against 46 microorganisms in 1 minute & *C. diff* spores in 3 minutes**



**Clorox Healthcare®  
Professional Disinfecting Bleach Cleaner**  
Health Canada DIN 02399156

**PRODUCT INFORMATION**  
**946 mL Bottle**  
Case UPC 100 55500 01416 0 6/946 mL

**Effective against 36 microorganisms in 1 minute & *C. diff* spores in 5 minutes**

Use as directed on hard, nonporous surfaces.

For more information, contact your Clorox sales representative or call **1.866.789.4973**.  
**email: [healthcare@clorox.com](mailto:healthcare@clorox.com)**  
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