

Asthma: The Basics

Asthma is a chronic inflammatory disorder of the airways. Chronically inflamed airways are hyper-responsive; they become obstructed and airflow is limited (by bronchoconstriction, mucus plugs, and increased inflammation) when airways are exposed to various risk factors. Symptoms include chest tightness, coughing, shortness of breath and wheezing. Asthma can be triggered by a variety of exposures such as dust mites, mildew mould, pets, rodents, tobacco smoke, dampness, chemical exposure and strong odors. Uncontrolled asthma can result in hospitalisation and potentially death.¹

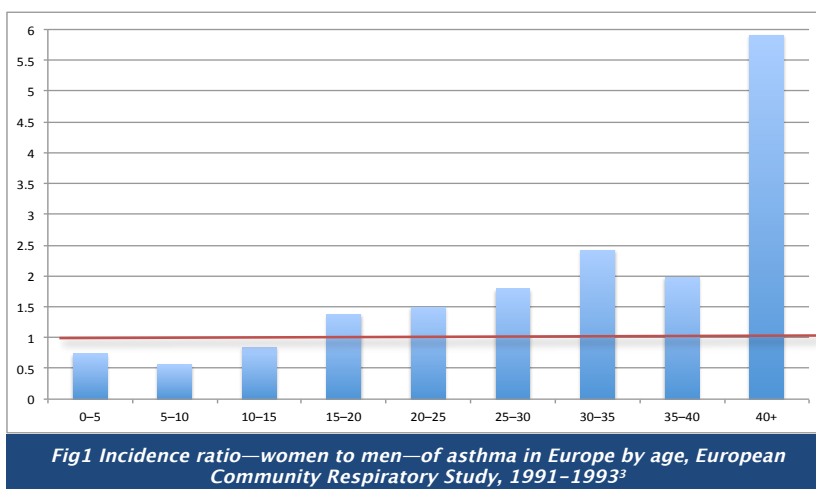


Fig1 Incidence ratio—women to men—of asthma in Europe by age, European Community Respiratory Study, 1991–1993³

In Europe, rates of asthma have doubled in the last ten years. About thirty million people have asthma, about six million of whom have severe symptoms. Annually, asthma costs Europe €17.7 billion, including an estimated €9.8 billion annual loss in productivity from poorly controlled asthma.²

Asthma, Gender and Age

According to the OECD, in Europe, asthma is more common in females (4.3%) than in males (3.3%) ages fifteen and older with the exception of Slovenia.⁴ In childhood, boys have twice the rate of asthma as girls. However, the rates reverse once girls reach puberty.⁵

The chart of incidence ratios from the European Community Respiratory Study illustrates these gender and age trends in new rates of asthma. Under the age of 15, males have higher rates of asthma. However, with age, new cases of asthma are much higher in women than in men. The orange line of Fig 1 above indicates when the rate of new cases in women outpaces that of men. This rate peaks in the over 40 age group, with nearly six new cases of asthma in women for every one case of new asthma in men.

In adulthood, more women suffer from asthma than men. Women in the age group twenty to fifty are especially affected. Severe complications from asthma are more common in women than in men, leading to more frequent or longer hospitalisation and higher rates of death.^{6,7,8} Women have a higher rate of nonallergic asthma, occurring in 65% of new-onset cases in women compared to 37% of new-onset cases in men.⁹ The reasons for these gender differences are not entirely understood, though researchers believe that the answer is strongly connected to hormones.^{10,11}

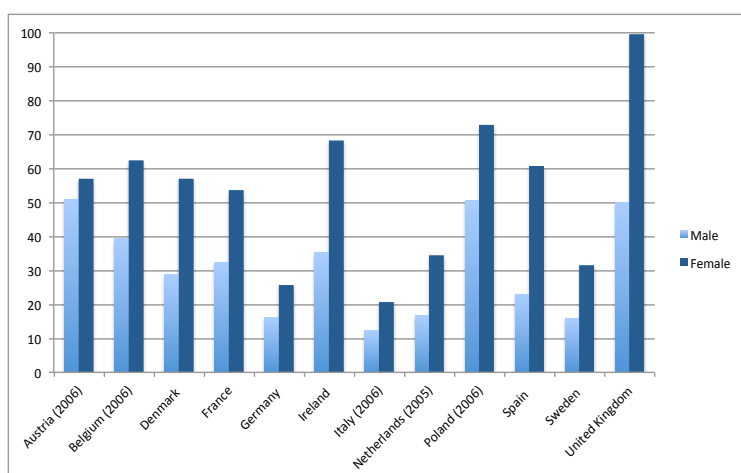


Fig 2 Avoidable hospitalisations from asthma by gender, age 15 and over, 2009 or more recent year, selected EU countries²¹

In 2009, asthma accounted for 53 of 100,000 hospital admissions in the EU. Hospitalisation from asthma was twice the EU average in Slovakia and Latvia. In adult populations, women had higher hospitalisation rates than men from asthma. On average in the EU, female hospitalisation rate was 70% higher in women than men.¹² Among children, asthma prevalence and hospital admissions are higher in boys than in girls.¹³ The reasons for gender differences in asthma related hospital admissions are not well understood.¹⁴ Rates of asthma in women have increased in Europe. Thus, compared to men, women have poorer quality of life and increased hospitalisation despite having comparable baseline pulmonary function and medical treatment.¹⁵

Sex-specific Differences in Asthma – the Influence of Hormones

Female hormones have a large impact on asthma, affecting 40% of women with asthma, and can have almost as much of an impact as triggers such as allergens. Fluctuation in levels of estrogen can lead to airway inflammation. Thus women with asthma should monitor their menstrual cycles and avoid exposure to allergens during this time, as asthma attacks are more likely to occur right before a women's menstrual cycle when her estrogen is low. Most female hospitalisations from asthma occur at the peri-menstrual state. In particular, girls during puberty can find that their asthma worsens before their cycle, though the frequency and severity may decrease with age.^{16,17,18}

Scientists believe that genetic differences may impact the gender differences in asthma rates and severity. Certain specific genes are correlated with asthma in women but not in men. Researchers also speculate that there may be sex-specific differences in the regulation and expression of genes which impact on female prevalence and severity as regards asthma.¹⁹ In addition, women of the same age and height as men have smaller lungs and narrower bronchial tubes than men.²⁰

Social Factors, Gender and Asthma

Environmental exposures vary much between gender as women typically spend more time at home than men, which exposes them more to asthma triggers than men.²² Certain occupations in which the majority of workers are women, such as domestic cleaning, have elevated rates of asthma.²³

Women generally have a disproportionate greater share of caring and household responsibilities than men. As a result, they tend to be more exposed to asthma triggers like allergens (dust, fungus, mould, and yeasts) and sensitising agents (cleaning materials and household sprays). Also, perfumes, scented personal care products, cosmetics, and other products can trigger asthma.²⁴ With regard to healthcare, women may be more likely than men to identify their asthma symptoms, report them to a doctor and seek medical care during an asthmatic episode.²⁵

Asthma and Osteoporosis

People with asthma can suffer from higher rates of osteoporosis than those without asthma, particularly in the spine.^{26,27} Generally, women are more susceptible to osteoporosis, so women with asthma should be careful. Research indicates that over time, the continual use of steroid tablets or high doses of inhaled steroids may increase the risk of osteoporosis.²⁸ Medication that many asthma patients take, can reduce the amount of calcium available to be absorbed in food. In addition, many patients with asthma avoid dairy products due to concerns that they may be allergic, and it will trigger an asthma attack, further increasing the risk of osteoporosis. Furthermore, some individuals with asthma avoid weight-bearing exercise, which has been shown to increase bone strength.²⁹

Asthma, Pregnancy and Menopause

Pregnancy has varied effects on women with asthma. For 1/3 of women, their asthma gets worse during pregnancy, another 1/3 have improvements and for another 1/3, pregnancy makes no difference. Controlled asthma does not impact complication rates in pregnancy, although uncontrolled asthma can be dangerous to the woman and her fetus. In pregnant women, uncontrolled asthma can result in high blood pressure and preeclampsia (high blood pressure and protein in urine that can harm the woman and her fetus). Most asthma medications are safe during pregnancy and the risks of uncontrolled asthma are far greater than the risks to mother or fetus from the medications used to control asthma.³⁰

Studies have found that smoking during pregnancy increases the risk of asthma in children even when children were not exposed to second-hand smoke after birth. Children exposed to smoking in the womb were two-thirds more likely to have asthma by age six, compared to children whose mothers did not smoke during pregnancy. Smoking only during the first trimester—in cases where women quit smoking for the second and third trimester—was linked to higher asthma risk in children as well.³¹

Some women develop asthma for the first time in their lives during menopause. A recent literature review and meta-analysis found no significant association of menopause with asthma prevalence or incidence, except for women reporting use of Hormone Replacement Therapy (HRT—female hormones medication treatment for women after menopause). However, these findings resulted from a small number of studies, including only one large cohort with incidence rates for pre- as well as post-menopause. Further studies are needed to allow robust analyses of the association of HRT and asthma.³²



References

1. GINA. Global Initiative for Asthma <http://www.ginasthma.org/guidelines-pocket-guide-for-asthma-management.html>.
2. European Federation of Allergy and Airway Disease Patients Association (EFA). 2012. *Asthma*. <http://www.efanet.org/asthma/index.html>
3. De Marco, R., F. Locatelli, J. Suney, P. Burney & European Community Respiratory Health Survey Study Group. 2000. "Difference in Incidence of Reported Asthma Related to Age in Men and Women. *American Journal of Respiratory and Critical Care Medicine* 162(1): 68-74.
4. OECD (2012). *Health at a Glance*. http://ec.europa.eu/health/reports/docs/health_glance_2012_en.pdf.
5. National Jewish Health. 2009. *National Jewish Health Pulmologist Outlines Unique Features of Asthma in Women*. <http://www.nationaljewish.org/about/mediacenter/pressreleases/2009/unique-features-of-asthma-in-women/>
6. Hatfield, H. 2012. "Asthma in Women." *WebMD*. <http://www.webmd.com/asthma/features/asthma-women?page=3>
7. Office on Women's Health. 2006. *Health Fact Sheet: Asthma and Women*. http://www.nj.gov/health/fhs/asthma/documents/women_and_asthma.pdf.
8. Asthma Free Life. 2012. *Asthma Deaths: A look at the statistics*. <http://www.asthmafreelife.com/asthma-deaths.html>.
9. Cowen, L. 2012. "Women have increased risk for nonallergic asthma." *Thorax*. http://www.medwire-news.md/48/97676/Respiratory/Women_have_increased_risk_for_nonallergic_asthma.html
10. Hatfield, H. 2012.
11. NJH. 2009.
12. OECD (2012). *Health at a Glance*.
13. Lin, R. Y., & Lee, G. B. (2008). The gender disparity in adult asthma hospitalizations dynamically relates to age. *J Asthma*, 10, 931-935.
14. Melero-Moreno, C. et al. (2012), "Factors Related with the Higher Percentage of Hospitalisations Due to Asthma Amongst Women: The FRIAM Study", *Archivos de Bronconeumologia*, forthcoming.
15. Kynnyk, J.A. et al. (2011), "Asthma, the Sex Difference", *Current Opinion in Pulmonary Medicine*, Vol. 17, No. 1, pp. 6-11.
16. Asthma UK. 2012. *Women and Asthma*. http://www.asthma.org.uk/all_about_asthma/asthma_adults/asthma_women.html
17. Hatfield, H. 2012.
- 18, 14. NJH. 2009.
19. Partners Asthma Center. 2010. *Asthma in Women*. <http://www.asthma.partners.org/newfiles/BoFACChapter18.html>
20. OECD. 2010. *Health at a Glance: Europe 2010*. http://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-europe-2010_health_glance-2010-en
21. Lung & Asthma Information Agency. 2005. *Severe asthma across Europe: a review of available data*. <http://www.laia.ac.uk/pubs/sevasth.pdf>
22. Partners Asthma Center. 2010.
23. Medina-Ramon, M., J.P. Zock, M. Kogevina, J. Sunyer & J.M Anto. 2003. Asthma symptoms in women employed in domestic cleaning: a community based study. *Thorax*(58).
24. The Center for Management of Chronic Diseases. 2007. *Effect of Self-Regulatory Education on Women with Asthma*. <http://cmcd.sph.umich.edu/women-with-asthma.html>
25. Partners Asthma Center. 2010.
26. Asthma UK. 2012. *Women and Asthma*. http://www.asthma.org.uk/all_about_asthma/asthma_adults/asthma_women.html
27. NIH Osteoporosis and Related Bone Diseases National Resource Center. 2011. *What People with Asthma Need to Know About Osteoporosis*. http://www.niams.nih.gov/Health_Info/Bone/Osteoporosis/Conditions_Behaviors/asthma.asp#b
28. Hatfield, H. 2012.
29. Office on Women's Health. 2006.
30. Hatfield, H. 2012.
31. Asthma UK. 2012. *Pregnancy*. <http://www.asthma.org.uk/about-asthma/living-with-asthma/asthma-and-women/pregnancy>.
32. Norton, A. 2012. *Smoking during pregnancy tied to kids' asthma*. <http://www.reuters.com/article/2pa012/08/21/us-smoking-pregnancy-asthma-idUSBRE87K0ZF20120821>
33. Zemp E, Schikowski T, Dratva J, Schindler C, Probst-Hensch N. 2012. "Asthma and the menopause: A systematic review and meta-analysis." *Maturitas*.

STEPS FOR POLICY ACTION

- 1) **Improve existing EU data collection on asthma.**
Currently, little data collection occurs at EU level examining asthma prevalence, incidence, morbidity and mortality across the 28 Member States in comparison to other chronic diseases in Europe and in comparison to other developed countries in the world. Data should be collected annually at the national and EU levels on the various indicators of asthma, disaggregated by gender, age and other important factors. Regular and extensive data collection will inform government officials, policymakers, health officials and patient organisations in order to combat the rising asthma burden across the EU.
- 2) **Examine the effect of social determinants of asthma development and progression.**
Asthma disproportionately affects adult women. Women who share an unequal burden of household work in comparison to men, especially professional household cleaners, are at heightened risk. In order to tackle health inequalities, policymakers and healthcare professionals must understand the effect of social determinants on asthma and support health literacy programmes, tailored specifically at women.
- 3) **Explore the impact of other risk factors and triggers on asthma development and severity.**
Various other risk factors, some preventable, others not, increase women's susceptibility to asthma. Efforts should be made to better understand factors, such as smoking, age and hormones.
- 4) **Examine the impact of asthma treatment on women's health.**
Studies have demonstrated that asthma and asthma treatment impact an individual's risk of osteoporosis. Older women are thus particularly at risk. Efforts should be made to raise awareness in women and healthcare professionals of this interconnection to encourage early prevention of osteoporosis.
- 5) **Increase accessible health information on asthma prevention and treatment.**
Ensure that high-quality, accessible and accurate information is available to EU citizens to educate them about risks, prevention and treatment.
- 6) **Encourage more research to improve our knowledge of the complexity of asthma.**
Examine how environmental and genetic risk factors interact with each other and the immune system in order to improve asthma prevention, diagnosis and treatment. Study the influence of female hormones and HRT in asthma in women.

A special thank you to expert-reviewers:

Sandra Kuiper, PhD

Faculty of Health Medicine and Life Sciences, Maastricht University

Lina Buzermaniene and Roberta Savli

European Federation of Allergy and Airways Diseases Patients' Associations



European Institute of Women's Health
<http://www.eurohealth.ie>

Updated October 2014