



## Smoking and children health- A Review

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### ABSTRACT

Tobacco use by children and adolescents is a major health threat. A number of careinogens and other harmful compounds have been identified in tobacco smoke. The major component, nicotine, is highly addictive. In India, approximately 5500 children and adolescents start using tobacco products daily, some as young as 10 years old. The majority of users have first tried tobacco prior to age 18. Children and adolescents are exposed to the harmful effects of nicotine from smoking or second hand smoke from others; and from use of smokeless tobacco. There is increased prevalence of respiratory disease, ear and sinus infections, asthma, oral disease, and many longterm complications such as cardiovascular disease and cancers due to tobacco use. Prevention and treatment strategies include behavioural approaches and pharmacotherapy.

### INTRODUCTION

Tobacco has been used in various forms by man for more than a century all over the world. The tobacco plant *Nicotiana tabacum* is grown in many parts of the world for commercial purposes. It is named after Jean Nicot, who first proposed its medicinal use. L Approximately 4000 different compounds have been identified in tobacco of which about 60 compounds are carcinogens, tumor initiators, and tumor promoters. These include tar, carbon monoxide, hydrogen cyanide, phenols, ammonia, formaldehyde, benzene, nitrosamine, and nicotine. Carbon monoxide is known to interfere with the transport and utilization of oxygen.<sup>1</sup> Cigarette smoke contains 2-6% CO, and it increases the carboxyhemoglobin (COHb) levels of blood, up to 2-15% in smokers, in contrast with the 1% in nonsmokers. Ciliotoxins and other irritants present in the smoke increase the bronchial mucus secretions, impair mucociliary clearance, and contribute to decreased pulmonary function. The major component of tobacco with wide ranging adverse health consequences is nicotine. On an average the nicotine content for smoking tobacco is between 1 to 2%. Nicotine is a strong base, and works both as a central nervous system stimulant as well as a depressant. It also has direct and indirect effects on neuroendocrine systems. It is readily absorbed from lungs, mucus membranes, and skin. Following inhalation of the smoke, nicotine is absorbed into the circulation, and reaches brain and other organs within 10-19 seconds. Structurally, nicotine

resembles the neurotransmitter acetylcholine. Nicotine acts on stereospecific cholinergic receptors in the brain and other organs.<sup>2</sup>

Passive smoking, also known as secondhand smoke or environmental tobacco smoke, refers to the inhalation of tobacco smoke by non-smokers who are in the vicinity of smokers. It occurs when smokers exhale smoke directly into the air, and this smoke is then inhaled by others nearby.<sup>2</sup> Passive smoking can have detrimental effects on the health of non-smokers, as they are exposed to many of the same harmful chemicals and toxins present in mainstream smoke. The smoke emitted by cigarettes contains over 7,000 chemicals, including at least 70 known to cause cancer.

**Health Effects:** Non-smokers exposed to passive smoking are at an increased risk of developing various health problems, including respiratory infections, asthma, bronchitis, pneumonia, and lung cancer. It can also worsen existing conditions, such as asthma or allergies. In children, passive smoking is particularly harmful and can lead to more frequent and severe respiratory illnesses, sudden infant death syndrome (SIDS), and impaired lung function.

**Sources of Exposure:** Passive smoking can occur in various settings, such as homes, workplaces, cars, restaurants, bars, and public spaces. It occurs when non-smokers breathe in the smoke from burning cigarettes, cigars, or pipes. It is important to note that even smokeless tobacco products (like chewing tobacco) can produce secondhand smoke and pose risks to those nearby.

**Dangers of Second hand Smoke:** Second hand smoke is a mixture of mainstream smoke (exhaled by the smoker) and side stream smoke (emitted directly from the burning tobacco product). Side stream smoke contains higher concentrations of toxins and is more harmful than mainstream smoke. It has smaller particles that can penetrate deeper into the lungs and linger in the air longer.<sup>3</sup>

**Protection and Prevention:** The most effective way to protect oneself and others from passive smoking is to create smoke-free environments. Smoke-free policies in public places, homes, and vehicles can significantly reduce exposure to secondhand smoke. It is also crucial for smokers to refrain from smoking around non-smokers, especially in enclosed spaces. Opening windows or using ventilation systems is insufficient to eliminate the risks associated with second hand smoke.

**Legal and Social Measures:** Many countries have implemented laws and regulations to protect people from the dangers of second hand smoke. These laws include restrictions on smoking in public areas, workplaces, and certain outdoor spaces. In addition to legal measures, raising awareness about the health risks of passive smoking can help promote smoke-free environments and encourage smokers to quit.<sup>4</sup>

Passive smoking poses significant health risks to children. Children are particularly vulnerable to the effects of second hand smoke due to their smaller lungs, faster breathing rates, and developing immune systems. Here are some important points about passive smoking and children's health:

**Respiratory Issues:** Children exposed to second hand smoke are more prone to respiratory problems such as frequent coughing, wheezing, bronchitis, pneumonia, and asthma. Passive smoking can trigger asthma attacks, make symptoms worse, and increase the risk of developing asthma in children who are genetically predisposed to the condition.<sup>5</sup>

**Ear Infections:** Children exposed to second hand smoke are at a higher risk of developing ear infections (otitis media). The smoke can irritate and inflame the Eustachian tubes, leading to fluid buildup and infection in the middle ear.

**Sudden Infant Death Syndrome (SIDS):** Passive smoking is strongly linked to an increased risk of Sudden Infant Death Syndrome, also known as SIDS or crib death. Babies exposed to second hand smoke have a higher likelihood of experiencing SIDS, which is the sudden, unexplained death of an otherwise healthy infant under one year of age.

**Impaired Lung Function:** Second hand smoke can hinder the development of children's lungs, leading to reduced lung function and compromised respiratory health later in life. It can cause long-term damage, increasing the risk of chronic respiratory conditions like chronic obstructive pulmonary disease (COPD) and lung cancer in adulthood.<sup>6</sup>

**Behavioral and Cognitive Effects:** Some studies suggest that passive smoking may have negative impacts on children's behavior and cognitive development. It has been associated with increased risk of behavioral problems, decreased cognitive performance, and even lower IQ scores.

**Protection and Prevention:** To protect children from the dangers of passive smoking, it is crucial to create smoke-free environments, especially in homes and cars. Establishing and maintaining a smoke-free home is essential to minimize exposure. Encouraging smokers to quit or smoke outside the vicinity of children is also beneficial. Additionally, implementing smoke-free policies in public spaces, schools, and childcare facilities helps reduce children's exposure to second hand smoke.<sup>7</sup>

**Long-Term Health Risks:** Children exposed to passive smoking have an elevated risk of developing chronic diseases later in life, including respiratory disorders (such as asthma and chronic obstructive pulmonary disease) and cardiovascular diseases.

The 1992 RCP report *Smoking and the young* summarised the impacts of smoking on children at a time when much of the evidence of harm was still only just beginning to emerge. A new report from the RCP, *Passive smoking and children*, has therefore been produced to review this evidence again, and to quantify the effect of second-hand smoke on children's health.<sup>8</sup> There were two main drivers in producing the report – firstly, the need to update the epidemiological estimates of harm to children from passive smoking, including relative risks, hospital admissions and general practice (GP) attendances and, secondly, to identify policy areas to reduce exposure in the future. The new report presents systematic reviews and meta-analyses of the major health effects of passive smoking in children, and estimates that exposure causes about 20,000 cases of lower respiratory tract infections, 120,000 cases of middle ear disease, at least 22,000 cases of wheeze and asthma, 200 cases of bacterial meningitis and 40 sudden infant deaths in UK children each year. This burden of disease results in over 300,000 UK GP consultations, around 9,500 admissions to hospital each year, and a significant cost to the NHS – an estimated £9.7 million to primary care, £13.6 million on hospital admissions and £4 million on asthma drugs. It also estimates that around 23,000 children become regular smokers by the age of 15 as a result of exposure to smoking by their parents.<sup>9</sup>

Reducing smoking prevalence requires sustained increases in the real price of tobacco, further reduction in smuggling and illicit trade, sustained investment in mass media campaigns targeting parents and younger adults in general, more effective health warnings,

prohibition of point of sale display, mandatory generic standardised packaging, provision of tailored cessation services, and a range of other policies. Smoke-free homes can be promoted through mass media campaigns, behavioural interventions, and possibly by substituting cigarettes with medicinal nicotine. However, perhaps most importantly, it is necessary to reduce still further the exposure of children to smoking behaviour as well as to tobacco smoke. This will require a radical rethink on where it is reasonable and acceptable for adults to smoke. It will also require further legislative measures to prevent exposure that does still occur outside the home, for example in private vehicles.<sup>10</sup>

Children have a right to grow up in a safe environment, and parents and governments have a moral duty to provide one. Passive smoking, and smoking behaviour, is a major hazard to children's health. Although relatively neglected in the debate on smoking to date, it is time to prioritise the health and rights of children to grow up in a smokeless environment free from exposure from adult smoking role models. Attitudes to smoking in the UK have undergone a major shift in recent years, but there is still a long way to go. It is time for a new approach to safeguarding children from the hazards of tobacco smoke and tobacco smoking. Our children's health depends on it.

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