



HONG KONG COUNCIL ON SMOKING & HEALTH



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# **THE PREVENTION OF PASSIVE SMOKING IN HONG KONG**

## **An urgent public health priority**

**A briefing paper presented to the  
LegCo Environmental Affairs Panel**

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## Executive Summary

- Tobacco smoke in the form of Environmental Tobacco Smoke (ETS) is an extremely poisonous mixture of chemical compounds.
- The evidence of serious harm to children from passive smoking is universally acknowledged. In response to the *Declaration on Children's Environmental Health*, adopted by the Environment Leaders of the G8 countries in May 1997, the WHO convened an International consultation on Environmental Tobacco Smoke and Child Health in Geneva Jan 1999. It concluded that the evidence of harm to children is consistent and robust and that this involuntary and harmful exposure can also be seen as a human rights violation.
- In Hong Kong about half of the children are of exposed to ETS in their home and this is strongly associated with increased risks of hospitalization for chest infection and with chronic respiratory symptoms such as cough, phlegm and wheeze, increased doctor consultations and medical care expenses to families.
- The exposure of workers and other adults to passive smoking in Hong Kong shows a consistently high prevalence in multiple independent surveys. Exposure to ETS in these groups is associated with increased risks of respiratory symptoms, use of medicines, doctor consultations and sickness absence from work. The evidence points to a high cost to the community associated with passive smoking.
- Passive smoking causes lung cancer and ischaemic heart disease in non-smokers as shown by multiple studies by different investigators in different populations and countries.
- The health of all workers including those in catering establishments must be protected as a matter of urgency. Overseas studies clearly show immediate benefits to catering workers following smoking bans in their workplace.
- The Council on Smoking and Health regularly receives many complaints about involuntary exposure to ETS in restaurants, shopping malls, and transportation. Surveys of public opinion indicate a high level of demand for non-smoking facilities in the catering and hospitality industry. The indications are that restaurant business would benefit from clean air ordinance which include smoking bans.
- In the United States total bans on smoking in restaurants and bars have not been associated with a drop in business as indicated by taxable earnings. The dire warnings from the tobacco industry of damage to restaurant businesses have been thoroughly investigated and shown to be wrong.
- Hong Kong needs a much improved strategic plan to prevent passive smoking in
  - the home
  - the workplace
  - transportation
  - public places including restaurants, bars and other catering facilities

- The approach must be multisectoral, including health, labour, environment and disciplined services.

We must move quickly to enforce existing legislation effectively and also to develop in turn

- Effective guidelines
  - Codes of Practice
  - New Legislation
- It is clear that the scientific evidence indicates that the health of many both children and adults is impaired by passive smoking in Hong Kong.
  - It follows that here is an ethical imperative for effective public health action.

## Synopsis

*Priorities in public health and Healthy Living in Hong Kong  
Environmental Tobacco Smoke (ETS) (Second hand tobacco smoke)*

*Health risks of passive smoking  
in children  
in adults*

*Evidence from Hong Kong on damage to health from passive smoking  
Increased health care utilization and costs*

*Problems of enforcement in Hong Kong*

*The way forward: health promotion, codes of practice and legislation*

## **Is passive smoking an issue for “Healthy Living” in Hong Kong?**

The Hong Kong Government, through the Chief Secretary’s establishment of the *Healthy Living* campaign, and the setting up of the Environmental Health and Food Bureau, recognizes the need to strengthen environmental health promotion and protection in the HKSAR.

There has been considerable justified concern about increasing levels of ambient air pollutants in Hong Kong. Attention is now turning to indoor air quality (IAQ) and the purpose of this paper is to emphasise that tobacco smoke is the most serious and prevalent pollutant affecting IAQ and that the short term adverse health effects, for those who are exposed, are even greater than that resulting from outdoor pollution.

Tobacco related health problems are the biggest single preventable causes of avoidable illness and premature death in Hong Kong. The biggest demands on health care services in Hong Kong arise from acute respiratory health problems in the primary medical sector and several chronic and malignant diseases in the specialist medical sector. Many of these are caused or aggravated by tobacco. Diseases and illness episodes caused by tobacco place a huge burden on Hong Kong health services at all levels and also increase out of pocket expenses for individuals and families. That is why any new initiatives to tackle problems of indoor air quality in Hong Kong must begin with effective measures to prevent passive smoking.

### **What is Environmental Tobacco Smoke (ETS)?**

A cigarette generates two types of emission when it is smoked called mainstream and sidestream smoke.

**Mainstream smoke** is the smoke exhaled by the smoker; this smoke has passed through the cigarette filter (if one is used) and the smokers’ lungs.

**Sidestream smoke** is emitted from burning tobacco, at the tip of the cigarette, between puffs.

ETS comprises more than 4000 compounds of which over 50 are known cancer causing agents. Other constituents include toxic gases and oxidants which may damage tissues and impair human reproductive or developmental processes and normal body functions.

In the US Environmental Protection Agency (EPA) report (1992), 17 cancer causing compounds were described as occurring at higher levels in sidestream smoke than in mainstream smoke.

Indoor air levels of fine particulates (respirable particulates or RSP) vary with the amount of tobacco smoked in the indoor area. With the usual levels of ETS in smoky atmospheres, particulates can rise to 500  $\mu\text{g}/\text{m}^3$ . The US EPA annual standard for inhalable particles is 50  $\mu\text{g}/\text{m}^3$ .

Up to 80% of the public have nicotine metabolites in their circulation indicating that most people are being exposed to some level of the toxic components of ETS.

### **What are the findings from global research about the harm of passive smoking?**

The tobacco industry maintains that “The degree to which ETS exposure represents a health hazard remains a point of contention”. On the other hand the world’s scientific literature clearly shows that among truly independent medical and public health scientists there is a consensus that passive smoking is a serious health hazard with no safe level of exposure.

#### **Odour and irritation**

***Irritation:*** Exposure to passive smoking leads to many symptomatic complaints such as irritation of the eyes, nose and throat. It is clearly a potent irritant for many people in either leisure or work settings and a widespread but preventable cause of discomfort and stress.

***Odour:*** The strong odour of cigarette smoke and the tissue irritation is attributed to several chemicals in the smoke including pyridine (odour), organic acids (acetic, propionic) aldehydes (formaldehyde, acrolein), nicotine, ammonia, toluene, sulphur dioxide and nitrogen oxides plus other compounds.

***Mucous membranes:*** Several studies have demonstrated that ETS stimulates the nerves which supply the mucous membranes in the nose, mouth and eyes. In addition to the symptoms experienced there is evidence that ETS causes a marked reaction in these sensitive body tissues, such as nasal congestion, running nose, sneezing and post-nasal drip, and disruption of the normal eye lubrication by tears.

*The importance of the symptoms of irritation is that they indicate that exposure to the toxic compounds in tobacco smoke is taking place.*

#### **Effects of ETS on pregnant mothers and children**

Children are very sensitive to air pollutants of all kinds and many studies show that they are seriously injured by exposure to passive smoking, for example if they live in a smoking home. Children experience chronic respiratory symptoms, middle ear disease, pneumonia and other acute chest problems requiring admission to hospital. Passive smoking in infants shows a strong causal link with the Sudden Infant Death

Syndrome (SIDS). SIDS is defined as the sudden death of an infant aged 1 month to 1 year, which is unexpected and remains unexplained by a definitive medical diagnosis after a thorough investigation.

***Pregnancy and the growth of the foetus:*** More than 25 studies have examined the relationship between ETS exposure in pregnancy, foetal growth and birth weight. Twenty four of these found a trend towards lower birth weight babies. If the overall effect is to push the birth weight distribution downwards then babies who are already vulnerable may be at even higher risk. Low birth weight is associated with infant deaths in the perinatal period and with failure to thrive in the first year of life.

***Chronic respiratory symptoms in children:*** A great many studies have linked long term home exposures with recurrent symptoms of cough, phlegm and wheeze. The youngest children are particularly sensitive. Reported increased risks range from 20% up to over 300%, between different countries and depending on the amount of exposure.

***Respiratory infections in children:*** The relationship between parental smoking and lower respiratory tract infection has been firmly established in over 20 reports reviewed in the US. The estimates of the effect of ETS exposure in the home are very consistent and most marked in infants and toddlers. In China and New Zealand exposure to ETS in infants aged 0-18 months is strongly associated with increased risk of hospitalisation for respiratory illness.

***Middle ear disease:*** Upper respiratory health problems are strongly associated with exposure to ETS. Reviews of studies in the US and UK between 1986 and 1997 conclude that exposure to ETS is a cause of both acute otitis media (middle ear effusion with infection) or serous otitis media (effusion without infection). This finding indicates that there is a large preventable burden of both acute and chronic illness middle ear damage and deafness in children due to long term exposure to ETS.

***Asthma:*** *The first question is does ETS cause aggravation of health problems in people with asthma?* In its 1992 review the US Environmental Protection Agency concluded that “passive smoking is causally associated with additional episodes and increased severity of asthma in children who already have the disease”. (There is evidence from several studies that exposure to ETS may also affect the severity of asthma in adults.)

*The second question is does ETS a contributory cause of asthma in children?* In both the US and UK critical reviews, the panels concluded that there is convincing evidence of “a strong and consistent association between exposure to ETS and development of childhood asthma”.

The UK Department of Health report from the Scientific Subcommittee On Tobacco and Health (SCOTH) concluded that parental smoking increased the risk of asthma in schoolchildren as well as infants.

The California Environmental Protection Agency 1997 report which was endorsed and released by the US National Institutes of Health, National Cancer Institute in 1999 (December), supported these findings after a further critical review of scientific

reports. It added that “there is likely to be a subpopulation of asthmatics who are especially susceptible to ETS exposure.”

**Lung growth:** In the most sensitive and formative stage of their lives children’s growth may be affected by exposure to many environmental influences. Several reports describe impaired lung growth in children exposed to ETS from maternal smoking. These effects, although relatively small, do represent a form of injury which may have long term implications for respiratory health and which can be easily prevented.

### **Chronic pulmonary disease and respiratory symptoms in adults**

For 20 years surveys of non-smokers have shown reductions in lung function associated with chronic workplace exposure to ETS and other exposures to passive smoking. For self-reported symptoms of breathlessness, phlegm production and wheezing. Some studies have reported non-significant findings but most show a trend in reduced lung function and increased symptoms.

A study in Beijing (1995) showed a very strong effect of passive smoking on lung function and in Singapore (1993) increased risks were found for all respiratory symptoms with exposure to one or more “heavy” smokers (>20 cigarettes/day); for exposure to “light” smokers (<20 cigarettes/day) increased risk remained for chronic cough.

Although there has previously been doubt as to whether involuntary exposure to passive smoking causes chronic lung disease in otherwise healthy individuals, there more recent studies clearly indicate that toxic exposures result from passive smoking and are associated with both reduced lung function and chronic respiratory symptoms.

It is also important to remember that, from a public health viewpoint, we are concerned with the whole spectrum of health damage from passive smoking which in adults includes heart disease and stroke in addition to respiratory illness.

### **Is passive smoking a cause of ischaemic heart disease?**

The conclusion of a recent comprehensive review and analysis of the world’s literature on passive smoking and the risk of heart disease concluded that “*breathing other people’s smoke is an important and avoidable cause of ischaemic heart disease*”. It was estimated that the increased risk is 23% and a recent independent study in the US arrived at the same estimate. The US National Institutes of Health report (1999) concluded on the basis of collective evidence that passive smoking was associated with an overall risk of 30% for ischaemic heart disease.

The observed effect, in terms of increased risk, is relatively larger than might have been expected at relatively low doses but there is a very plausible biological explanation for this involving the mechanisms which cause clotting of blood, damage to blood vessel walls and to circulating blood lipids. Because the risk is high at low exposures and because heart disease is very common in the community, the prevention of passive smoking should be regarded as an important target for the prevention of heart disease.

## **New evidence on passive smoking and stroke**

Few investigations have so far been conducted on the association between passive smoking and stroke. However a recent (1999) report from New Zealand found a major independent effect on the risk of stroke. The estimated increased risk was 110% for men and 66% for women.

The evidence for a serious harmful effect on the cardiovascular system, by passive smoking, is consistent across different countries, populations and investigators.

## **Is passive smoking in young people a risk for future cardiovascular disease?**

The indications are that passive smoking exposures in children and young people initiate damage to tissues which may later lead to clinical disease. In 1996, a US study of healthy teenagers and young adults, who had no known risks for cardiovascular disease, showed that the normal function of main blood vessel walls was significantly impaired in those exposed to passive smoking of one hour a day or more.

Passive smoking in children is associated with raised blood lipid levels. In another report young adults' exposure to secondhand smoke was associated with a breakdown in the body's antioxidant defense leading to increased damage to blood lipids – a recognised increased risk for ischaemic heart disease.

## **Passive smoking and lung cancer**

The association between passive smoking and lung cancer has so far attracted most attention in the media although it represents one of the smaller adverse health effects of ETS.

The recent (1999) US National Institutes of Health report concludes that, taken together, the global literature points to a causal association with an excess risk of 20%.

In a comprehensive study published in the British Medical Journal (1997) an analysis of 4626 cases of lung cancer in non-smokers, documented in 37 different reports made an estimate of a 26% excess risk.

This UK (1997) review makes the important point that cancer causing substances in tobacco smoke which are inhaled pass into the blood circulation where they can be measured. They are also excreted in the urine. *“It is therefore to be expected that exposure to environmental tobacco smoke causes cancer”*.

The key messages for both the workplace and the home from this study included:

- There is a dose-response relationship between a non-smokers risk of lung cancer and the number of cigarettes and years of exposure to smokers
- A woman who has never smoked has an estimated 24% increased risk of lung cancer if she lives with a smoker.

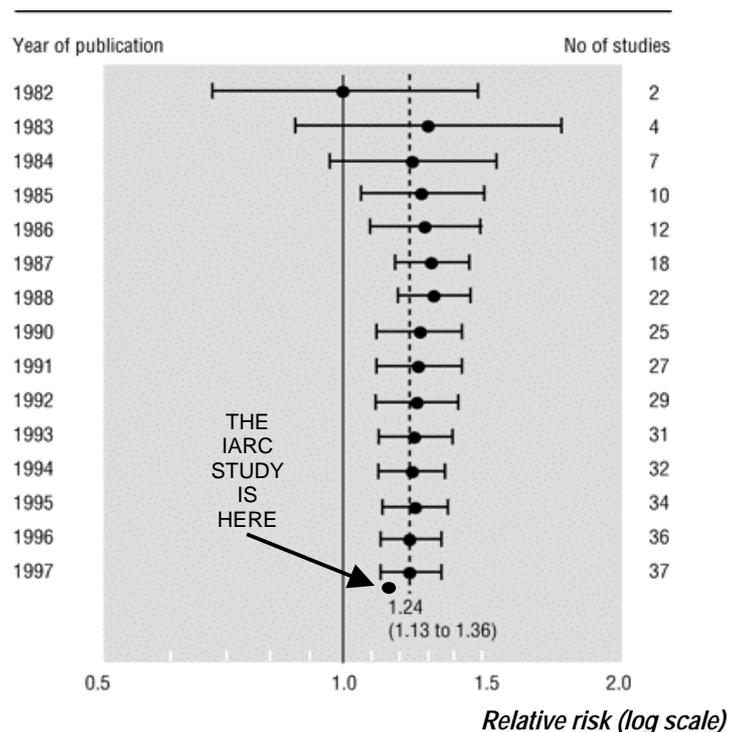
## The overall weight of evidence and tobacco politics

None of the important causal relationships described in this paper are based on a single study. By the same token the majority of independent and intellectually honest public health scientists would not agree that the evidence of causality should be discarded on the basis of a single non-significant finding.

This is important when we consider the politics of environmental tobacco smoke. The tobacco industry has consistently sought ways of rebutting and discrediting the evidence accruing from health outcome studies in passive smokers. This activity has often focussed on the relatively smaller excess risks such as those associated with lung cancer and heart disease. The industry has recruited many scientists from academia and the private sector in an attempt to give credibility to its arguments about the evidence on ETS exposure and damage to health.

As an example, in 1998 the tobacco industry orchestrated a major media campaign about the results of a European study which examined the risks of passive smoking (a) in childhood; (b) spousal exposure and (c) workplace exposure. The study findings were not statistically significant but the authors themselves state that the estimated excess risks for lung cancer for spousal exposure to passive smoking (16%) and workplace exposure (17%) are consistent with other studies in Europe and the USA.

One factor in the lower estimate of risk is “a result which could be explained by the large number of subjects whose exposure to ETS ended several years earlier”. This study was conducted by the International Agency for Research on Cancer (IARC). The Figure below places the IARC findings in the framework of all reports on passive smoking and lung cancer. This result is where we would expect it to be if it was true – that is within the confidence interval of the estimate derived from 37 other studies.



## What is the evidence on the harm of passive smoking in Hong Kong?

### Exposure of young children in Hong Kong

Exposure levels for passive smoking are very high. Three large surveys between 1989 and 1998 have shown that half of our primary and secondary school students breathe tobacco smoke in their home:

Year	Survey	% exposed
1989	13,000 students in Primary 3-6 in Kwai Tsing and Southern Districts	49%
1994	6,000 students Form 1-3 in a random sample of secondary school classes	50%
1998	3,964 students Primary 3-6	48%

### Passive smoking is strongly associated with hospitalization of young children.

In a 1995 report 225 children aged 6 months to 7 years, admitted to Queen Mary Hospital in 1994, were compared with 215 well children in randomly selected households. The excess risk for hospitalisation in those exposed to passive smoking was 192%.

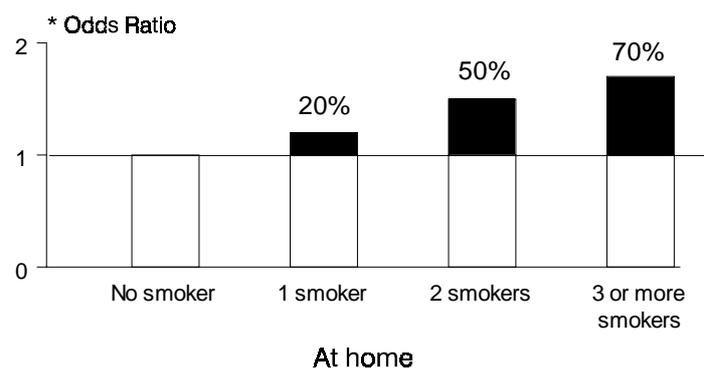
It is clear from the overall body of evidence that hospitalisation is only the tip of an iceberg of health problems in young children exposed to passive smoking.

### Chronic respiratory symptoms in children

In 1989-92, surveys of primary school children consistently showed that exposure to passive smoking in the home led to chronic symptoms of cough, phlegm and wheeze. (These health problems in children from smoking homes did not improve when ambient air quality was improved following restrictions on the sulphur content of fuel in Hong Kong).

In 1994 a random sample of Form 1-3 students (aged mainly 12-15 yrs) showed that in this older group living with smokers damaged their respiratory health. The more smokers in the home, the greater the damage.

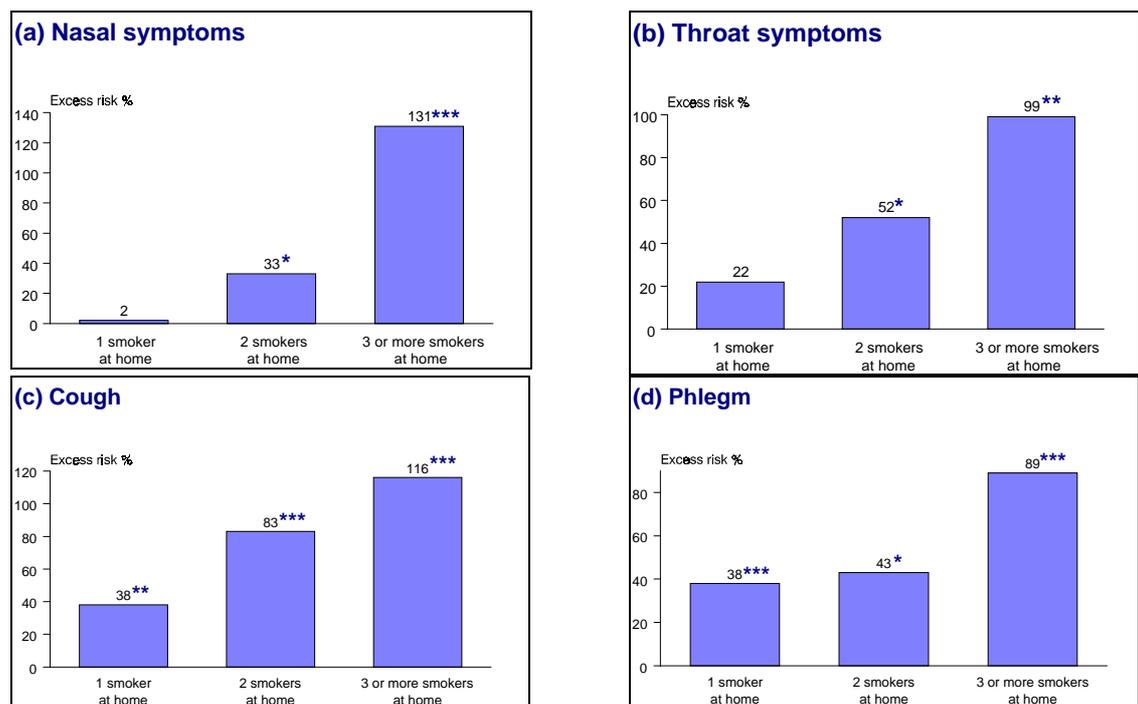
### Excess risk of any respiratory symptoms in never-smoking students by number of smokers at home



\* Age and sex adjusted

In 1998, the evidence on health impairment in primary school children was strengthened. In an SAR wide random sample of schools and classes a group of 3964 children were studied. The excess risks for nasal and throat symptoms, cough and phlegm are shown in the figure.

**Excess risk of respiratory ill health due to passive smoking at home in never-smoking children**



\* p<0.05, \*\* p<0.01, \*\*\* p<0.001  
 Test for trends for all the above: p<0.001

Again there is a strong association between the number of smokers in the child's home and the pattern of respiratory ill-health.

**The cost of passive smoking to families**

In Kwai Tsing and Southern Districts we examined the costs of children's doctor consultations for cough, phlegm and wheeze, for those who lived in smoking homes.

The excess risk of doctor consultation was 15% for those living with 1 smoker and 38% for those with 2 smokers in the home.

Based on a consultation fee of \$120 the estimated annual avoidable direct cost of medical care for children aged 0-12 years, ranges from a minimum of \$2.7m to \$7.9m.

## **Exposure of adults, including workers, to passive smoking in Hong Kong**

Many of the analyses which formed the basis of the “Harvard Report” *“Improving Hong Kong’s Health Care System: Why and For Whom?”* were based on a representative household survey of 5738 subjects.

In a weighted sample of 4235 the responses to questions about exposure to passive smoking at home and work have recently been examined. Among the full time workers 54% were exposed to passive smoking at work; among the non-smokers 47% were exposed at work. The 1996 by-census gives 3,182,497 as the number of working males and females. If 76% do not smoke (as declared in the Harvard Survey), then we have 2,418,698 non-smoking workers and 1,136,788 of them exposed to ETS.

- We estimate that they generate an extra 909430 doctor consultations per year for respiratory complaints.
- If the average cost of a consultation was \$120 then direct out of pocket costs would be \$109 million per year in full time non-smoking workers alone.
- If one doctor can see 16560 patients a year then the extra ETS attributable medical work in primary care is equivalent to 55 additional doctors.

### **Passive smoking in an adult workforce: the short term costs**

The impact of passive smoking on health care utilisation has been examined in a large public sector workforce in Hong Kong. In this group 5142 were non-smokers and 80% were exposed to ETS at work despite the presence of smoking bans. There was a high excess risk for 12 combinations of respiratory symptoms, including cough, phlegm, wheezing and nasal symptoms. The excess risks ranged from 39% to 122% and showed an increasing trend with the number of smokers nearby.

In the 5142 non-smokers there was also a strong association between time exposed to ETS and

- Doctor consultations
- Use of medicines
- Time off work

In this group of workers it was estimated that the avoidable costs of ETS exposure included

- 17% of doctor consultations
- 39% of sick leave

### **Lung cancer in never-smoking women in Hong Kong**

There are four studies on this issue in Hong Kong, carried out between 1982-87. The US EPA included them in its 1992 report and calculated that the excess risk was about 60%. In the 1997 review in the British Medical Journal eight studies from China were analyzed together with the four from Hong Kong; the excess risk was 22%.

## Prevention of passive smoking in restaurants and bars

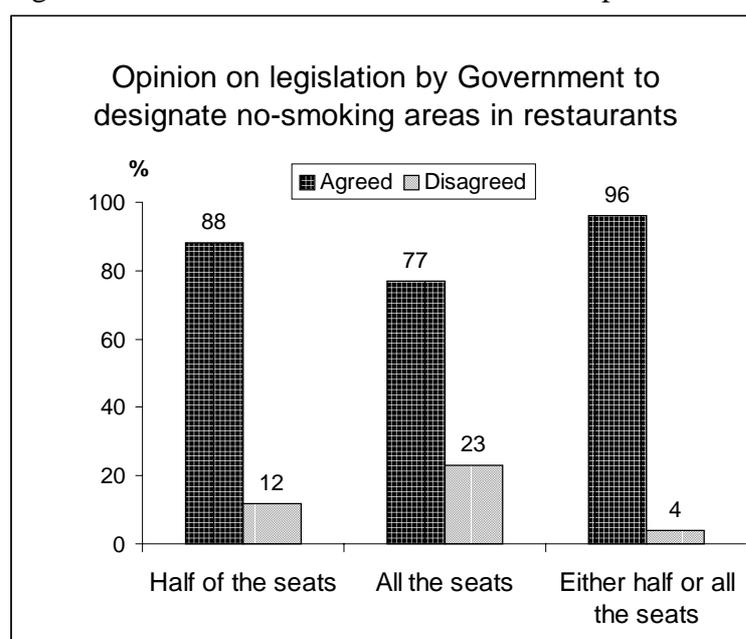
The evidence on the risks of health damage from passive smoking has led to world wide campaigns for complete separation of smokers from non-smokers in all public places, including catering establishments. Complete smoking bans have been implemented in New York and California and in communities in British Columbia, Colorado and Massachusetts. Smoking bans as part of clean air ordinances are now proposed for many other communities around the world.

The tobacco industry claimed that these public health measures would result in economic chaos with 20-40% drops in business. However several objective independent studies have shown *no* impact on restaurant revenues after New York City and several communities in Massachusetts passed such ordinances. There are now published data on restaurant sales for 81 localities, in six US states, 67 of which are 100% smoke-free restaurants. *They have used objective sales tax data to assess economic impact.*

In California, where restaurants (1995) and bars (1998) have become non-smoking, the impact of a smoke-free workplace on workers health has been measured. In a report published by the Journal of the American Medical Association a study of catering workers in bars showed a significant improvement in their respiratory health after the elimination of ETS exposure.

### Surveys in Hong Kong (1995) show a very high level of demand for smoke-free restaurants

In 1995 a representative SAR-wide sample of Chinese speaking respondents supported a proposal for Government legislation to designate no smoking areas in restaurants. 96% of the respondents would vote for either half or all of the seats to be non-smoking. Further details are available in COSH Report No 3.



A new survey by COSH on public opinion and smoking in restaurants is underway and will be reported in 2000.

## **The ASHRAE (1999) Revision of criteria for indoor air quality standards**

Many of the old arguments for a more permissive approach to smoking indoors were based on the assumption that improved ventilation could compensate for smoking. However experts at ASHRAE, the *American Society of Heating, Refrigerating, and Air-Conditioning Engineers* have changed their minds about smoking and indoor air quality. Their old standard suggested that appropriate and safe indoor air quality standards might be met even if some level of smoking was permitted.

Recently, however, they voted to eliminate all reference in the body of the standard to smoking being permissible. On June 20, 1999, the ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Board of Directors approved Addendum e to ANSI/ASHRAE standard 62-1989. This addendum eliminates all reference in the body of the standard to smoking being permissible, and makes clear that the ventilation rates approved in 1989, and still the governing standard, are based on a totally nonsmoking environment. *The rationale for this decision is that ETS is a known carcinogen, and there are no thresholds for safe exposure recognized by the authorities.* (Source: Full text can be found at <http://ash.org>)

Smoke does not recognize non-physical boundaries. It is clear that where any smoking is permitted indoors it must be in sealed, separately ventilated and extracted areas which have negative pressure with respect to their surroundings.

## **Conclusions**

- For anyone to be near the lighted end of a cigarette or cigar is a major health hazard.
- The continuing exposure of children to passive smoking in the home and public places in Hong Kong is a form of child abuse.
- The exposure of people to ETS in their workplace amounts to social negligence and a failure of our public health system.

## **Recommendations**

Hong Kong needs a comprehensive strategy to eliminate the health risks of passive smoking in the home, public places and the workplaces.

The prevention of passive smoking should be seen as a high public health priority which needs to be addressed through a multisector approach involving agencies responsible for public health, labour and environment, together with the disciplined services.

There should now be a clear line of management between the scientific evidence of harm to health, health education, codes of practice, legislation and its enforcement. At present all of this is lacking.

## **Advocacy and Action**

### ***Enforcement***

- Current legislation must be enforced. There is widespread evidence that management of buildings, transportation services, recreational venues (cinemas) and catering establishments are unable or unwilling to enforce the present ordinance. There is a lack of signage, monitoring and appropriate action on infringement.

### ***Prevention of passive smoking at home***

- We need a major public education programme to prevent ETS exposure in the home
- We must recognize the sanctity and privacy of the home but
- We must invest resources and skills to reduce the epidemic of health problems from passive smoking in domestic environments

### ***Prevention of passive smoking at work and for all adults***

- Joint action by Labour Department, the Occupational Safety and Health Council, Department of Health
- Guidelines on Indoor Air Quality – rewritten and strengthened IMMEDIATE
- Approved Code of Practice URGENT
- Underpin the public health advocacy with new legislation STRATEGIC PLAN

**Voluntary arrangements for the prevention of passive smoking have not worked elsewhere and are unlikely to work in Hong Kong.**

**Postscript: Public health in Hong Kong must not be deflected by disinformation.**

Despite many years of knowing that ETS contains higher concentrations of chemicals such as HCN, NH<sub>3</sub> and nitrosamines the tobacco industry has refused to acknowledge any danger to non-smokers.

The industry has worked hard to:

- cast doubt on major scientific reports
- broaden the issue to encompass total indoor air quality
- hide behind “credible” third parties paid by the industry
- fought further public health measures to protect non-smokers (and workers)
- tried to convince the general public that there was a “controversy” about whether ETS is dangerous or not – when there is really no controversy at all.

The evidence for harm from passive smoking is overwhelming and an ethical approach to public health policy demands that we now take effective action to prevent it.