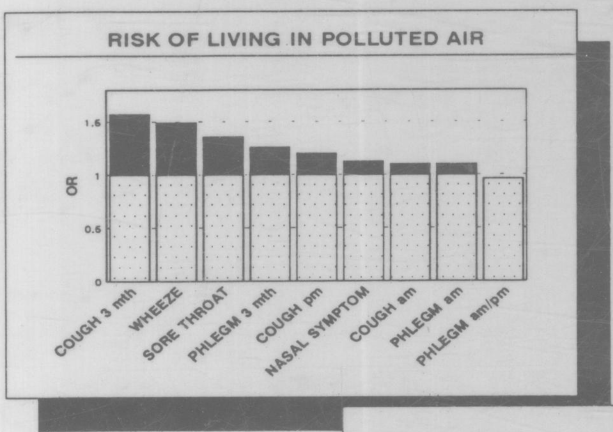
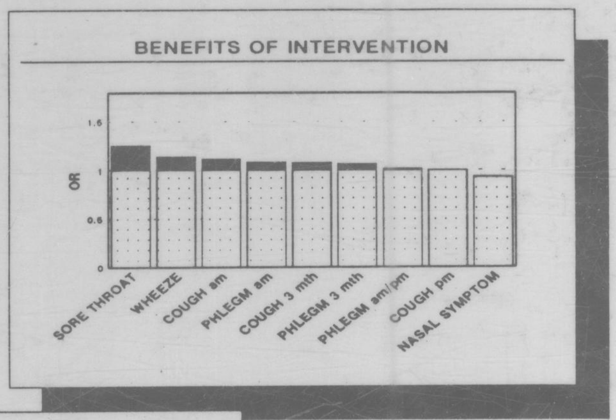
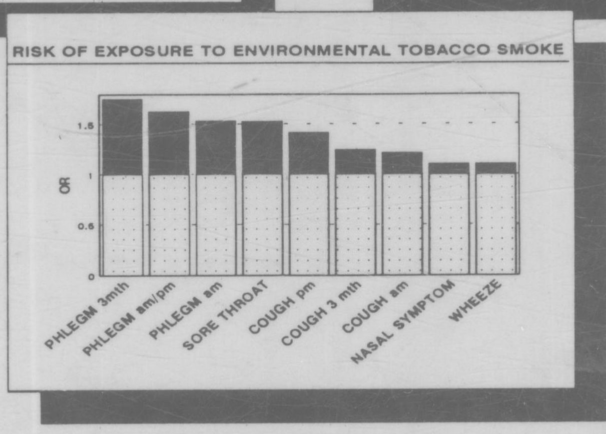
AIR POLLUTION AND RESPIRATORY HEALTH IN PRIMARY SCHOOL CHILDREN IN HONG KONG, 1989-1992







REPORT TO THE ENVIRONMENTAL PROTECTION DEPARTMENT

STUDY ON RESPIRATORY HEALTH AND THE EFFECTS OF AIR POLLUTION IN HONG KONG:SEPTEMBER 1993

香 港 大 學

THE UNIVERSITY OF HONG KONG

DEPARTMENT OF COMMUNITY MEDICINE

AIR POLLUTION

AND

RESPIRATORY HEALTH

IN PRIMARY SCHOOL CHILDREN

IN HONG KONG, 1989-1992

OTHER PUBLICATIONS

Interim results from this study have been reported in the following publications and presentations:

11th Asia-Pacific Congress on Disease of the Chest, Bangkok 1989

SEP-SEPCR Meeting, London 1990

Environmental Health Conference, Dundee 1990

The Science of the Total Environment, 1991;106:121-135

The role of ASAIHL in combating health hazards of environmental pollution, The University of Hong Kong 1992

3rd National Symposium on Smoking and Health, Beijing 1992

8th World Conference on Tobacco and Health, Buenos Aires 1992

Conference on Injury Prevention in Childhood, Hong Kong 1992

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AIR POLLUTION AND RESPIRATORY HEALTH IN PRIMARY SCHOOL CHILDREN IN HONG KONG, 1989-1992

EXECUTIVE SUMMARY

INTRODUCTION

This report presents the results of a four year study of the respiratory health of primary school children in two districts of Hong Kong, Kwai Tsing and Southern, which have differing air quality.

OBJECTIVES

The objectives of the study were to;

1. determine if there were any measurable differences in the respiratory health of children living in Kwai Tsing and Southern Districts
2. identify the most important risk factors for respiratory health problems in these children,
3. assess the impact of the implementation of the Air Pollution Control (Fuel Restriction) Regulations in July 1990 on the respiratory health of these children,
4. predict future patterns of respiratory health problems of children living in Kwai Tsing and Southern districts,
5. provide information to support policy-making related to the improvement of the health of the Hong Kong community.

SUBJECTS AND METHODS

Study population: All children in primary 3 to primary 6 classes, attending fifteen schools in Kwai Tsing and Southern Districts. Schools were selected primarily on the basis of their location in an area of low, medium or high air pollution and their proximity to an air monitoring station.
Methods of enquiry: The research techniques included questionnaire surveys of all children and their parents, and lung function and histamine challenge tests on a subgroup of the total population studied.
Analysis: Data analysis was conducted using standard statistical techniques; chi square tests, t-tests, logistic regression and modelling. Confidence intervals and levels of significance are quoted for statistical tests.

RESULTS

1. Risk factors for respiratory health:

A number of socioeconomic and demographic factors were associated with respiratory health problems in these children. These risk factors included

younger age,
being a boy,
having parents with a lower educational attainment,
living in Kwai Tsing,
living in a home where family members smoke.

2. The 'District Effect':

After adjusting for socioeconomic and demographic factors there was an excess risk of *cough for three months*, *sore throat*, *nasal symptoms*, and *wheeze* in children living in Kwai Tsing District compared with children living in Southern District.

3. The 'Intervention Effect':

The effect on respiratory health of the improvement in air quality in the territory, the 'intervention effect' was studied. Following the implementation of the Air Pollution Control (Fuel Restriction) Regulations in July 1990, the excess risks of subjective respiratory health problems found for those living in Kwai Tsing, were reduced. In 1991/92, there was a residual risk for one symptom only, *wheeze*, if the children lived in Kwai Tsing District.

The histamine challenge test, used as a non-specific indicator of bronchial reactivity, showed a decline in bronchial reactivity in non-wheezing/non-asthmatic subjects tested before and after the introduction of the low-sulphur fuel regulations. These findings support the results of the questionnaire-based enquiries on respiratory symptoms of a reduction in respiratory health problems.

4. The 'Exposure to environmental tobacco smoke effect':

There are excess risks to children of experiencing a range of respiratory health problems if they live in a home where at least one of the family members smokes. For the individual child who is exposed these excess risks are greater than those from air pollution alone. In contrast to the risks of living in Kwai Tsing, the risks associated with environmental tobacco smoke did not decline during the four year period of the study.

5. Population Attributable Risk:

For children living in Kwai Tsing, the population attributable risk, that is, the fraction of the total health problem in the population, was as high as 27% for *cough for three months* in 1989/1990 but reduced to 8% for *morning cough*, after the air pollution control, in 1991/1992.

Given a reduction in exposure prevalence of 50% to air pollution of the type existing in Kwai Tsing before July 1990, *cough* would be prevented in 431 children aged 8-11 years living in Kwai Tsing, and 5660 children of the same age, living in Hong Kong. For children aged 0 to 11 years, using the same estimates of risk, (a conservative approach because children tend to shed their risk as they get older), a symptom such as *cough* could be prevented in 1,152 children living in Kwai Tsing and 15,218 in Hong Kong.

For children living in a home where members of the family smoke, the population attributable risks were as high as 28% for *phlegm for three months* in 1989/1990 and similarly 24% in 1991/1992 for *morning cough* indicating the potential health gains if families ceased to expose young children to tobacco smoke in the home.

CONCLUSIONS

The findings from this study suggest that there are two important avoidable hazards for childhood respiratory health problems in ambient air (industrial and other pollutants) and indoor air (environmental tobacco smoke) in Hong Kong.

The overall weight of evidence includes these salient features:

- the strength of the association between exposure to the hazard and the presence of respiratory health problems,
- the decline in the estimated risk of living in a polluted area following the July 1990 intervention in the form of low-sulphur fuel regulations
- the decline in estimates of bronchial reactivity, as measured by the histamine challenge test
- the persistence of the risk associated with exposure to environmental tobacco smoke throughout the pre- and post-intervention period.

The low-sulphur fuel regulations are associated with a reduction of estimated excess risks, for cough, phlegm production, sore throat and wheezing, of the order of 29%. When these findings are applied to the child population of Hong Kong, aged 0-11 years, then it is postulated that respiratory complaints and doctor consultations would be avoided in 7,675 (for a 20% reduction in exposure) up to 18,384 (for a 50% reduction in exposure), if air quality controls were maintained. There is scope for further improvement in that some residual excess risk associated with residence in Kwai Tsing is observed after the intervention.

For the children who are exposed to environmental tobacco smoke by household members, additional health gains would be achieved by cessation of smoking in the home. The population at risk (and therefore the preventable fraction) is large in that between 44% (Southern) and 50% (Kwai Tsing) of children live in smoking families.

RECOMMENDATIONS

The prevention of respiratory health problems in primary school children in Hong Kong requires an intersectoral approach embracing:

- **air quality control**

  and prevention of exceedances of air quality objectives by SO_2, NO_x, and particulates,

- **health promotion in the home**

  and prevention of the exposure of young children to environmental tobacco smoke

- **tobacco control and effective health education for young people**

  and the prevention of active smoking by children aged 7 to 14 years.

1

INTRODUCTION

'I durst not laugh, for fear of opening my lips
and receiving the bad air'.
Shakespeare, (1599-1600), Julius Caesar

'The government's main policy objective is to achieve a set of air quality goals established to protect human health for seven major air pollutants.'

Environmental Protection Department 1993

1. INTRODUCTION

1.1: AIR QUALITY IN HONG KONG

People need a continuing supply of food, air and water in order to exist, but they need uncontaminated food, pollutant-free air and clean water if they are to remain alive and healthy. Assorted chemicals are emitted into the air from both natural and man-made sources and many of these are potentially detrimental to health. The impact of air pollution is broad, ranging from the direct clinical manifestations resulting from the inhalation of chemicals in an individual to contamination of the biosphere which affects the health of whole populations.

Hong Kong like a number of other cities in south east Asia, such as Bangkok, Manila and Tokyo, and centres in China and eastern Europe, has an air quality problem. Recognition of the problem resulted in the declaration of the first two air pollution control zones in 1986, followed by the Statement of Air Quality Objectives (AQO) for these two zones, which came into effect in 1987. At the end of 1992, Hong Kong had thirteen air quality monitoring stations, with one more in the process of being set up[1].

To safeguard the health and well-being of the population AQOs have been established for seven urban air pollutants: sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), total suspended particulates (TSP), respirable suspended particulates (RSP) and lead[1]. Acceptable permissible levels of these air pollutants both in the short term, i.e. within one hour, and in the long term, a period of one year, have been specified. These levels are for individual pollutants considered in isolation, but some combinations of these chemicals in ambient air can have additive, synergistic or antagonistic effects on health. Exceedences of these AQOs are, unfortunately, not uncommon although there has been some considerable improvement in the last two years. SO_2 levels fell dramatically (by 84%) after the enactment of the Air Pollution Control (Fuel Restriction) Regulations[2] in July 1990. TSP and RSP levels also fell by 19% and 23% respectively[1]. Finally, although objectives have been set, there is also a problem in determining concentrations of these pollutants below which no significant health effect occurs.

Many people appear to be concerned about the effects of the environment upon their health. In 1991, the EPD received 6480 complaints about pollution of the environment, 2578 of these (40% of all complaints received that year) related to air pollution. A similar number, 2634, were received in 1990 although this was only 30% of the total. In addition, the number of complaints relating to vehicular emissions increased from 767 in 1990 to 1161 in 1991[1,3]. However, in a study on health perceptions of members of the general population, carried out by telephone questionnaire in 1990, only 4% stated that a change in the 'environment' would allow them to enjoy better health[4].

1.2: THE POLLUTANTS

Particulates

Airborne particulates are a complex mixture of organic and inorganic substances and are defined according to size and composition. Large particles, those above 100μm in diameter, tend to settle out and produce dust but particles smaller than 100μm remain suspended in air, giving rise to the fraction TSP. Particulates smaller than 10μm in diameter are known as RSP and these are further subdivided into: coarse particulates, 2.5-10μm in diameter, such as those producing black diesel smoke and dust; fine particulates, less than 2.5μm in diameter, which contain secondarily formed aerosols, combustion particles, recondensed organic and metallic vapours. Particulates 0.1-1μm are responsible for visibility-reducing hazes.

In general, the main sources of particulates are natural and include volcanic activity, salt aerosol from the sea, soil blow off, pollen grains, fungal spores, and other organic matter. With no area of Hong Kong being more than 2km from the sea, salt spray is a major source of particulates in Hong Kong. However man-made activities in construction, mining, earth moving and use of carbon-based fuels, especially for motor vehicles, contribute considerably to airborne particulate levels. In Hong Kong, in 1991, motor vehicles contributed 51% of the overall emissions of TSP, with diesel vehicles emitting 98% of these[1]. In addition, in places where leaded fuel is still used, and Hong Kong is one of these, lead particulates produced by the combustion of alkyl lead, an additive in petrol, contribute 80-90% of all lead emissions in the atmosphere. Other major products of vehicle combustion include hydrocarbons.

Sulphur dioxide (SO_2)

The major source of SO_2 in air is man-made from the burning of high sulphur content fuels (coal, oil) in industrial furnaces and power plants (for energy generation) and in motor vehicle combustion (primarily diesel powered). SO_2 in the presence of certain metal catalysts and cold moist air forms sulphuric acid and under certain weather conditions, particulates and SO_2 give rise to industrial or winter-type smogs.

Nitrogen dioxide (NO_2)

The major sources of nitrogen oxides are natural and include bacterial and volcanic action and lightning. Man-made emissions are from the combustion of fossil fuels in power plants, gas-fueled appliances, e.g. domestic cookers and heaters, oil stoves, and motor vehicles, primarily diesel powered ones. Last year, vehicles in Hong Kong were responsible for 75% of NO_2 levels, with diesel vehicles producing 82% of this[1].

Carbon monoxide (CO)

This is produced from the incomplete combustion of carbon containing materials and in some industrial and biological processes. Total emissions of CO to the atmosphere equal or exceed those of all other pollutants combined[5]. Petrol-fueled vehicles are a major source of CO. Indoor CO sources include unvented combustion appliances, such as water heaters.

Ozone (O_3)

Ozone is produced, at ground level, from the atmospheric reaction of hydrocarbons and nitrogen oxides (mainly from vehicle exhaust emissions) stimulated by the action of sunlight. It is one of the more biologically active pollutants in photochemical smogs. These smogs are common in summer in places which have sunny climates and high levels of dense traffic, e.g. Los Angeles, Athens, and Sidney, although both industrial and photochemical smogs can co-exist in a given area at the same time. Ozone exposures in summer-type episodes usually follow a typical diurnal pattern with peak concentration in the afternoon and low levels during the night and early morning.

Ozone also plays an important role in accelerating the photochemical conversion of SO_2 into sulphuric acid in sunny conditions in the presence of nitrogen oxides and hydrocarbons.

Factors affecting pollutant levels

Ambient pollutant levels are affected by rainfall, wind speeds and currents, atmospheric inversion, and man-made activities. Low wind velocities hinder horizontal dispersion and high pressure and temperature inversions limit vertical dispersion. Local geographical features are also a contributor. Hong Kong's weather patterns result in elevated levels of pollutants in the winter months because of reduced rain and wind and increased build up of inversion layers in the atmosphere.

1.3: HEALTH RISKS

Air pollutant effects

Concern over levels of pollutants arises because of the adverse health effects demonstrated both directly on the airways and indirectly, by their presence in ambient air. Most individuals will react with significant symptoms to the challenge of large amounts of dust, high levels of water-soluble gases, e.g. SO_2, or extreme temperature changes. The symptoms produced include nasal irritation, sneezing, moderate discharge and some mucosal congestion[6].

All of these air pollutants not only constitute independent risks, they also act synergistically with other factors. For example, gaseous acid pollutants can be adsorbed onto the surface of particulates and carried into the lungs. It is difficult to separate out the effects of individual pollutants upon health but collectively an increased risk of respiratory symptoms has been demonstrated for young children living in a city with high levels of air pollutants[7] and a correlation with increased hospital admissions for asthma with exposure to any of several of the major air pollutants[8]. As further confirmatory evidence of the ill effects of air pollutants upon health, lung function has been shown to improve following a sustained reduction in air pollution levels[9].

Particulates

Particulates are inhaled into the respiratory system and, depending upon size, penetrate to a greater or lesser extent as far as the lower respiratory tract (TSP) and into the alveoli (RSP). In normal breathing, particulates larger than 10μm are deposited in the proximity of the glottis, 2-

10μm in the bronchioles, and smaller than 2um in the alveoli, although mouth breathing, as in exercise or when speaking, produces greater deposition of larger particles in the bronchioles. Materials that dissolve the mucus of the airways or the surfactant layer in the alveolar region diffuse into the underlying epithelia and blood stream, thereby gaining access to other body tissues where they may cause chronic damage, e.g. in the liver, spleen, kidneys. In addition, any particulates carried by ciliary action up out of the upper respiratory tract may be swallowed and pass into the body via the gastrointestinal tract.

The effects of particulates on respiratory health are both short and long term. In children, they cause local irritation, with cough, bronchitis and chest illness[10,11] and higher admissions to hospital for bronchitis and asthma in preschool children[12]. High levels of TSPs are associated with increased mortality[13]. Pulmonary changes include reduced lung function in both children and adults[14,15].

Some particulates have specific effects on the body, e.g. lead. Thirty to 50% of inhaled lead particulates are ultimately absorbed by the body and pass into the blood stream. High levels of lead in blood can result in reduced haem synthesis in adults and children[5] and have been shown to reduce children's IQ by 4.4 points[16].

In addition, some other specific particulates are probably or possibly carcinogenic; the sources include diesel and petroleum exhausts (lung[17,18], bladder[18]), chromium dust (lung), and asbestos (lung cancer, mesothelioma).

Sulphur dioxide

SO_2 is a respiratory irritant. An increased prevalence of pneumonia, asthma and respiratory infections in the first two years of life has been found in children living in areas with higher levels of SO_2[19]. In addition, increased levels of SO_2 are associated with increased mortality[19], specifically respiratory deaths[20] and a reduction in SO_2 and an improvement in ambient air quality has been followed by a subsequent decline in mortality figures[21].

Observed effects of winter-type smog (primarily SO_2 and particulates) include transient changes in pulmonary function, increased morbidity among chronic bronchitics, increased hospital admissions due to respiratory and cardiovascular conditions and depending upon the severity and nature of the exposure, an increase in mortality[22], as demonstrated in the London smog of 1952[23].

Nitrogen dioxide

Exposure to NO_2 is associated with reduced pulmonary function[24,25] but it has proved difficult to determine respiratory effects from the low levels of NO_2 which exist in ambient air. Therefore a number of studies have considered the respiratory health effects from exposure to higher levels of NO_2 which exist inside buildings, where combustion of fossil fuels occurs, e.g. use of gas appliances. The effects on respiratory health of indoor levels of NO_2 have produced conflicting results ranging from no health effects[26,27] to increased prevalence of respiratory symptoms and respiratory illness in children[28].

Carbon monoxide

Health effects associated with CO include decreased physical performance, increased angina attacks in angina sufferers, diminution of visual perception, manual dexterity, ability to learn and perform sensorimotor tasks[29].

Ozone

This is the main source of the health effects of summer type smogs which cause irritation of the eyes and chest discomfort[30], increased bronchial reactivity[31] and impaired lung function[32].

Indoor air pollutants

The air pollutants already discussed can be found both outside and within a building. There are a number of additional gaseous irritants which are predominantly present indoors. These include volatile organic compounds such as epoxy-resins, formaldehydes, benzene, solvents, radon, and tobacco smoke. Symptoms associated with these pollutants include headaches, drowsiness, nausea, eye and upper respiratory tract irritation, dizziness, skin itching and eruption, difficulty with breathing, and sinus congestion[33]. Also present in indoor air are biological agents including viruses, bacteria, fungal spores, animal dander, and arthropod droppings, all of which may act as allergens and promote a respiratory response. A study of the air quality in street level shops and offices in Hong Kong found levels of CO, RSP, and CO_2 which exceeded the AQOs and may be a hazard to health[34].

However, in many domestic and commercial premises the most important source of indoor air pollution is environmental tobacco smoke (ETS). Sidestream smoke produces one hundred times as many toxic compounds as main stream smoke. These include CO, acrolein, ammonia, nitrosamines, naphthylamine, cadmium, nickel, and polonium. The detrimental health effects of ETS, which have been comprehensively reviewed recently[35], include: cancer of the lung in adults; and in children, increased risk of lower respiratory tract infections, such as bronchitis and pneumonia, increased prevalence of fluid in the middle ear, respiratory tract irritation, a reduction of lung function, and increased severity of symptoms in asthmatics besides being a risk factor for asthma.

Long-term effects

If respiratory health is compromised in childhood, the effects have been shown to continue into adulthood[36,37].

1.4: THE EPIDEMIOLOGICAL APPROACH

Epidemiological studies are useful tools for identifying areas of need and for evaluating the effectiveness of preventive measures, such as legislative control of air pollutants, on health. It is not easy to establish cause and effect relationships in the field of environmental pollutant impact upon health. Large scale well-planned epidemiological population studies can be used to address this problem. To this end, they can collect evidence on factors which are major causes of ill health thus helping to identify areas where effective interventions may be implemented.

However, there are both practical and analytical problems in carrying out epidemiological studies on a sufficiently large scale to assess risk. First, practical problems include resource issues such as number of subjects required to take account of number of people exposed and variation in exposure levels, and gaining access to suitable subjects. A further problem which arises in the assessment of the detrimental effects of air pollution on health is that these effects may be masked in people who smoke or who are exposed to ETS. Second, analytical issues include the methodology employed to estimate the effects of air pollutants on health in population studies.

Epidemiological studies are helpful in providing evidence to assess the health effects associated with exposure to air pollution in a population, although currently most of the studies originate in the west and in other areas of the world, where the pollution mix may be different from that in Hong Kong. The consequent effects on health in response to pollutants in south east Asia remains to be fully documented. All countries need a system of surveillance of both the levels of pollutants and their effects on health. Given this information, the preventable fraction of health problems can be targeted by the health professionals.

To collect such information requires collaboration. A multisectoral approach is needed between regulatory agencies, such as the Environmental Protection Department, which collects and monitors air quality in the territory, public health physicians and other scientists from the Department of Health who collect and monitor health status in the community and academic research units, which can contribute the epidemiological expertise. In every case continual monitoring is needed to obtain good quality intelligence, to identify trends and to evaluate the effectiveness of any controls. Finally the last two steps in the chain of action are education, and legislation where necessary, to establish and enforce the practice of a sound air quality policy.

1.5: EPIDEMIOLOGY, RESPIRATORY HEALTH AND AIR POLLUTION

In the 1970's work began on a series of respiratory health studies in children living in areas with varying levels of air pollution. Occupational risks and active smoking are usually considered to be either absent or at relatively low levels in children and therefore do not confound the results of the investigation to the same extent as they might do in adult studies. This makes the analysis and isolation of the effect due to air pollution more feasible. The WHO European Regional Office initiated the studies on children in 1972 and the report on this work still provides useful guidelines on the approaches which can be taken[38]. They chose populations which were exposed to contrasting levels of air pollution, grouped into high, intermediate and low categories. Children under the age of eleven years were studied to minimize the effects of active cigarette smoking. These studies used a parental questionnaire in the self administered form, together with tests of lung function and a clinical examination of the chest. Objective tests of ventilatory function had previously been shown to be easy to measure and provided a reliable estimate of respiratory health. They can be used to assess the validity of questionnaire responses and to detect evidence of pathological changes in lung function.

The WHO studies concluded that there was a strong association between air pollution and respiratory problems in children. They identified particulates such as smoke and carbon as the most important pollutants together with sulphur dioxide. In those studies it was not possible to identify a threshold in countries with great variation in both type and levels of pollutants. However, in 'clean air' countries no effects of air pollution on the prevalence of respiratory problems were found.

In contrast to the stated advantages of studying children it is also important to recognise that health surveys in well-populations require very large numbers of subjects in order to detect real differences, at a stated level of confidence, in the health status of different groups within the population. Although health problems may affect relatively large numbers of individuals and are therefore important in a social, economic and ethical context, they are likely to comprise only a small proportion of the whole population. This rule applies to most causes of ill health. The demonstration of public health problems, as opposed to the diagnosis of diseases in individuals, is usually therefore a difficult and laborious task to which rigorous epidemiological and statistical methods need to be applied. These studies require adequate resources and support for staff, fieldwork and equipment. Unfortunately too little priority has been given to this type of work and resources are often difficult to obtain for preventive health enquiries in contrast to biomedical science and curative medicine. The studies described in this report are therefore important in that they indicate what can and should be done at relatively low cost, to measure and monitor the health of important and vulnerable social groups in our community.

1.6: BACKGROUND TO THE STUDY

Baseline study 1989-1990

The increasing number of media reports in recent years on the pollution of the environment in Hong Kong reflects the growing concern of ordinary citizens about the impact which pollution has on their quality of life. In 1988, 66% (2046) of all complaints to the EPD were about air pollution[39]. The Kwai Tsing District Board also received many complaints throughout the 1980s about the air quality in several constituencies of the district. The level and frequency of the complaints led to a decision that the Board's Environmental Sub-Committee would undertake to examine possible detrimental effects of poor air quality on the health of the population.

After discussion with the Department of Community Medicine, the University of Hong Kong, outline proposals were drawn up for a population-based enquiry into the respiratory health of people living in Kwai Tsing District, to be conducted over two years.

Earlier studies on air pollution in different countries showed that both high peaks of pollution and long term exposure to lower levels have important effects on mortality and morbidity from respiratory disease. In adults several other factors including cigarette smoking and type of occupation influence the risk of developing respiratory disease. This increases the difficulty of interpreting the data on possible causal associations between respiratory disease and exposure to air pollution. Studies on children provide an opportunity to avoid some of these problems in that relatively few children smoke and occupational exposure will not have occurred.

It was therefore decided that for the baseline study the population would comprise primary school children living in Kwai Tsing District who would be compared with children living in another district with better ambient air quality.

Follow-up study 1991-1992

The Air Pollution Control (Fuel Restriction) Regulations[2] became law in July 1990 and levels of certain air pollutants fell immediately by 84% (SO_2), 23% (TSP) and 18% (RSP) in specific areas of Hong Kong[3] although levels of other air pollutants, i.e. NO_x did not change (**Figures 1.1 to 1.6**).

Following the report of the results for the first year of the baseline study, discussions were held between the EPD and the Department of Community Medicine. The EPD, as monitors of air quality in the territory and instrumental in developing air pollution control legislation, were interested in the impact of such legislation upon respiratory health, particularly in those districts where pollutant levels had, prior to the legislation, been high. The two year follow-up study was therefore designed to answer the question as to whether the improvement in air quality was associated with a reduction in the difference in respiratory problems, between the districts and with an overall reduction in respiratory health risks.

1.7: AIMS AND OBJECTIVES

The principal aim of the initial study was to determine whether residence and schooling in Kwai Tsing was associated with greater adverse respiratory health profiles than in another district of Hong Kong with better air quality.

The study was designed to test the null hypothesis that

> 'there is no difference, in the prevalence of respiratory symptoms, lung function tests and other indicators of respiratory health, between children living in Kwai Tsing and those living in Southern District'.

The objectives of the follow-up study, were threefold:

1. to identify the most important risk factors for respiratory health problems in children and their parents

2. to assess the impact of the implementation of the Air Pollution Control (Fuel Restriction) Regulations[2] on the health of the primary school children living in Kwai Tsing and Southern Districts
3. to attempt to predict future patterns of respiratory problems of Kwai Tsing and Southern primary schoolchildren.

2

METHODS

2. METHODS

2.1: STUDY POPULATION

Baseline study

Selection of study areas and schools: Kwai Tsing District comprised the 'index' survey area and a 'comparison' area was selected on the basis of the following criteria:

the air quality objectives were less frequently exceeded,

it was accessible,

it would be logistically feasible to carry out a survey of school children.

After consideration of several options Southern District was chosen for this purpose.

The sampling frame was defined from a complete listing of all the primary schools in the two study areas, obtained from the Education Department. To this source, information was added on the numbers of children, classes, and daily sessions. In Kwai Tsing, members of the District Board Environmental Working party were invited to rank and group areas of different constituencies in terms of their air quality. This was done using an ordinance map and grid. Schools were then identified in the different levels identified by the ranking procedure. A further selection was made on the basis of schools which were situated close to mobile or fixed monitoring stations operated by the Environmental Protection Department. In Southern District, general enquiries suggested relatively little difference in subjective reaction of residents to variation in air quality between different constituencies. The initial selection of the schools was made on the basis of their representativeness of all schools in the different constituencies of the district, and secondly, in terms of their proximity to the monitoring stations, as far as this was possible. The list of schools selected is shown in **Table 2.1.1**. On completion of the baseline study and before the details of the study were released, a list of the schools was sent to the EPD Air Policy Group, whose members ranked the areas in which the schools were situated on a three point scale from 1 (low pollution) to 3 (high pollution). Schools in the study from Southern District were all in the low pollution category; in Kwai Tsing, one was in the intermediate category, and the remainder were in areas with high levels of pollution.

Recruitment of the schools: A letter was written to each head teacher explaining that the purpose of the study was to carry out a general health survey of children in classes primary 3 (P3) and primary 4 (P4). A meeting was arranged with each head and other staff to discuss practical aspects of the study. All schools agreed to discuss the proposal and eventually all agreed to participate after clarification of safety, confidentiality and ethical issues.

In the second year of the baseline study all the same children, now in P4 and primary 5 (P5), were recontacted and remeasured.

Follow-up study

In the follow-up study the same schools were contacted and the original cohort of children, now in P5 and primary 6 (P6) were remeasured in 1991. In 1992, the final group of these children, now in P6 were measured. In addition, in 1991, all children in P3 and P4 in the original schools were measured. These children were remeasured in 1992, along with the new intake into P3.

The study population was extended in 1991 by adding a further thirty P3 and P4 classes from each of the two areas. This was achieved by recruiting an additional five schools into the study. Selection of these additional schools was on the basis of their location, i.e. those schools which were geographically closest to those already included in the study, thus in an environment of approximately similar air quality. The children from these schools were also remeasured in 1992 along with the new P3 intake.

Letters outlining the aims of the 1991/2 follow-up study and a summary of the results from the first year of the baseline study were sent to headteachers of all the participating schools at the beginning of 1991. This was followed up with site visits by the project leader and research assistant to all headteachers. In 1992, all schools were contacted by telephone and letters of confirmation and information sent subsequent to this.

Figures 2.1 and 2.2 give the location of all schools involved in both studies in Southern and Kwai Tsing districts respectively.

Prior to commencement of the study, formal ethical approval for the study was obtained from The University of Hong Kong, Faculty ethics committee.

2.2 PILOT STUDY

A pilot study was carried out one month before the main survey using all children in P3 and P4 in one school in Southern District. The use of the questionnaire, examination procedures and acceptability of the methods to the children and their parents was reviewed. As a result of the pilot study, several modifications were made to both the instruments and the protocol.

2.3 STUDY DESIGN

The study has both cross-sectional and longitudinal components. The cross-sectional approach treats each calendar year of the study as an independent event and the measurements on all the children measured in each of the four years, i.e 1989, 1990, 1991, or 1992, as independent of those of the other years. This assumption is justified as the repeated measurements are separated by a full year so that the within subject correlations are expected to be small.

The cohort approach comprises all those children who have been measured more than once over the four years of the study. This group includes the children who formed the original subjects in the first year of the baseline study in 1989 when they were in P3 and P4, and who have been followed for a further three and two years respectively. Also included in the cohort are the children recruited in 1991, from both the ten original schools and the five additional schools, who were also followed up in 1992.

The matrix of classes and measurement events can be represented as follows:

1989	1990	1991	1992
P3		P3	P3
P4	P4	P4	P4
	P5	P5	P5
		P6	P6

2.4: METHODS OF INVESTIGATION

Questionnaires

Parent's and children's questionnaires: Information was collected by self-completed questionnaires, one of which was administered to the parents (PQ) and another to the children (CQ). Both were maintained in a similar format over the four years of the study although a few modifications were made in 1990 and further modification and additional questions were included in the 1991 and 1992 versions.

Teacher's questionnaire: During the fieldwork session in each school, all teachers whose classes were included in the study completed questionnaires covering such topics as class absences and personal smoking habits.

Administrator's questionnaire: A questionnaire designed to document any problems with the class and/or specific pupils, and number of students present during the administration of the questionnaire, was also completed by the administrator of the children's questionnaire, at the completion of each classroom session.

Choice of questionnaire: The CQ and PQ were constructed after reference to internationally recognised standard questionnaires. These included the Medical Research Council (MRC) Questionnaire[40], the United States National Heart and Lung Institute (NHLI) Questionnaire, the combined American Thoracic Society and Division of Lung Disease (ATS-DLD-78) version for adults[41] and the European Community Children's Questionnaire (CEC)[41]. Also consulted were questionnaires from the Brigantia study[42] and from the Glasgow study of children's health, knowledge and behaviour[43].

The PQ and CQ were designed to compare the responses of the children with those of their parents. In both sets of questionnaires, questions on the children's respiratory symptoms and perception of the air quality of the home and district were asked. In the CQ it was also decided to explore the smoking habits of the child, his friends and relatives, and his attitude towards smoking in general. In addition, the PQ had sections on parent's education, parent's health, household size and type, nature of fuel used, and smoking habits of the parents and other household members.

Appendix 1 includes copies of all questionnaires used for parents, children, teachers and administrators, for all four years of the study.

Physical health examination

In all four years of the study, two anthropometric measurements were taken on all children: height and weight. In 1989 and 1990, height was measured using a stadiometer, and in 1991 and 1992 using an anthropometer (Holtain) attached to a base built by the University workshop. Standard techniques for measurement were employed throughout the study[44]. Weight was measured using a set of beam balance scales (Detecto-Medic) in 1989 and 1990, and a set of battery-operated digital readout electronic scales in 1991 and 1992. All measurements were recorded with the children wearing light clothing only and no shoes (**Figure 2.3 and 2.4**).

In 1989 each child was given a full chest examination. (**Appendix 2** includes copies of the health check form and parental consent form).

Lung function tests

In 1989 lung function measurements were taken using a peak flow meter (Mini Wright) and a spirometer (Vitalograph) for forced vital capacity (FVC) and forced expiratory volume in one second (FEV_1) (**Figure 2.5**).

Histamine challenge test

In the second year of the baseline study, a histamine challenge test was performed by children in one class from each of P4 and P5 in four schools, two in Kwai Tsing and two in Southern District (**Figure 2.7 and 2.8**). For the follow-up study in 1991/2 a similar format was used, with follow-up measurements on the original cohort of histamine tested children from 1990, plus one additional year P4 class recruited, randomly, from all P4 classes in each of the same four schools. **Appendix 3**, provides details of the histamine challenge test procedure, protocol form, initial and follow-up (after an initial refusal) parental consent forms.

2.5: DATA MANAGEMENT

Data collection

The PQs, with an accompanying letter and envelope for a confidential return, were delivered to all the schools approximately one month before the fieldwork commenced in each school, giving each headteacher flexibility to dispense and collect the questionnaires from the relevant pupils at a time most convenient for the staff.

The CQs were administered by a trained research worker in a classroom setting. Questionnaires were completed in a uniform and standard fashion and at the same rate by all members in the class. There was no collusion between children. Time was spent explaining the structure and content of the questions to the children, either using the questionnaire sheet or by displaying the information on a screen from an overhead projector (**Figure 2.6**). Any problems or queries about questions were answered by the questionnaire administrator. With one or two exceptions, the class teachers were not present when the questionnaire was administered enabling the children to feel that they could answer the questions frankly, especially those on personal smoking habits. Most questionnaires were checked by the fieldwork personnel before completion of the fieldwork in each school and any problems or missing answers were followed up with additional questions to the child.

Across all four years of the study a few people only were involved in the administration of the CQs to all the schools and classes concerned and all were trained by the same person.

Coding

On completion of the fieldwork each year, the three sets of data for each child i.e. PQ, CQ, histamine form, and health check form where relevant, were matched. All questionnaires were scrutinised and a number of the answers in both the PQs and CQs were coded. An individual identification number was allocated to each child, based upon district, school, primary level, class number and position on the class register, and this was added to each questionnaire. In addition, for all those children who were followed for more than one year, the previous year(s) identification numbers were added to the current questionnaire after identification was established.

Checking

Over the four years of the study a number of strategies were adopted to ensure completeness and quality of the data, including individual manual checking of the scripts, software based checks, and specific computation routines. In 1989, each questionnaire and clinical assessment form was individually scrutinised before the data were coded. In 1991, every tenth set of questionnaires was checked for coding errors and additional checks were run on five scripts either side of any incorrectly coded questionnaires. If no further errors were found, checking then reverted to one in every ten scripts. But if further errors were found, every script was checked until ten sequential scripts were found to be error free (Military check). In 1990 and 1992, manual checking before data entry was replaced with checking after data entry.

Data entry

In 1989 and 1990, data were keyed into a nondocument file on Wordstar software and then every tenth script was checked for random keying in errors. In 1991 a DBase programme was developed for the data entry. After being keyed in, the data were **checked again**, by scrutinising the input on the computer screen for data entry errors, employing similar checking techniques to those used for the coding, i.e. the data entry for one in every tenth set of questionnaires was checked against the raw data, and additional checks run on five scripts either side of any incorrect entry.

For 1992, a Foxbase software programme was used for data entry and additional error checks incorporated into the programme. Checking of every tenth questionnaire, after data entry was also performed, as in the previous year.

Cleaning

Programmes were written to check for errors in the data input, in terms of looking for impossible, inapplicable and unlikely values. All such values were identified back to the individual questionnaire and checked for accuracy. Where answers to questions were conditional on answers to previous questions, logic routines were developed to check for consistency and possible errors. Finally, correction programmes were written and run to correct all errors found.

At the end of the normal cleaning procedures, for each year's data set, the data bases for the four years were combined into a single data base with the names of all variables standardised. Subjects were given an unique identification number. The data was then join matched across the different years to facilitate further checks for consistency and for the generation of various data sets for cohort analysis. All inconsistencies identified were checked back to the original questionnaires for confirmation and corrections made when necessary to the data set.

Overall, the data quality in terms of completeness, accuracy, and internal consistency is considered to be good.

2.6: ANALYSIS

Initial examination

For each year of data, where relevant, frequency distributions, descriptive statistics including means and standard deviations and crude prevalence ratios were calculated.

The respiratory, socioeconomic, anthropometric and demographic variables from both the parents' and the children's questionnaires were examined for differences between the two districts, using nonparametric tests such as the chi square test and parametric tests, such as a t-test or analysis of variance, as applicable.

Adjustment for covariates

For all study variables where statistically significant differences occurred between the two districts, further analyses by multivariate methods were employed to estimate the risk of respiratory problems associated with several potential independent explanatory factors.

For the analysis of this data set we employed logistic regression. In multiple linear regression the mean value of the dependent variable is expressed as a linear function of a set of explanatory variables. For an observed value of the dependent variable there would be an error term. The error terms are assumed to be independently and normally distributed with zero mean and constant variance. The concept of a relationship between the distribution of a dependent variable and a number of explanatory variables is just as valid when the dependent variable is qualitative as when it is continuous. 'For example, consider a binomial variable representing presence or absence of disease. For a homogenous group of individuals the number with the disease would be distributed according to the binomial distribution with a constant probability of having the disease. That is, there would be a relationship between the probability of disease and a set of explanatory variables. This relationship would not usually be linear since a straight-line relationship would imply probabilities outside the legitimate range of 0 to 1 for some values of the explanatory variables. In order to fit the relationship into the framework of linear regression it is necessary to apply a transformation and this leads to the method of logistic regression[45].

The initial aim of this study was to provide baseline data, by identifying the most important risk factors for respiratory health problems in children and their parents, by isolating these risk factors from other potential causative factors. To do this, comparison was made between groups who have or have not been exposed to the risk factor of special interest, e.g. air pollution, smoking in the home. A measure of the increased risk (of a bad health effect) in the exposed group, compared with that in the non-exposed group, was then calculated. The measure which is usually employed is the ratio of the incidence of the bad health effect in the groups which are being compared. This ratio is called the relative risk. But, unless a full history of occurrence of a bad health effect and exposure is obtained through a prospective follow-up study of the subjects being studied, the true incidence of the relevant risk effect is not known. Therefore a mathematical approximation to the relative risk, the odds ratio is employed. The odds in one group compared to the reference group can be considered as the ratio of the odds in favour of having the bad health effect.

The basic analysis can be represented by a simple 2 x 2 table:

	Health Problem (respiratory symptom) Disease present	Disease absent	
Group exposed to a factor	p1	p2	p1 + p2
Not exposed (reference)	p3	p4	p3 + p4
	p1 + p2	p3 + p4	

where p1, p2, p3 and p4 are the proportions of the population who fall into the categories:-

p1	Exposed/Disease present	p2	Exposed/Disease absent
p3	Not Exposed/Disease present	p4	Not Exposed/Disease absent

The expression $\dfrac{p1 \cdot p4}{p2 \cdot p3}$ is the odds ratio;

i.e. the ratio of the odds of having the disease when exposed, to the odds of having the disease when not exposed.

The odds of having respiratory disease, for example, because of residence in Kwai Tsing compared with Southern District, calculated by the above method, is an unadjusted estimate which may be biased because of some other differences between the populations in the two districts, such as socioeconomic status, educational attainment, smoking, and use of specific cooking fuels. Logistic regression analysis was used to adjust for the effects of co-existing but potentially independent risk (or confounding) factors by including the covariates together with the main risk factor in the same model. Only the main effects of the factors are included, as interaction and higher order terms were found not to be significant in the baseline data in preliminary analysis.

Modelling for composite respiratory symptom scores

It would be expected that some reported symptoms may be highly correlated, and hence analysing them individually may lead to replication in the conclusions. A method is required to summarize the twelve respiratory symptoms into a smaller number of independent factor scores to reflect how likely one is to have a certain underlying problem. Factor analysis was employed for this purpose. To each factor, weights are given to each symptom (recoded as 0 for absent, 1 for present) to reflect their contribution to the score and how correlated they are to each other in the factor. After some transformation (rotation) the weighting will become clear-cut with the highest coefficients given to the most important and highly correlated symptoms and the lowest coefficients to those less important symptoms. A relatively smaller number of factors is obtained with a calculated proportion of variation being explained in this way.

Further, groups of highly correlated symptoms identified by the factor analysis are used in defining another indicator variable, that is, whether or not a subject has any of the symptoms from each of the symptom groups. Similar statistical analysis methods are employed as in the other respiratory health models, but this time using the composite scores of factors as dependent variables.

Adjustment for time dependency

Data sets for each of the four years of the study were combined and matched by the identification numbers of the children. The new data set was then reorganised to form different cohorts of children, each of which was analyzed using an extension of the above statistical modelling techniques, to determine

(a) time effects with respect to respiratory symptoms and histamine challenge responses,

(b) to address the question raised by the aims of the study outlined above, i.e. whether the 1990 low sulphur fuel legislation and the subsequent immediate fall in sulphur dioxide levels and, to a lesser extent, those of particulates, have had any impact on respiratory health.

The modelling techniques are developed from generalised linear modelling, including logistic regression for binary data and multiple regression for continuous data. This technique incorporates a procedure which takes account of time dependence for the same subject, i.e. the within-subject correlation between measurement occasions, in each cohort. The procedure is called *generalised* *estimating equations (GEE)* which can be regarded as an extension of the generalised linear modelling procedure.

Outcome measures

Three important outcome measures are determined in the analysis, a district effect, an occasion effect and an environmental tobacco smoke effect.

1. The **district effect** is a measure of excess risk of experiencing respiratory ill health attached to living in Kwai Tsing when Southern District is taken as reference.
2. The **occasion effect** is the change observed in risk estimated from data collected from measurement sessions which took place over the four years of the study. Because of the time sequence, the occasion effect, as estimated in this analysis, can be regarded as an **intervention effect**, when the occasion straddles June 1990 and the implementation of the sulphur fuel regulations.
3. The **environmental tobacco smoke effect** is a measure of the excess risk of living in a home where family members smoke with non smoking families taken as reference.

Adjustment for the clustering effect

As the sample is based on students in schools, this may lead to a so-called design effect, or correspondingly, a cluster effect, which affects the independence between subjects. Because of this, standard statistical modelling techniques cannot be used. The effects due to the clustering of students in classes, a subdivision of children in schools, are examined using the GEE approach.

Data handling of original and additional schools subjects

All crude prevalence data have been calculated from the total data set from all fifteen schools, but for the modelling analysis; respiratory symptom and factor models, where cohorts of children are followed across a number of years, the data set comprised children from the original ten schools only.

3

THE DATA SET

3. DATA SET

3-1: DEMOGRAPHICS

Table 3.1.1 records the number of children on the school register for each of the four years of the study, the number of absences and the final number of children who participated in the study and completed questionnaires. There were no refusals and the only missing data sets are from children absent on the day on which their class completed the fieldwork.

Table 3.1.2 provides a summary of the number of schools visited, primary grades covered, and the number of children who completed questionnaires, across all four years of the study. It also includes the number of children who took part in the histamine challenge test in the last three years of the study.

Table 3.1.3 indicates the percentage fraction sampled of the total district population[46] of that age and gender for each of the four years of the study. **Table 3.1.4** provides the breakdown of the final data set of child responders by their district of residence, school attended, and primary grade, over the four years of the study. **Table 3.1.5** is similar but gives the subject numbers by gender and primary grade in each district. Finally, **Table 3.1.6** gives the subject numbers by year of age, as well as by gender and district of residence.

Overall the tables demostrate that the numbers in the data sets in the two districts are very similar.

3.2: MISSING SUBJECTS

Children's questionnaires

Table **3.2.1** provides the number of absences on the day of the fieldwork by school and by primary grade, for each of the four years of the study. Once again, there are few differences between districts, or between primary grades, and only small differences between schools.

Parents' questionnaires

In 1989, the final data set for the PQs comprised 96.6% of the total sample population and the percentage returned in the other three years, 1990, 1991 and 1992 was 94.0%, 95.7%, and 95.5% respectively. There is little variation between districts in the percentage returns for the four years, 1989, 1990, 1991 and 1992, with 96.9%, 95.7%, 95.4% and 93.4% in Southern District and 96.0%, 94.5%, 96.0% and 97.9% in Kwai Tsing.

3.3: MISSING MEASUREMENT DATA

Children's questionnaire

In spite of considerable effort, both in the classroom during the completion of the questionnaire and afterwards during the checking of the questionnaires, there were inevitably some children who omitted to answer one or more questions. **Table 3.3.1** presents the percentage of missing answers for each variable on the CQ, by district. For all variables, the highest percentage of missing answers for any one question is 1.7% in 1989, 1.3% in 1990, and 1.2% in both 1991 and 1992.

As might be expected, there are differences in the response ratio at different ages and in the different primary grades. **Table 3.3.2** gives the percentage of missing answers in the CQ by age and by primary grade. Generally the response level improves with increasing age or primary grade, with the exception of the oldest age group. The children in this group, who can be found distributed throughout all the primary grades are backward in terms of their current educational achievement, for many and varied reasons, and therefore, although overage, they are still pupils in junior school.

Parents' questionnaire

Table 3.3.3 is similar to Table 3.3.1 but provides information on the completion rate of the PQ by district for the four years of the study. Compared with the children's questionnaires, these were less complete, with missing responses, ranging from 2.2% to 27.6% (1989) 1.2% to 26.3% (1990), 1.5% to 23.3% (1991) and 0.4% to 20.0% (1992). There were no differences between the two districts in terms of missing data.

Adjustment for missing data in the children's and parents' questionnaires

In the case of missing data in a PQ in any one year, where such answers should not change over the period of the study, e.g. educational attainment of parents, the response from the other years' questionnaires was studied. If a consistent response was found, this answer was used to replace the missing data item.

For other variables, e.g. respiratory problems and smoking, where the same question was asked in both the PQ and CQ, in cases where the CQ answer was missing, the PQ answer was substituted, if it was available.

The remaining missing data, which comprised a very small proportion of the total data set, were included in the reference group in all the statistical models.

In summary, the data collection in the four years of the study covered approximately 60,000 questionnaires from children and their parents, with an average of 75 questions on each, plus 15,000 histamine challenge tests. It was, on average, over 90% complete, with no differences between the districts and few differences between primary grade or age of the child.

3.4: VALIDITY AND COMPARABILITY

Timing of survey

Table 3.4.1 states the month in which the fieldwork was performed in each school. A deliberate attempt was made over the four years of the study, to carry out all fieldwork within a period of the same four months, although there is some variation, partly due to the timing of the school Easter break each year.

Completion of the parent's questionnaire

Table 3.4.2 presents the information on the completion of the parent's questionnaire. Across the four years of the study, and by district within each year, the answers are similar, with the child's mother or father completing the questionnaire, in the majority of cases.

Differences between the initial and additional schools

Tests were carried out to check for any differences in absence rates and questionnaire responses between the additional schools added to the study in 1991 and those in the original study group. A comparison of missing information between the original and additional schools in 1991 shows that the response rates were very similar for all variables (**Table 3.4.3**).

To determine if there were any differences in demographic, socioeconomic, respiratory and smoking status between the original and additional schools, but to avoid a biased comparison of P3 and P4 children only in the additional schools with P3 to P6 children in the original schools, **Table 3.4.4** presents the answers from the P3 children and their parents only. **Table 3.4.5** provides similar information for parental educational attainment. For living quarter size there are some differences between the two groups ($t=2.98$, $df=2106$, $p=0.003$), with the original school families having larger quarters, mean size 400.8 sqft, compared with 367.1 sqft.

There are no differences in age between children attending the original schools and those in the additionally recruited schools ($t=1.04$, $df=2920$, $p=2.99$). The mean age for children in the original schools was 9.02 years and in the additional school, 9.00 years. This very slight difference is probably due to timing of the fieldwork in each school.

In conclusion, there are few differences between the original and additional schools and these are probably attributable to the geographical position of the school. Although the additional schools were chosen by the criterion that they were close to schools already participating in the study, in some instances they may serve a different catchment area. This has resulted in the slight differences in the housing type seen, with public housing being more strongly represented in the additional school group. This in turn contributes to the differences found in living quarter size and both may be accounted for by the slightly lower level of educational attainment seen in the parents from the additional schools.

The slight change in proportions of boys and girls between the two groups is attributable to the fact that one of the additional schools recruited was an all girls school only. This may also explain why there are fewer child smokers in the additional schools.

Finally, with respect to respiratory symptoms, differences only occur between the P3 children in the original and additional schools for *morning cough*, *nasal symptoms* and *doctor diagnosed asthma* and *allergic rhinitis*, with the additional schools having a higher prevalence in all cases except for asthma.

The study data set show a high level of completeness:

* Non-response rate: < 5% for parents
  < 2% for children
* Missing data: < 4% for children
  < 10% for parents
* Comparability between original and additional schools is good

4

SOCIOECONOMIC FACTORS

4. SOCIOECONOMIC FACTORS

Because of the size of the sample and the resultant power of the study, even very small fluctuations of a few percent from year to year may show as highly statistically significant values when comparing data across the four years of the study. In addition, the follow-up study contains data from an additional set of schools as well as the original ones. In some instances there are some slight differences between the original and additional schools, (see section 3.4), even though they are geographically sited close to each other, and this contributes to the observed variation between the first two and last two years of the study.

4.1: LIVING WITH PARENTS

Consideration of and adjustment for the socioeconomic factors as covariates is only valid if the child actually lives with his/her parents. **Table 4.1.1** shows the proportion of children living with their parents, by district, for each of the four years of the study. There are no differences between the districts and over 93% of all children live in the parental home.

4.2: EDUCATION OF PARENTS

Table 4.2.1 gives the education level achieved by the mother and father in the two districts, over the four years of the study. As can be seen there are some differences between the original study and the follow-up study. This may be due to parental information from the additional schools included in the follow-up study. There are statistically significant differences between the districts, with fewer Kwai Tsing parents continuing in education through to higher secondary and tertiary level.

One interesting point is that in the follow-up study, in the category of no formal education, the proportion of Southern parents is approximately double that in Kwai Tsing. This may be because some of the parents from one of the new schools recruited to the study in 1991 are members of the Tanka boat people recently rehoused in the Aberdeen area.

4.3: OCCUPATION OF PARENTS

Table 4.3.1 presents the number and percentage of parents in work. There are some differences between districts for the fathers, with fewer Kwai Tsing fathers currently employed, but no differences for the mothers.

Table 4.3.2 provides a breakdown of occupation of the parents by district. This question was only included in the follow-up study. There are differences between the two districts for both mothers and fathers, with more parents in Kwai Tsing working in manufacturing industries and fewer employed in professional or clerical jobs.

4.4: HOUSING

The housing profile across the four years of the study is very similar but there are differences between the two districts as shown in **Table 4.4.1.** More families in Kwai Tsing living in public housing and fewer in private accommodation. The numbers living in temporary or other types of housing are low and similar in both districts.

Table 4.4.2 presents the mean size of the living quarters, the average number of people per household, the mean area per person available in the home, and the length of time the family has lived in that home, with standard deviations and sample sizes, for the four years of the study. There are statistically significant differences between the two districts with Kwai Tsing families having smaller living quarters, a smaller area per person, and they have lived in those quarters for a longer period of time.

In Kwai Tsing,

- **parents have lower educational attainment**
- **fewer fathers are currently employed**
- **more parents work in manufacturing jobs**
- **fewer parents work in clerical jobs**
- **more families live in public housing**

compared with Southern District families

4.5: INDOOR AIR QUALITY

Cooking and heating fuels

Table 4.5.1 shows the type of fuel used for cooking and heating in the two districts. There have been some changes over the four years of the study, with less kerosene and liquid petroleum gas (LP gas) being used in the latter years compared with the baseline study. This change may be influenced by the contribution of the additional schools in the follow-up study. In addition to the trend towards greater use of town gas, there are still some differences between the two districts in the use of all types of fuel for cooking, with the exception of firewood, with Kwai Tsing households still using more town gas and more kerosene compared to Southern District.

Use of incense and mosquito coils in the home

Finally, air quality within the home is affected by the burning of mosquito coils and incense. There are some differences between districts for the use of mosquito coils with Kwai Tsing residents using less, but no difference in the use of incense between the districts (**Table 4.5.2**).

Kwai Tsing families

*** cook mostly with town gas or kerosene**
*** burn more mosquito coils**

compared with Southern District families

4.6: SUBJECTIVE ASSESSMENT OF AIR QUALITY

Both the parents and the children were asked on their questionnaires whether they considered the air quality good or bad, in various locations including the home and the school. The Kwai Tsing and Southern children's and parents' opinions on the air quality in the home is shown in **Figure 4.1** and their opinion of the air quality in the child's school is shown in **Figure 4.2**. The general impression is that the air quality is perceived to have not shown any improvement over the 4 years of the study, although there was a short temporary upturn in 1991, and it may even have deteriorated in some instances.

Table 4.6.1 presents the number and percentage of parents and children who consider the air quality as good. There are significant differences of opinion between the districts for both parents and children on the quality of the air in all venues listed in the questionnaire, with the Kwai Tsing children and their parents being less satisfied in every case.

Kwai Tsing children and their parents

*** consider that their air quality is not good**

compared with Southern District families

5

SMOKING IN THE FAMILY HOME

5. SMOKING IN THE FAMILY HOME

5.1: PARENTS AND OTHERS

From the children's questionnaire information was obtained on whether the parents, siblings who lived at home, and other family members who lived in the family home, were smokers or not. **Tables 5.1.1 to 5.1.3** present this information by district and by year of the study. In addition, family smoking status was categorised by combining the responses of the parental, sibling and other family members smoking status and recoding this result into three categories:

no smoking members; one member of the household who smokes; two or more family members who smoke.

Very few mothers smoke but there are some differences between numbers in each district, with a higher proportion of Southern mothers as current smokers. For the fathers, 30% or more are current smokers in Southern and as many as 42% in Kwai Tsing. Siblings show a similar pattern to that of fathers, with more sibling smokers in Kwai Tsing families. There appears to be no consistent trend in the smoking numbers over the four years of the study. For others living in the family home who smoke, the numbers in each district are very similar, with fluctuations over the years in both districts. Overall, the child is exposed to environmental tobacco smoke from one or more smokers in the home, in 44% of households in Southern District and 50% in Kwai Tsing.

Kwai Tsing children are more likely to

*** be exposed to environmental tobacco smoke**

compared with Southern District children

5.2: THE CHILD

Children were asked about their smoking practice and coded as never smokers (if they had never smoked) and ever smokers (if their experience of smoking ranged from having tried a few puffs, used to smoke, through to smoking more than 6 cigarettes a week). **Table 5.1.3** presents the children's smoking behaviour by district and by survey year.

Overall, approximately 11% of all children had experimented with smoking, but ever-smoking ranged from 5% of the eight year olds to 40% of the thirteen year olds measured. There are some differences between districts and some fluctuations over the four years of the study, but no obvious trend.

Kwai Tsing children are more likely to

*** have tried smoking themselves**

compared with Southern District children

6

RESPIRATORY SYMPTOMS

6. RESPIRATORY SYMPTOMS

6.1: CRUDE PREVALENCE

Twelve respiratory symptoms were included in the analysis:

Subjective complaints

1) morning cough, 2) evening cough, 3) cough for three months,

4) morning phlegm, 5) phlegm day or night, 6) phlegm for three months,

7) sore throat, 8) nasal symptoms, 9) wheeze,

Doctor-diagnosed conditions

10) asthma, 11) allergic rhinitis, 12) sinusitis.

Doctor consultation for cough, phlegm and wheeze

Preliminary analysis of the variables; *doctor consultation for cough, phlegm* and *wheeze* found increased visits associated with exposure to environmental tobacco smoke, but no clear correlation with district of residence. Further analysis to quantify the impact of the intervention and the utilization of health services will be carried out, but is not included in this report.

Mean prevalence by primary grade

For the initial analysis of these twelve respiratory symptoms, **Tables 6.1.2 to 6.1.13** present the mean prevalence of each of the symptoms by school and primary grade for each of the four years of the study. Sample sizes for all twelve tables are given in **Table 6.1.1**. The decreasing mean prevalence with increasing primary grade, for most of the symptoms reflects the well established fact that the youngest children are at highest risk and their vulnerability and the prevalence of respiratory symptoms decreases with increasing age. The exceptions to this are the *doctor diagnosed conditions of asthma*, *allergic rhinitis* and *sinusitis*, which show similar or slight increased prevalence from P3 to P6.

Mean prevalence by primary grade and by gender

Tables 6.1.15 to 6.1.19 give the mean prevalence of each symptom by gender and by primary grade for the two districts, over the four years of the study. Sample sizes for these tables are given in **Table 6.1.14**. The trend of decreasing prevalence in most respiratory symptoms with increasing primary grade can be seen in both boys and girls. But, in addition, in all cases, the prevalence is lower, overall, in the girls compared with the boys. Once again, the prevalence of *doctor diagnosed symptoms* shows little decline in either sex, with increasing age.

6.2: RESPIRATORY SYMPTOMS AND SOCIOECONOMIC STATUS

From the selection of social and demographic variables available in the parent's questionnaire, father's education was chosen as a proxy for socioeconomic status. The option of using educational attainment of both parents was excluded because they are highly correlated. Occupational status was also excluded as over 92% of the study population fathers are in work, as are 37% or more of the mothers. Housing type was also considered but there are basically only two choices in Hong Kong and the majority of the population studied live in public housing. Housing size, another variable, had a poor response rate relative to the other variables and, again, is correlated with type of housing. **Tables 6.2.1 to 6.2.6** present the mean prevalence of the twelve respiratory symptoms by father's attained educational level and by district, for the four years of the study. Sample sizes are as given in Table 6.1.1. For the *doctor diagnosed symptoms* and *wheeze* there is a positive correlation between increased prevalence and higher educational attainment, but the pattern is less clear for all *cough* and *phlegm*, *sore throat* and *nasal symptoms*.

6.3: RESPIRATORY SYMPTOMS AND DOMESTIC FUEL

Tables 6.3.2 to 6.3.6 present the prevalence of each symptom with respect to the fuel used in the home for cooking and heating. However, heating is used for such a short period each year in Hong Kong that any pollutants produced by fuel used for this purpose are likely to have small impact, if any, upon respiratory health. There appears to be very little difference in symptom prevalence between the different types of fuel used. Sample sizes for this set of results are given in **Table 6.3.1.**

6.4: RESPIRATORY SYMPTOMS AND FAMILY SMOKING STATUS

In view of the link between respiratory symptoms in children and passive smoking[35], the children's respiratory symptoms were examined in relation to whether they live in smoking or non-smoking families. Family smoking status was classified as non-smoking, having one person living in the family home who smokes, or having two or more people living in the family home who smoke. **Tables 6.4.2 to 6.4.6** present the mean prevalence ratios for the twelve respiratory symptoms by family smoking status and by district, for each of the four years of the study. The sample sizes for these twelve tables are given in **Table 6.4.1**. There is an obvious trend with an increased prevalence of symptoms for *all cough* and *all phlegm symptoms*, *nasal symptoms* and *sore throat* in children living in a home where one or more family members smoke. The same trend is not present for *wheeze*, and *doctor diagnosed asthma*, *allergic rhinitis* and *sinusitis*. For these symptoms, overall, the symptom prevalence is slightly lower in smoking families compared with non-smoking families. It is known that some parents opt to give up smoking after their child has been diagnosed as asthmatic, for example, and the crude prevalence figures shown in **Table 6.4.6** may reflect this.

6.5: CRUDE SYMPTOM PREVALENCE RATIOS BY DISTRICT

Tables 6.5.1 to 6.5.5 present the crude prevalence ratios for the twelve respiratory symptoms by district for the four years of the study. For all symptoms except the doctor diagnosed ones, Kwai Tsing has a higher prevalence than Southern District. Sample sizes are as given in **Table 6.1.1**.

6.6: STANDARDISED SYMPTOM RATIOS

The standardised symptom ratio is the ratio of the actual mean value to the predicted mean value which has previously been obtained by means of logistic regression. To obtain the standardized symptom ratios, the logistic regression model was used with the following independent variables:

age,

gender,

school session (morning, all day or afternoon),

housing type (public or other),

father's educational attainment, (no formal education, primary, secondary or post secondary)

smoking status of the family (no smokers, one or two smokers)

and each respiratory symptom, in turn, as the dependent variable.

Tables 6.6.1 to 6.6.12 give the actual mean and predicted mean values for each symptom with 95% confidence intervals. From the information listed under each table, it can be seen that, in general, housing type is not a significant factor, but that all other variables make a significant contribution to the model.

In conclusion, the factors identified which have a measurable influence on respiratory symptoms include age, gender, father's educational attainment, and smoking in the family home.

Children's respiratory symptoms

*** are higher in the youngest children**
*** are higher in boys than girls**
*** are higher in homes where family members smoke**
*** are higher in Kwai Tsing**
*** decrease with increasing primary grade**
*** vary between schools**
*** are positively related to parental educational attainment**

7

MODELLING FOR VARIATIONS IN RESPIRATORY SYMPTOM PREVALENCE

7. MODELLING FOR VARIATIONS IN SYMPTOM PREVALENCE

7.1: PROSPECTIVE MODELS

In order to determine whether there have been changes in respiratory morbidity over the four years of the study, the calculation of crude prevalence ratios, even after adjustment for demographic, socioeconomic and other potential causal factors, such as smoking, for each year of the study is inadequate. For determination of differences over time we need to combine the four year data set into some specially defined cohorts. The following six options for grouping the data have been explored and their results are presented in this section.

In all of the following models, only data from the children of the ten original schools, recruited in the baseline year of the study have been used, to avoid changes in the precision of estimates and any variation due to differences between the original schools and those additional schools added to the study in 1991 (see **Section 3.4** and **Tables 3.4.4 and 3.4.5**).

Table 7.1.1 presents the proposed models:

> **Respiratory symptom model 1** is based on the follow-up of the P3 and P4 cohort from 1989 through to 1990 and a comparison of this with the P3 and P4 cohort in 1991, followed through to 1992. This model provides the largest number of individual subjects. It also compares respiratory health data collected before the low-sulphur fuel legislation in July 1990 with that collected after the intervention.
>
> **Respiratory symptom model 2** uses information from the P3 and P4 cohort in 1989 and follows them through 1990 as P4 and P5, and 1991 as P5 and P6. This model compares the year prior to the fuel intervention (1990) with the 1989 baseline and the year following the intervention (1991) with the same 1989 baseline.
>
> **Respiratory symptom model 3** uses the smallest number of subjects by following the P3 cohort only from 1989, through the four years of the study until 1992 when they are in P6.

The three models listed above involve a longitudinal approach; the following three models involve cross-sectional data only:

> **Respiratory symptom model 4** includes the P3 and P4 children in 1989 only and provides baseline data.
>
> **Respiratory symptom model 5** looks at P3 children in each year of the study where data are available, i.e. 1989, 1991, 1992.
>
> **Respiratory symptom model 6** is similar to respiratory symptom model 5 but uses the P4 data set in each of the four years of the study.

7.2: RESPIRATORY SYMPTOM MODEL 1

The following independent variables are included in all of the models:

district (Kwai Tsing compared with Southern),

afternoon school session (compared with the morning and whole day sessions),

the second year effect (the second year of either the baseline or the follow-up study compared with the first year for each of the cohorts), or *the examination year effect* (compared with the baseline year)

gender (boys compared with girls),

age (increasing by year),

family smoking status (number of smokers in the family home, either one or two or more, compared with none),

housing type (public compared with other),

educational level attained by father (primary level, lower secondary, upper secondary, and post secondary all compared with no formal education).

Tables 7.2.1 to 7.2.12 present the results for each respiratory symptom. The aging effects on respiratory symptoms in each year of the survey are adjusted for in the model.
Two measures can be used to assess bias in the data related to the sampling procedure and the time scale of the study.

The **scale estimate** provides the between-classes variation and since it is approximately equal to unity in most cases, there appears to be no significant excess variation.

The within-subject **correlation** for symptoms between the two years of the cohort, although increasing, from acute symptoms to the chronic symptoms, is low, overall, in most cases. This indicates that although account has been taken of the within-subject dependence, there is little effect in the adjustment procedure.

District effect

Table 7.2.13 provides a summary of the district effects for all symptoms. For the 1989/1990 cohort there were four respiratory symptoms, *cough for three months*, *sore throat*, *nasal symptoms* and *wheeze*, which were significantly different between the two districts. For these symptoms, the odds ratios and the confidence intervals were all in excess of unity and the excess risks for living in Kwai Tsing and experiencing these symptoms ranged from 14% for *nasal symptoms* to 57% for *cough for three months*. In the post intervention period, for the 1991/1992 cohort, only one symptom, *wheeze*, differed significantly in prevalence between the two districts, and for this, the excess risk for those living in Kwai Tsing was 25%.

Kwai Tsing children were more likely to have

in 1989/1990
- **cough in last threee months**
- **sore throat**
- **nasal symptoms**
- **wheeze**

in 1991/1992
- **wheeze**

compared with Southern District children

Differences between districts have reduced
- **between the first and second study period**
- **following the intervention**

Effect of exposure to environmental tobacco smoke

Although the district effect declines over the period of the study, the smoking effect does not and exposure to the risk of passive smoking has the greatest impact in both periods. **Table 7.2.14** provides a summary of the results for all respiratory symptoms by family smoking status. In the period 1989 to 1990, there are excess risks of the child experiencing symptoms, from *evening cough* (24%) to *phlegm for three months* (59%) if they live in a home where one family member smokes. If the child lives in a home where two or more family members smoke, there are excess risks, ranging from 33% to 115%, of experiencing all of the symptoms examined, with the exception of *wheeze* and the doctor diagnosed conditions of *asthma*, *allergic rhinitis* and *sinusitis*. It is known that many parents stop smoking after such a diagnosis, in an attempt to alleviate their child's condition and this may explain the lack of a passive smoking effect in these cases. A similar pattern is also seen with the second cohort in 1991 to 1992, with the prevalence for the same symptoms being significantly higher and excess risks ranging from 32% for *nasal symptoms* to 103% for *evening cough*, if the children live in smoking families. In addition, there was an excess risk for symptoms of *wheeze* in the 1991/1992 period.

Children who are exposed to environmental tobacco smoke in the family home

- **experience more respiratory symptoms**
- **have increased risk with increased exposure**

compared with chidren who are not so exposed

7.3: RESPIRATORY SYMPTOM MODEL 2

This model compares the immediate pre-intervention year and the immediate post intervention year with the baseline data from 1989. The variables in this model are similar to those used in respiratory symptom model 1 and include *district*, *afternoon school session*, *gender*, *age*, *family smoking status*, *housing type*, and *father's educational level* but the second year effect is replaced by the 1989/1990 year effect and the 1989/1991 year effect. **Tables 7.3.1 to 7.3.12** provide the results for each of the respiratory symptoms.

District effect

Table 7.3.13 summarises the district effects for all symptoms. Only two symptoms, *sore throat* and *wheeze* differ between the two districts on average over the 1989-1991 period. **Table 7.3.14** summarises the occasion effects for all respiratory symptoms. In general there was no decrease in symptom effect from 1989 to 1990, the odds ratios are close to unity and the confidence intervals span unity, with the exception of *sore throat* and *doctor diagnosed allergic rhinitis*. In the second period, 1991 compared with 1989, the odds ratios were consistently lower by 0.19 on average, compared with the period 1990/1989, for eight of the twelve symptoms. The exceptions were *nasal symptoms*, *diagnosed asthma*, and *allergic rhinitis*, which were all higher by a similar amount, 0.19 on average, and *sinusitis*, for which there was no change. Although in most cases the confidence intervals still span unity, the fall in the point estimates suggests that there has been some improvement in 1991. A bigger drop might be expected in 1991 as the children are one year older and therefore shedding their risk but the model has adjusted for the aging effect.

Finally, adjustment is made for the interaction of the year to year (occasion effect) with the district effect (**Table 7.3.15**). For the four symptoms given, in 1989 the prevalence differs significantly between Kwai Tsing and Southern Districts, but by 1991, there are no differences between the two districts.

> **For children's respiratory symptoms**
>
> *** 1990 symptom prevalence is similar to 1989**
> *** 1991 symptom prevalence is lower than 1989**
>
> **suggesting an improvement in 1991**

7.4: RESPIRATORY SYMPTOM MODEL 3

This model follows the P3 cohort through the four years of the study, and therefore has a smaller number of subjects compared with the other two models presented above. Consequently the results are not so consistent. The variables used in this model are the same as those used in the previous two, but the year effect is measured by comparison of the three years; 1990, 1991, and 1992, with 1989. **Tables 7.4.1 to 7.4.12** provide the results for the individual symptoms.

District effect

Table 7.4.13 gives a summary of the district effect on all symptoms. For the first three years of the study the odds ratios in each subsequent year are lower than in the year before (as also seen in **Table 7.3.13**) but from 1991 to 1992 an increase occurred for all symptoms with the *exception of morning cough*, *cough for three months* and *doctor diagnosed sinusitis*. It is possible that this increase in respiratory symptoms may be attributable to the weather in 1992 which was particularly wet in the first half of the year (**Appendix 4**: mean monthly rainfall during the four years of the study)(**Figures 7.1, 7.2**). Across the four year study period differences remained for three symptoms only, in this model, *evening cough, wheeze* and *doctor diagnosed asthma*.

Cohort modelling demonstrates

*** an apparent decline in the district effect**
*** the smoking effect remains unchanged**

following the intervention

7.5: RESPIRATORY SYMPTOM MODEL 4

Respiratory symptom model 4 is the baseline model as it includes data from the P3 and P4 children in 1989 only. The results for each individual symptom, after adjustment for *gender, age, smoking in the home, district of residence, type of housing* and *education of father*, are given in **Tables 7.5.1 to 7.5.12**.

The effect due to the use of cluster-sampling is estimated and adjusted for by the use of **intra-class correlations** for each symptom. Such effects were found to be small as the intra-class correlations, ranged from 0.000271 to 0.0271.

District effect

Table 7.5.13 provides evidence of a district effect in 1989, with point estimates of the odds ratios in excess of unity for ten of the twelve respiratory symptoms, although the lower 95% confidence level is lower than unity in all except four cases, *cough for three months, sore throat, nasal symptoms, wheeze*.

7.6: RESPIRATORY SYMPTOM MODELS 5 AND 6

These two models look at the data from the P3 and P4 children, respectively, in each year of the study. The results for these two models are given in **Tables 7.6.1 to 7.6.12,** for the individual respiratory symptoms and **Tables 7.6.13 and 7.6.14** for the summary of all respiratory symptoms. The adjusted prevalence ratios showed statistically significant increases from 1989 onwards in both the P3 and P4 children, for all symptoms except *morning phlegm* (P3 and P4), *phlegm day or night* (P3 and P4) and *wheeze* and *asthma* (P3). These results are supported by **respiratory symptom model 1** data which demonstrated an increase in the second study year compared to the first year in each cohort, but with greater increases in the 1991-1992 cohort compared with the 1989-1990 group. This is unlikely to be due to a learning effect in the P3 children, as for each year, they form a new group into the study. For the P4 children, with the exception of one year, all had answered the questionnaires as P3 children. However, data used in respiratory symptom models 5 and 6 are cross-sectional and the children studied from each of the four years were born in approximately sequential years in the early 1980s. During their lifetime, the different birth cohorts will have experienced different exposures to air pollutants and as air pollution during that period was increasing it is likely that the respiratory systems of the later birth cohorts may have been at higher risk at their most vulnerable period of life.

Although the adjusted symptom prevalence has increased throughout the study, the estimated gradient between districts became lower on average over the three to four years thus reducing the statistical differences between the two districts for most of the symptoms, as compared to **respiratory model 3,** suggesting that there is a strong effect from the intervention.

Modelling of the cross-sectional respiratory health data demonstrates that

- **differences between districts have diminished**
- **an intervention effect has occurred**

when comparing the same age groups of children across the four successive years of the study

8

MODELLING FOR COMPOSITE SCORES FOR RESPIRATORY HEALTH PROBLEMS

8. MODELLING FOR COMPOSITE SCORES FOR RESPIRATORY HEALTH PROBLEMS

8.1: IDENTIFICATION OF SYMPTOM GROUPS

The symptom profiles of the children were analysed to identify those symptoms or groups of symptoms which account for most of the observed variation in respiratory health problems. Factor analysis and logistic regression were used in a two stage analysis designed to weight the outcome measure - respiratory symptoms. **Table 8.1.1** gives the results of the factor analysis for each symptom with factor one explaining 25% of the variation, and 12% of the residual variation explained in **factor two**, 9.3% by **factor three** and 8.5% by **factor four**. According to the similarity shown in the weightings of specific symptoms within each of the four factors, the twelve symptoms were grouped as follows:

Group 1: *sore throat, morning cough, evening cough, cough for three months,*

Group 2: *morning phlegm, phlegm day or night, phlegm for three months,*

Group 3: *wheezing, doctor diagnosed asthma,*

Group 4: *nasal symptoms, doctor diagnosed allergic rhinitis, and sinusitis.*

8.2: FACTOR MODEL 1

This model uses the original schools 1989/1990 cohort compared with the 1991/1992 cohort and the following independent variables:

district (Kwai Tsing compared with Southern),

school session (morning compared with whole day and afternoon),

year (second compared with first in each cohort),

gender (boys compared with girls),

age,

smoking status (number of smokers in the family home; one, or two or more, compared with none),

housing (public compared with other types),

father's educational attainment (primary, lower secondary, higher secondary, or post secondary level compared with no formal education).

The estimates of having any symptoms, in each of the four symptom groups, are presented for Group 1 (**Table 8.2.1**), Group 2 (**Table 8.2.2.**), Group 3 (**Table 8.2.3**) and Group 4 (**Table 8.2.4**). **Table 8.2.5** presents the estimated log odds ratios for a child having any symptom from any of the four groups.

Table 8.2.6 provides the results for the total symptom score with the symptoms all weighted equally, according to column 1 (**Table 8.1.1**). The next four tables, **Tables 8.2.7 to 8.2.10** have symptom scores calculated using the weightings given by factors two to five respectively, drawn from **Table 8.1.1**.

The aging and gender effects are consistently significant through this set of tables. The second year effect, which is significant in a number of cases, especially for the 1991/1992 cohort, may be attributable to a learning effect from completing the questionnaire for a second time, but this would not explain the greater differences in the 1991-1992 period. An additional factor which may account for this is the weather, which in the first half of 1992 was exceptionally wet and cool (**Figure 7.1**). A similar pattern was found in the **respiratory symptom model 3** analysis.

District effect

There is a significant district effect in the baseline years 1989-1990 for all the groups of symptoms, in both the weighted and unweighted analyses, with the exception of *nasal symptoms*, *allergic rhinitis*, and *sinusitis* and *phlegm* (unweighted). But there are no district differences in the post intervention period 1991/1992.

Effect of exposure to environmental tobacco smoke

In contrast to the improvement in the district pattern, the risk of respiratory problems associated with family smoking status appears to have worsened over the period of the study. There are significant differences between children living with non-smoking and smoking families, for all the groups of symptoms including *cough*, *sore throat* and *phlegm*, whether the scores are weighted or not, in both the 1989/1990 and the 1991/1992 cohorts. The log odds ratios are higher in the second time period compared with the first. In addition, both the the weighted and unweighted symptom scores for the grouped symptoms of *wheeze and diagnosed asthma*, and *nasal symptoms*, *allergic rhinitis and sinusitis*, also show significant differences between non-smoking and smoking families in the second time period.

In the two year period following the introduction of low sulphur fuel regulations:

- *** the district effect associated with living in Kwai Tsing has disappeared**
- *** a strong association remains between exposure to ETS in the home and respiratory health problems**

compared with the pre-intervention period

8.3: FACTOR MODEL 2

This model uses data from the P3 and P4 cohort of 1989, followed as P4 and P5 in 1990, and as P5 and P6 in 1991 and the same independent variables as **factor model 1**, with the addition of a third year effect. Using the same weighting system as in **factor model 1**, results are given in **Tables 8.3.1 to 8.3.10**. Both the 1990 data and the 1991 data are compared with the baseline data of 1989. Although this cohort of children shows strong aging effects over the three years, these are adjusted for in the model.

District effect

The model shows no statistically significant district effect on average in the three years but it does demonstrate a trend with a reduction in prevalence of symptoms in 1991 after the intervention leading to a reduction in differences between districts. There are significant differences associated with changes in the occasion effects through the three years being compared, e.g. for any *cough* or *sore throat problems*, the log odds ratios show an apparent decline from 0.07 for 1989/1990 down to -0.06 for 1989/1991. A similar trend is seen for the other grouped symptoms of *any production of phlegm*, (statistically significant in the 1991 cohort), *wheezing and diagnosed asthma*, and the combination of all/any symptoms, using both weighted and unweighted symptom scores for the same group of symptoms. A similar downward trend is not demonstrated for *nasal symptoms, allergic rhinitis and sinusitis*. For these symptoms, the prevalence has increased in the second period compared with the 1989 baseline.

Effect of exposure to environmental tobacco smoke

The model shows no change in the passive smoking effect, which we would also expect to be modified by the aging factor if this was influential in the model. There are statistically significant log odds ratios for *cough and sore throat*, and *phlegm* where the child lives with one or more smokers in the family home, with higher log odds ratios for two or more smokers in the home compared with one.

The odds ratios for *asthma and wheeze* with smoker types are not significant but there is a trend with increased log odds ratios for two or more smokers compared with one smoker. For *nasal symptoms, allergic rhinitis and sinusitis* the log odds ratios are statistically significant for two or more family smokers in the home in the unweighted factor 2 model.

Smoking can therefore be regarded as the control variable. It is to be expected that children exposed to, and susceptible to, tobacco smoke are also susceptible to variations in air pollutants. Overall, the data indicate a reduction in the district effect for children over the three years studied in this model.

After the intervention

*** prevalence of respiratory symptoms has declined**
*** the district effect has declined**
*** there is no change in respiratory symptoms attributable to exposure to ETS**

compared with the pre-intervention measurements

8.4: FACTOR MODEL 3

This model includes the P3 children in 1989 followed through to P6 at the end of four years and the same independent variables as in **factor model 2** with the addition of a fourth year effect. **Tables 8.4.1 to 8.4.10** present the results for this data set, using the factor analysis weightings and symptom groupings as in **Table 8.1.1**. In this model the subject numbers are lower and therefore the power of the model is lower.

District and occasion effects

There is a district effect demonstrated over the four year study associated with adjustments in the log odds ratios but this is only significant for the symptoms of *cough and sore throat*. *Cough and sore throat* and *phlegm* show an occasion effect in which, generally, the trend is downwards with the exception of the fourth year of the study, but for the symptom groups of *wheeze and asthma*, *nasal symptoms, allergic rhinitis and sinusitis*, the mean estimates, on the whole, increase.

Effect of exposure to environmental tobacco smoke

The effect of two or more smokers in the family home on children's *cough*, *phlegm*, *nasal symptoms, allergic rhinitis and sinusitis* however, remains strong. The single smoker effect is also significant for *phlegm*, and for *cough*, but with weighted scores only.

Modelling based on weighted groups of symptoms demonstrates

*** the district effect is reduced**
*** the smoking effect is unchanged**
*** an intervention effect has occurred**

compared with pre-intervention data

9

LUNG FUNCTION AND BRONCHIAL RESPONSIVENESS

9. BRONCHIAL RESPONSIVENESS MEASURED BY HISTAMINE CHALLENGE

The lung function tests performed on the children in 1989 showed no population differences between children in Kwai Tsing and those in Southern District. Therefore, for the next three years of the survey, a histamine challenge test was employed and differences between samples of children from Kwai Tsing and Southern districts were examined from the responses to this test.

9.1: BACKGROUND

There is evidence that increased responsiveness of the trachea and bronchi can occur in reaction to various stimuli, including air pollutants[47,48], in non-asthmatic individuals. A bronchial response to histamine has been shown to be independently associated with wheeze, waking with an attack of shortness of breath, tightness in the chest on coming into contact with animals, dust or feathers, and complaint of having continuous trouble with breathing[49] and with rhinitis, chest pains and chronic cough[50].

Since there is such a strong association between bronchial hyper-reactivity and symptoms, particularly in children, measurements of bronchial reactivity in populations are useful for defining a group of children whose airways behave differently from those of the majority. Within an atopic population, the type of allergen to which the individual is sensitized, the quantity of the aeroallergen present in the environment and the degree of atopy are all factors that may interact to increase the risk of bronchial hyper-reactivity[51].

The aim of the histamine challenge test is to give graded doses of histamine, starting at a sufficiently low dose to ensure that the subject does not have a dangerously large fall in FEV_1 and that an accurate dose response curve can be plotted. The challenge is stopped either when the FEV_1 has fallen by 20%, hence producing a bronchial hyper-reactive response (BHR), or when the highest dose has been given. PD_{20} is defined as the cumulative dose of histamine causing a 20% decrease in FEV_1. BHR is considered to be *severe* if PD_{20} is less than 0.10μmol, *moderate* if 0.11-0.80 μmol, *mild* if 0.81-3.20μmol, *slight* if 3.21-7.80μmol, and *none* if more than 7.80μmol.

9.2: DATA SET

In 1990, 522 children were asked to take part in a histamine challenge test, 21% refused and the final data set consisted of test results from 423 children. In 1991, 721 children were asked to participate, 20% refused, leaving a final total of 579, and in 1992, 615 children were involved, 15% refused so the final data set comprised 524 children.

Of the children measured in 1991, 352 of them were followed through from 1990. In 1992, 161 children were followed through from 1991 and 134 had participated in both of the previous two years. Fourteen children were measured in 1990 and in 1991, but for various reasons were not measured in 1991.

Analysis

Three dependent variables were calculated (**Figure 9.1**):

regression coefficient (calculated as the line of best fit using all the dose responses),

slope (the difference between the last and first dose given),

PD_{20} (the dose of histamine given that produces a fall in FEV_1 to 80% of its initial value).

PD_{20} has been divided into four categories of response:

no response:	higher than 7.80μmol,
slight:	3.21μmol to 7.80μmol,
mild:	0.81μmol to 3.20μmol,
moderate:	0.11μmol to 0.80μmol,
severe:	lower than 0.10μmol.

The relationship between these three variables is given in **Figures 9.2 to 9.4** for the three years of the histamine study. The plots are basically similar for each of the three years although there is more scatter in 1991 and 1992 compared with 1990. This may be attributable to the wider age range of the children measured in the second and third year of the histamine measurements.
The relationship between the children's anthropometric variables; height and weight, lung function measures; FEV_1 and FVC, and age in each of the three years of the study are given in **Figures 9.5 to 9.7**. As would be expected, for all children with normal growth and development, there is reasonable agreement between height and weight and height and age and good agreement between height and the two lung function measures. To a lesser extent, because of the greater variation found in weight compared with height for a given age, there is correlation between weight and the lung function measures. As expected, the two lung function measurements, FEV_1 and FVC are highly correlated. The correlation between age and the lung function measures is not as high seen with the other variables. The results of all these measurements are similar for all three years.

9.3: CRUDE PREVALENCE OF POSITIVE RESPONSES TO HISTAMINE CHALLENGE

The BHR (PD_{20}) end point

The sample sizes for this section are given in **Table 9.3.1**. The prevalence of a PD_{20} of less than 7.80μmol is given in **Table 9.3.2** by school, primary grade and year of study and **Table 9.3.3** presents a similar result for a PD_{20} of less than 3.20μmol. PD_{20} is presented by district (**Table 9.3.4**), by district and gender (**Table 9.3.5**), and by age and district (**Table 9.3.6**), all by year of study. The proportion of children completing the full challenge and showing *no response*, increased in both in Kwai Tsing and in Southern District, over the three year period and the proportion of children responders in the categories of *slight*, *mild*, *moderate* and *severe* has declined. There were no cases of a severe response in Southern District in any of the three years of the study but three in Kwai Tsing. There are important differences between the districts, with more children in Kwai

Tsing showing a *moderate*, *mild* or *slight* response and differences by gender, with more boys having a response to the histamine challenge compared with the girls. Response to the histamine challenge test declines with increasing age and there are more non-responders to the challenge in the older children.

The PD_{20} by wheezing complaints and asthmatic status of the children is given in **Table 9.3.7**. The response pattern for the wheezing and asthmatic children differs considerably from that of the non-wheezers and non-asthmatics, as more of the wheezing children show a positive response, in varying degrees of severity, to the histamine challenge.

Based on the PD_{20} endpoint from a histamine challenge, the study demonstrates

*** a decrease in positive responses in both districts over the 3 years**
*** but a continuing higher proportion of responders in Kwai Tsing compared with Southern**
*** a higher proportion of responders are boys**
*** a reduction in response with age**
*** a greater response from asthmatic and wheezy children**

The BR slope

The mean BR slope is presented in **Table 9.3.8** by school, primary grade and by district, in **Table 9.3.9** by district and by gender, and in **Table 9.3.10** by district and by age, for each of the three histamine survey years. As with the respiratory symptom prevalence, there are differences between the districts with a higher mean slope in Kwai Tsing District, and between genders, with boys having a higher mean slope. There is also a decline in mean slope with increasing age although there is some fluctuation in the pattern over the three years.

Mean BR slope by family smoking status in each district is given in **Table 9.3.11**. The effect of passive smoking on mean BR slope measured in children living in a smoking family compared with those living in a non-smoking household appears to be mixed.

Finally, mean BR slope by asthmatic and wheezing status of the children and district is given in **Table 9.3.12**. Mean slopes are much higher in the asthmatic and wheezing children.

Based on the mean BR slope, the study demonstrates

* a decline in both districts over the 3 years of the study
* but values are still higher in Kwai Tsing compared with Southern District
* a greater mean slope in boys
* a reduction in mean slope with age
* a higher mean slope in wheezers and asthmatics

9.4: PROSPECTIVE MODELS FOR BRONCHIAL RESPONSIVENESS

Models similar to those used for the respiratory symptoms are employed to analyse the histamine responses (**Table 9.4.1**), with adjustment for a range of factors which may be associated with histamine test responses, using the following independent variables:

district (Kwai Tsing compared with Southern),

afternoon school session (compared with the morning session),

gender (boys compared with girls),

age,

family smoking status (no smokers in the family home compared with one, or two or more),

housing type (public compared with other types),

father's attained education level (no formal education compared with primary, secondary or post secondary).

9.5: HISTAMINE MODEL 1

Histamine model 1 uses information from all the P4 and P5 children measured in 1990 and provides baseline data. **Table 9.5.1** presents the results for BR slope and **Table 9.5.2** for the regression coefficient. The district effect is present, both examined by BR slope ($p=0.06$) and by using the regression coefficient ($p<0.05$). The results for BHR, recorded as *slight*, *mild*, *moderate* or *severe* are given in **Table 9.5.3** and those for BHR as *mild*, *moderate* or *severe* in **Table 9.5.4**. The district effect appears as a significant influence on BHR (**Table 9.5.4**) but not if mild cases are also included in the model (**Table 9.5.3**).

Asthmatic and wheezy children already have an altered response to histamine challenge, therefore they were excluded from the model and **Tables 9.5.5 to 9.5.8** presents the results for BR slope, regression coefficient and two levels of BHR, for all non-wheezy and non-asthmatic children only. The district effect is present at a significant level for the regression coefficient and with a BHR category of *mild* or *worse* (**Table 9.5.8**).

9.6: HISTAMINE MODEL 2

This model follows all children in the P4 cohort from 1990 through the three years of the study, until they are in P6 in 1992. The children in 1991 are compared with their results in 1990, and likewise, the children in 1992 are compared with their baseline data in 1990. The baseline data includes only measurements made before the low-sulphur fuel intervention and the two comparison years are one and two years after the intervention, respectively. This model employs the same independent variables as used in **histamine model 1**, plus an additional *year effect*. **Table 9.6.1** presents the results for BR slope and **Table 9.6.2** for the regression coefficient. The results for BHR as *slight*, *mild*, *moderate* or *severe* are given in **Table 10.6.3** and those for BHR as *mild*, *moderate* or *severe* in **Table 9.6.4**.

Although the BR slope shows a small district effect (**Table 9.6.1**), from the regression coefficient table (**Table 9.6.2**) we can see that over the three years, Kwai Tsing is still worse, in terms of this measure of bronchial responsiveness, than Southern District, although the trend in the point estimates suggests that there has been some improvement. A trend in the mean point estimates can be seen from the change between 1991 and 1990 (regression slope mean estimate 3.93) compared with the change between 1992 and 1990 (regression coefficient mean estimate 4.57). A similar trend with smaller log odds ratios is seen in 1990/1992 (-0.35) compared with 1990/1991 (-0.43)(**Table 9.6.3**). The effect of maleness on this outcome measurement, is that boys have a much higher risk of increased bronchial responsiveness.

9.7: HISTAMINE MODEL 3

This model uses the P4 cohort followed from 1990 to 1991, compared with the P4 cohort followed from 1991 to 1992. The first group, therefore straddles the intervention, whist the second group was measured post intervention. **Table 9.7.1** presents the results for BR slope and **Table 9.7.2** for the regression coefficient. Using the regression coefficient as the dependent variable, a significant district effect can be seen in this model. In addition there are significant differences in the regression coefficients for cohorts measured across the intervention period, e.g. for 1991 compared with 1990, (mean estimate = 0.04). For 1992 compared with 1991, i.e. post-intervention, there are no differences (mean estimate 0.00), suggesting that the district effect has declined. The results for BHR as *slight*, *mild*, *moderate* or *severe* are given in **Table 9.7.3** and those for BHR as *mild*, *moderate* or *severe* in **Table 9.7.4**. A district effect is demonstrated for the 1990/1991 period, but not for the 1991/1992 period (**Table 9.7.4**).

9.8: HISTAMINE MODEL 4

Histamine model 4 uses a cross-sectional approach to the data and examines all the P4 children in each of the three years of the study. **Table 9.8.1** presents the results for BR slope and **Table**

9.8.2 for the regression coefficient. The results for BHR as *slight*, *mild*, *moderate* or *severe* are given in **Table 9.8.3** and those for BHR as *mild*, *moderate* or *severe* in **Table 9.8.4**.

A district effect is illustrated in two of the four tables. A statistically significant improvement in the post intervention period of 1992 compared with 1990 is seen, but no differences between districts for 1991 compared with 1990 for BR slope and the regression coefficient. If BHR is used, as the outcome measure, (and *all dose responses* or *mild, moderate and severe* responses only) 1991 was worse than 1990, but 1992 showed an improvement on 1990 (although the results are not statistically significant).

The histamine model demonstrates

*** a district effect was present at the initial test in 1990**
*** the district effect has disappeared or declined by 1992**

compared with the pre-intervention period

10

DISCUSSION

10. DISCUSSION

10.1 CRITIQUE OF THE STUDY DESIGN AND EXECUTION

We have reason to believe that the data obtained and analysed in this study are of the highest possible standard, for the following reasons:

Methodology

Data quantity The percentage return on the parents' questionnaires was high, with refusers forming only a small proportion of the total parent data set. Although these refusers may be a group with different characteristics from the rest of the population sampled who returned their questionnaires, since they constitute such a small proportion, they are unlikely to cause any bias in the estimation of the responses. The children non-responders were only those children absent from school on the day of the questionnaire, which may have been because of respiratory illness. However, once again the numbers of non-responders in the total data set is so small that any bias to the results and their interpretation is very unlikely.

Data quality The questions used in these study questionnaires were adapted or developed from well-tested and validated internationally recognised questionnaires.

Given that most questions were of a closed style, the opportunity to produce an invalid answer was controlled and maintained as a very low proportion of total answers. Where it was found that an open ended question had produced some confusion and the response for that question was poor relative to other questions, the format was modified in subsequent years and the question reworded to become a closed question with a set of options for answers.

Collection of data Full cooperation was given by all schools participating in the study. The class-room venue for completion of questionnaires by the children was good. It encouraged a serious response by the children and the sessions were well controlled. The histamine challenge venues in the four schools involved were also adequate and data collection for that procedure proceeded with no problems.

Sampling frame The method of selection of schools into the study should have prevented or at least reduced any bias in recruitment.

The choice of P3 and P4 children was made to avoid contamination of the respiratory health data not only from occupational exposure to tobacco smoke but also from smoking practice by the children themselves. But with no data available on prevalence of smoking in Hong Kong primary school children, there was an element of risk that some children would be smokers. Eleven per cent were found to be ever-smokers although only 1% were current smokers. To determine whether these children who smoke influence the results, **respiratory model 1** was rerun

a) with the exclusion of the smoking children

b) with adjustment for smoking children, by incorporating child smoking as an additional independent variable.

The results were unchanged, implying that the small numbers of children smoking, relative to the total population studied in each model, has a negligible effect upon the results.

The selection of the additional four new schools into the study in 1991 was not random. Although it was based on previously laid down criteria for selection, this may have contributed a degree of variation to the results. To avoid this, for all the modelling techniques, data from children attending the original schools only were analysed. Furthermore an examination of the data from the original and additional schools for differences in demographic, socioeconomic, and respiratory symptom variables identified few differences.

Sample size In order to achieve a power for the study of 0.8, sample sizes were chosen accordingly. With a slight reduction in power in 1990 compared with 1989, the sampling base was increased in 1991 by the addition of four new schools.

Analytical techniques The basic analytical techniques used are well recognised standard statistical methods. The statistical modelling techniques incorporate the current state-of-the-art approach in making adjustment for potential confounding factors. In addition, the possible effects due to the use of repeated measures and clustered samples have also been adjusted for in the analysis.

10.2 INTERPRETATION

We found differences in respiratory ill-health between children living in Kwai Tsing and those living in Southern District. In order to decide whether these differences are *real* or simply *apparent*, a number of different models of data grouping and analysis were chosen. The consistency of the results, using these different approaches, suggests that the differences found are real. The prevalence of respiratory symptoms (except doctor diagnosed conditions) decreases with age as would be expected from other reports in the literature. The difference between districts declines, or disappears in some instances, post-intervention compared with the pre-intervention period. This implies that circumstances in Kwai Tsing have improved or else those in Southern District have deteriorated. The modelling of the data across the four years shows that the latter is not the case.

The questionnaire survey technique provides a very effective epidemiological method of evaluating respiratory health in a child population. Using such a method, we have

1. shown that there was a difference in respiratory health between those children living in Kwai Tsing District and those living in Southern District in 1989 and 1990 (prior to the imposition of new low sulphur fuel regulations),
2. identified the most important risk factors for respiratory ill health in children (and their parents),
3. assessed the impact of the implementation of the Air Pollution Control (Fuel Restriction) Regulations on the respiratory health of primary school children living in Kwai Tsing and found that:

a) there was a reduction in prevalence of respiratory symptoms in that district in the year immediately following the intervention compared with those prior to the intervention,

b) the differences in estimated risk between Southern District and Kwai Tsing, in terms of specific respiratory health problems, which existed prior to the intervention, have for a number of symptoms, disappeared, and for the rest a reduction in point prevalence has been demonstrated.

10.3 PREVENTABLE FRACTION

To identify the proportion of children with respiratory symptoms that can be attributed to exposure to a specific factor, such as air pollution (caused by living in Kwai Tsing) or environmental tobacco smoke, or both, the attributable risk for that population can be calculated. The population attributable risk (PAR) indicates the proportion of all cases in a total defined population that can be ascribed to a factor. This is a compound measure which reflects both the relative risk and the frequency of exposure to the factor in the population or alternatively in the diseased population.

District effect

Having demonstrated in the respiratory models developed in this report that respiratory ill health correlates with the district of residence of the children in this study, the PAR for living in Kwai Tsing has been calculated for each group of respiratory symptoms[52]. **Table 10.3.1** presents the PAR for the district effect for all subjective respiratory complaints reported in P3 and P4 children in 1989 followed through to P4 and P5 in 1990. PAR ranges from -1,6% for *phlegm day or night* to 26.9% for *cough for three months*. For any/all symptoms PAR is 6.5%. **Table 10.3.1** also presents the calculated PAR for the district effect in P3 and P4 children in 1991, followed through to P4 and P5 in 1992 (post intervention). For the same set of subjective respiratory symptoms, PAR ranges from -2.5% for *phlegm day or night* to 7.7% for *morning cough.* Although the estimates for the actual PAR may be unrealistic owing to a lack of information on exposure prevalence, the change in PAR however, is a good indicator for the presence of an intervention effect, as approximately the same proportion of exposed subjects have been involved in both the pre and post-intervention periods.

Figure 10.1 gives the PAR for any *cough, phlegm, wheeze* or *nasal symptoms* using the relative risks derived from the 1989/1990 **respiratory symptom model 1**. Using the Kwai Tsing child population of 8-11 year old children[46], the number of preventable cases in Kwai Tsing for any of the respiratory symptoms in the four groups: *any cough*, *any phlegm*, *wheeze and asthma*, *nasal symptoms and allergic rhinitis and sinusitis*, has been calculated, for a range of exposure prevalences. It has been assumed that the proportion of children exposed to air pollution is similar to that in Kwai Tsing in 1989/1990 (**Table 10.3.2**). **Table 10.3.3** gives the number of preventable cases for Hong Kong 8-11 year old child population overall, using the same assumptions. **Figure**

10.2 and 10.3 provide graphical illustrations of the number of cases preventable for Kwai Tsing and Hong Kong children aged 8-11 years, respectively. Using the 1989/90 8-11 year old Kwai Tsing children in this study as source data, the number of preventable cases has been estimated for the child population of Kwai Tsing and Hong Kong, aged 0-11 years. This is a conservative estimate as children tend to shed their risk as they grow older and these figures have been derived from the top end of this age range. **Tables 10.3.4** and **10.3.5** and **Figures 10.4** and **10.5** provide the information on the preventable fraction for Kwai Tsing and Hong Kong children aged 0-11 years of age.

Exposure to environmental tobacco smoke effect

The other important outcome from this study is the evidence that exposure to environmental tobacco smoke has a measurable effect on children's respiratory health. **Table 10.3.6** provides the PAR, for a child living in a household where *one family member smokes*, or *two or more smoke*, for each subjective respiratory symptom. PAR ranges from 1.2% for *morning cough* to 18.1% for *phlegm for three months* for living with one smoker, and 0.7% for *wheezing* to 9.8% for *phlegm for three months* if living with two or more smokers.

Table 10.3.1 shows clearly that although the PAR for living in Kwai Tsing reduced between 1989 and 1992, that attributable to exposure to passive smoking (**Table 10.3.6**) showed no reduction, and for some symptoms, there is even an increase in the risk of this exposure.

The Air Pollution Control (Fuel Restriction) Regulations of July 1990, implemented at a cost of $HK500m per annum resulted in an overall improvement in respiratory health in the most polluted areas relative to less polluted districts. Our provisional estimates of the preventable fraction are given in **Tables 10.3.4 and 10.3.5** for Kwai Tsing and Hong Kong overall, respectively, in those who screen positive for respiratory health problems. If lower levels of SO_2 and particulates are maintained in the territory, the preventable fraction of respiratory ill health attributable to these air pollutants should be lower that levels seen in the mid to late 1980s.

However, an improvement could be achieved almost immediately in up to 40% of children, and at much less cost, if all smokers gave up smoking in the family home tomorrow.

Figures 10.6 and **10.7** demonstrate graphically the effects of the low-sulphur fuel intervention. **Figure 10.6** shows the odds ratios for respiratory symptoms of children in Kwai Tsing compared with those Southern District in 1989/90 and **Figure 10.7** presents the post-intervention odds ratios for Kwai Tsing compared with Southern District. Finally, it can be seen from **Figure 10.8** that the risks to respiratory health when living with a smoking family far outweigh those of living in an area with poor ambient air quality.

11

CONCLUSIONS

11. CONCLUSIONS

The establishment of causal associations in environmental health

This Respiratory Health Study is the first population-based enquiry into the respiratory health of children in Hong Kong. The establishment of causal associations in environmental health problems is frequently a difficult task for a number of reasons. These include the low level exposures to putative risk factors and the presence of multiple socioeconomic factors. The latter render some population subgroups more vulnerable, or are non-causally associated with both the risk factor and the adverse outcome. These features may combine to make the task of identifying and quantifying risk extremely difficult. Population-based studies usually require large sample sizes, follow-up and multiple examinations of the same individuals over relatively long periods, expert management of large data bases and the application of analytical methods which take account of the confounding factors and other uncertainties.

In this study we believe that all the essential criteria for a valid enquiry have been met and that inferences about the health effects of pollution can be confidently predicted from the results of the analyses.

Funding of health research

The design of appropriate studies and their scope and efficiency depends on the resources available. The level of funding in Hong Kong is currently well below that available for other clinical and biomedical research. Overall the unit costs of these studies are much lower than those in many biomedical fields. The results of this study emphasise the need for this type of enquiry and the potential value of the intelligence both for health policy formulation and the evaluation of health interventions. In this instance the enquiry identifies the important interactions between the environmental hazards and health risk behaviour and we suggest that continuing investment is employed in similar population-based enquiries.

Targeting of resources

The quantification of two quite distinct health risks (from the external environment and within the home) point to the need for an intersectoral approach to policy formulation, implementation, monitoring and evaluation. In the case of respiratory health problems in young children the data show that the resources need for prevention require to be allocated, or re-allocated, within two discrete sectors, environmental protection and health education. In many ways this is a predictable outcome, but it does underscore the need for effective liason, common agreements on health policy between Government branches and their sectors of responsibility and continuing evaluation of the impact of policy.

Effectiveness of Air Pollution Policy

The improvement in respiratory health following the low sulphur fuel regulations is interesting because it appears to have followed a reduction mainly in SO_2 (84%) rather that particulates, which initially showed a reduction of about 23%. Previous work in this field has suggested that particulates are the most important pollutant for respiratory problems. The changes observed in this study may be accounted for solely by the change in particulates but it seems likely that the massive reduction in SO_2 has also contributed.

Overall the study demonstrates the importance of setting standards in air quality and preventing exceedence of air quality objectives. These events directly damage the health of young children, are responsible for episodes of illness and the attendant costs both to the individual and the health services.

The Respiratory Health Study clearly underlines the importance of air pollutant exceedances as detrimental influences on the health of very young children. It is however important to recognise that the excess risks measured in this study are those associated with Kwai Tsing district and with the failure to meet air quality objectives in that district. It does not necessarily mean that the air quality in the referent population is satisfactory; the risk associated with **that** environment is not measured in this study.

Prediction of future patterns of respiratory health

Future patterns of respiratory health problems in primary school children can now be predicted in terms of the two principal risk factors identified in this study. First, air pollutants and exceedences of air quality objectives show a clear relationship with the gradient in respiratory problems between the two districts studied. Second, smoking in the home by parents, siblings, other family members and lodgers is associated with an excess risk for respiratory problems which, for the exposed children, is higher than the estimates of risk for ambient air pollution.

It would be safe to assume that additional improvements in air quality would be associated with a further reduction in respiratory health problems and the resulting demand for health care. In those homes where others smoke, children would experience **additional** health gains if their exposure to environmental tobacco smoke ceased.

The identification of active smoking and associated adverse health effects in substantial proportions of these young children point to a failure of health education and tobacco control measures for this age group. Urgent remedial action is needed in this area in conjunction with environmental control of air quality.

12

RECOMMENDATIONS

12. RECOMMENDATIONS

The prevention of respiratory health problems in primary school children in Hong Kong requires

an intersectoral approach embracing:

- **air quality control**
  and prevention of exceedances of air quality objectives by SO_2, NO_x, and particulates,
- **health promotion in the home**
  and prevention of the exposure of young children to environmental tobacco smoke
- **tobacco control and effective health education for young people**
  and the prevention of active smoking by children aged 7 to 14 years.

13

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13. REFERENCES

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14

FIGURES

FIGURE 1 1: Air pollutant monthly concentration - SO_2

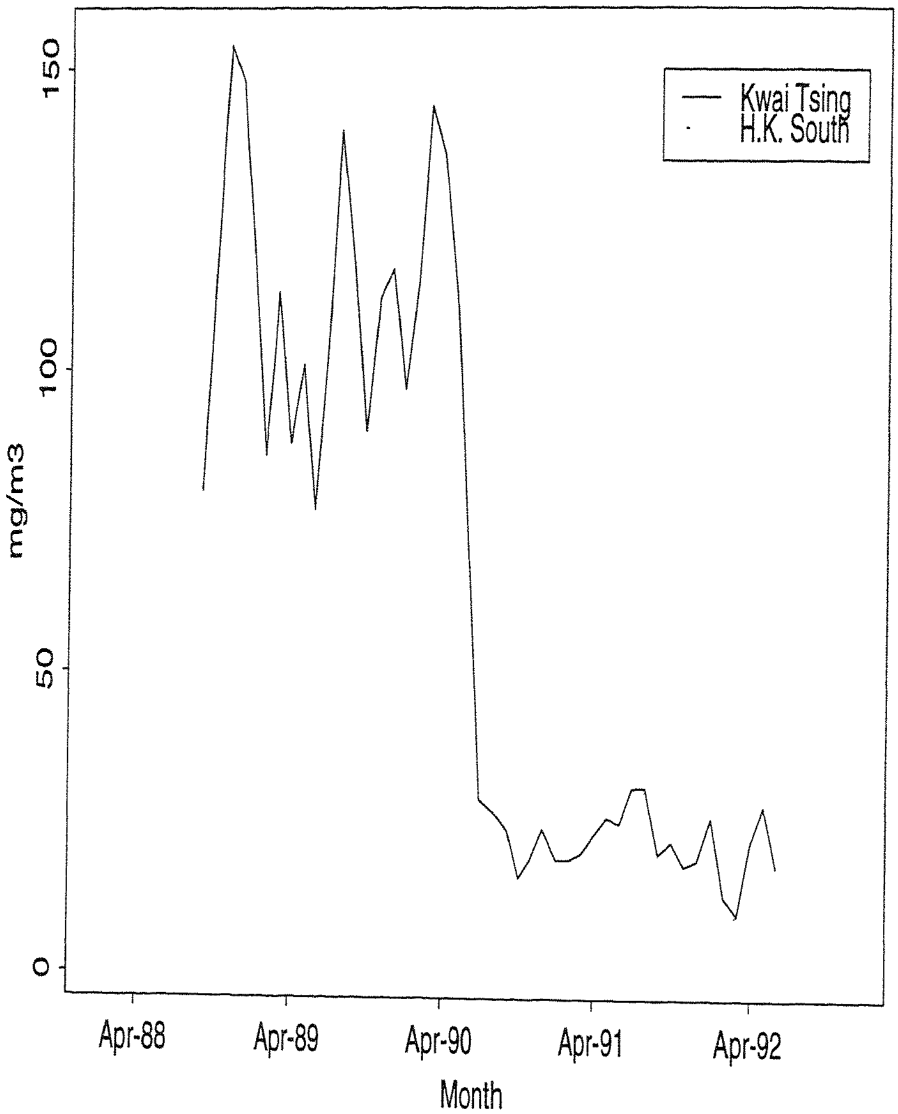


FIGURE 1 2: Aır pollutant monthly concentration - TSP

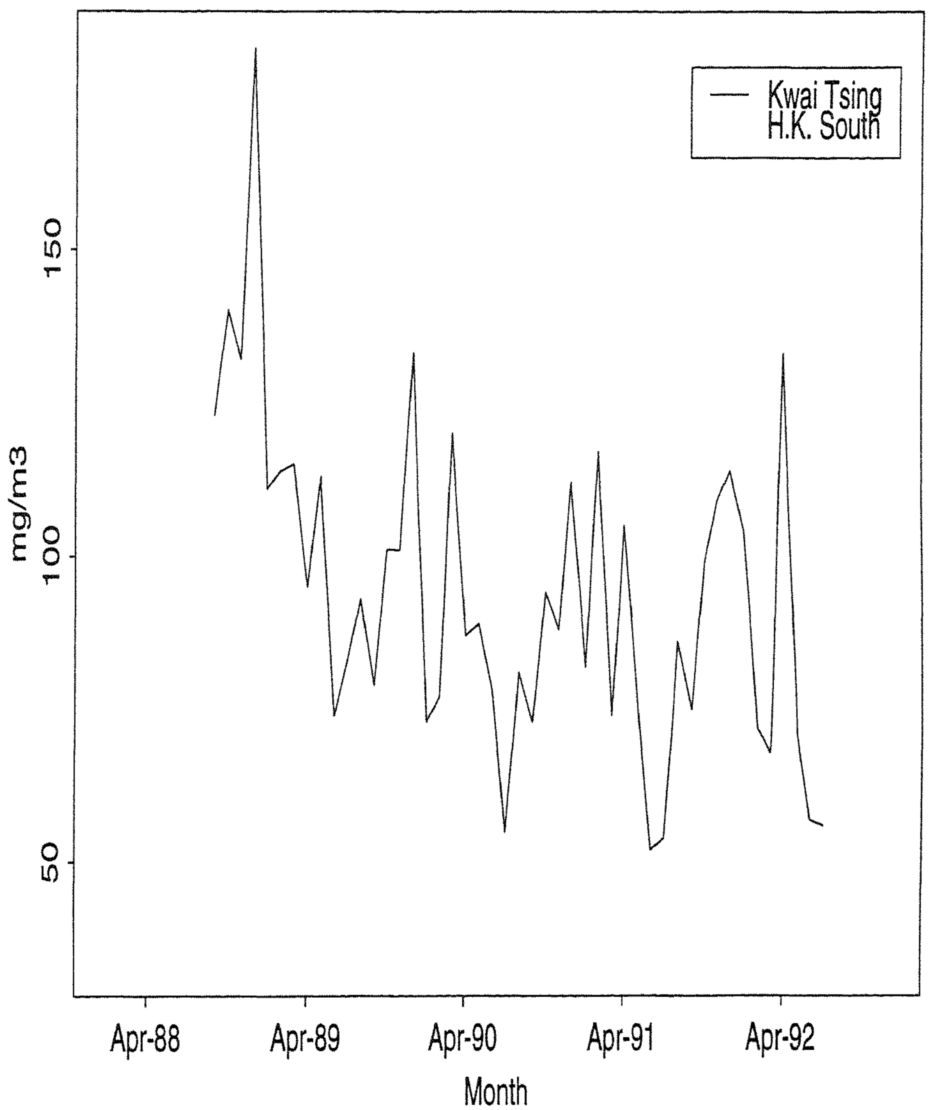


FIGURE 1.3: Air pollutant monthly concentration - *RSP*

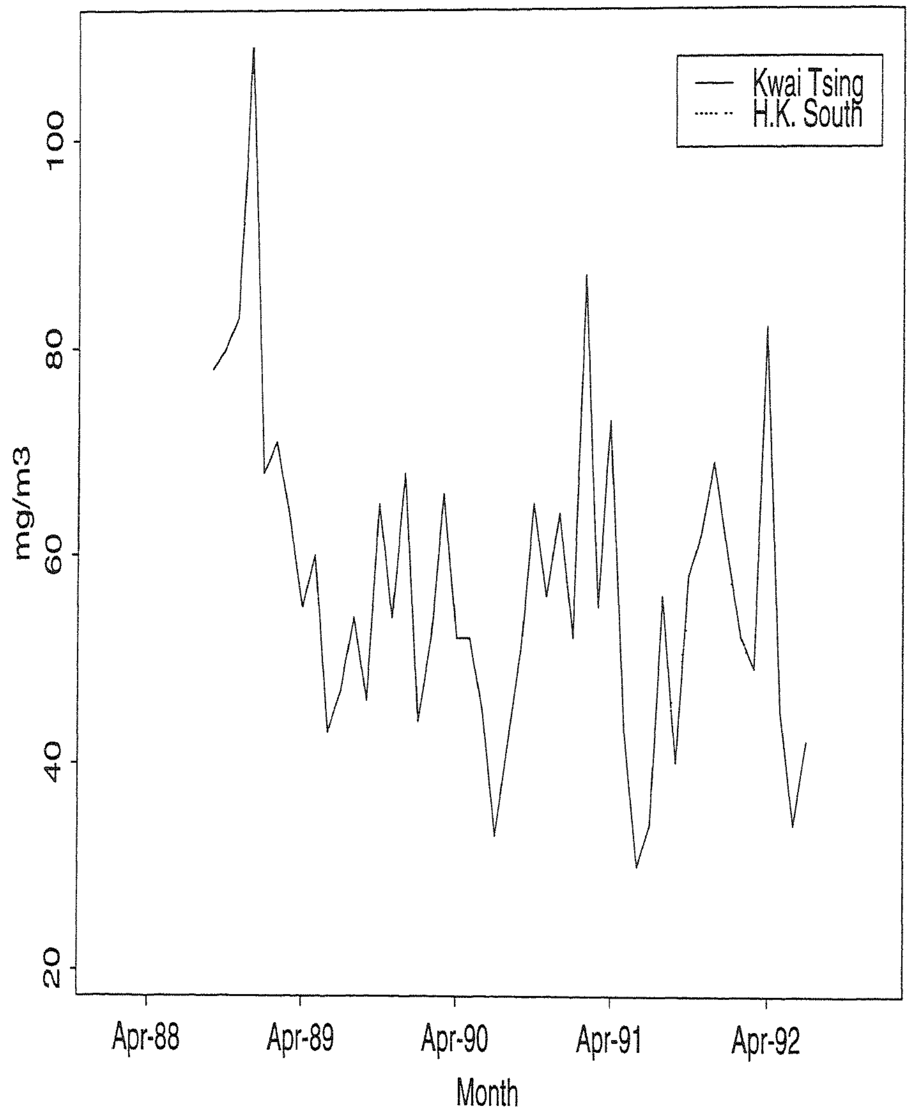


FIGURE 1.4: Air pollutant monthly concentration - NO_x

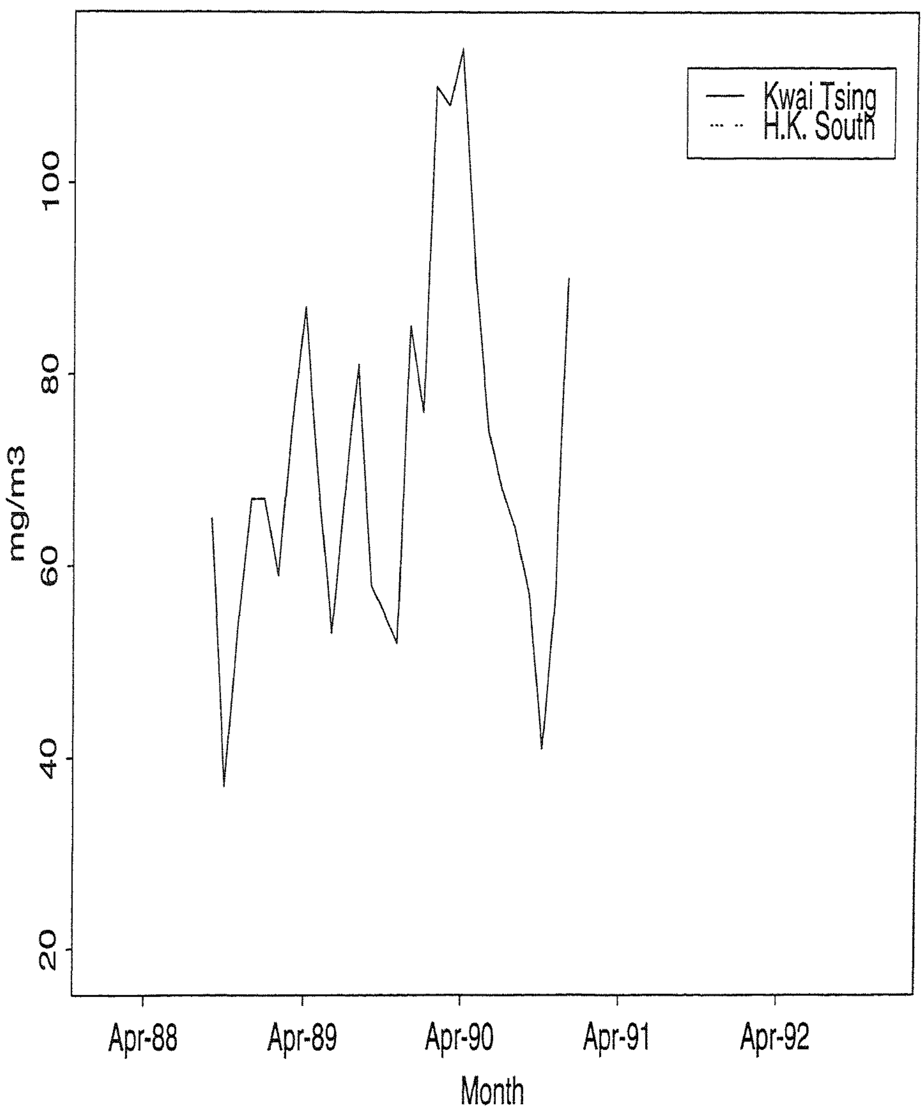


FIGURE 1 5 Air pollutant monthly concentration - NO

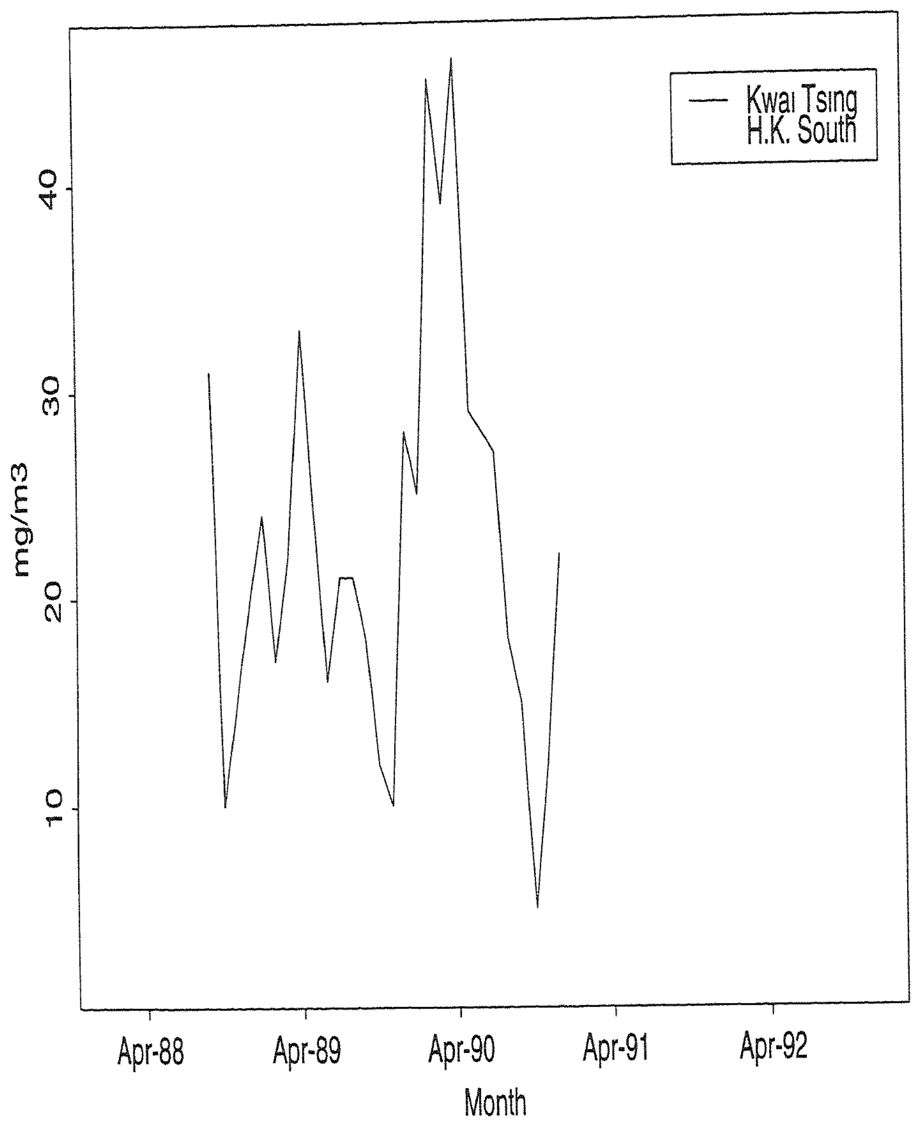


FIGURE 1.6 Air pollutant monthly concentration - NO_2

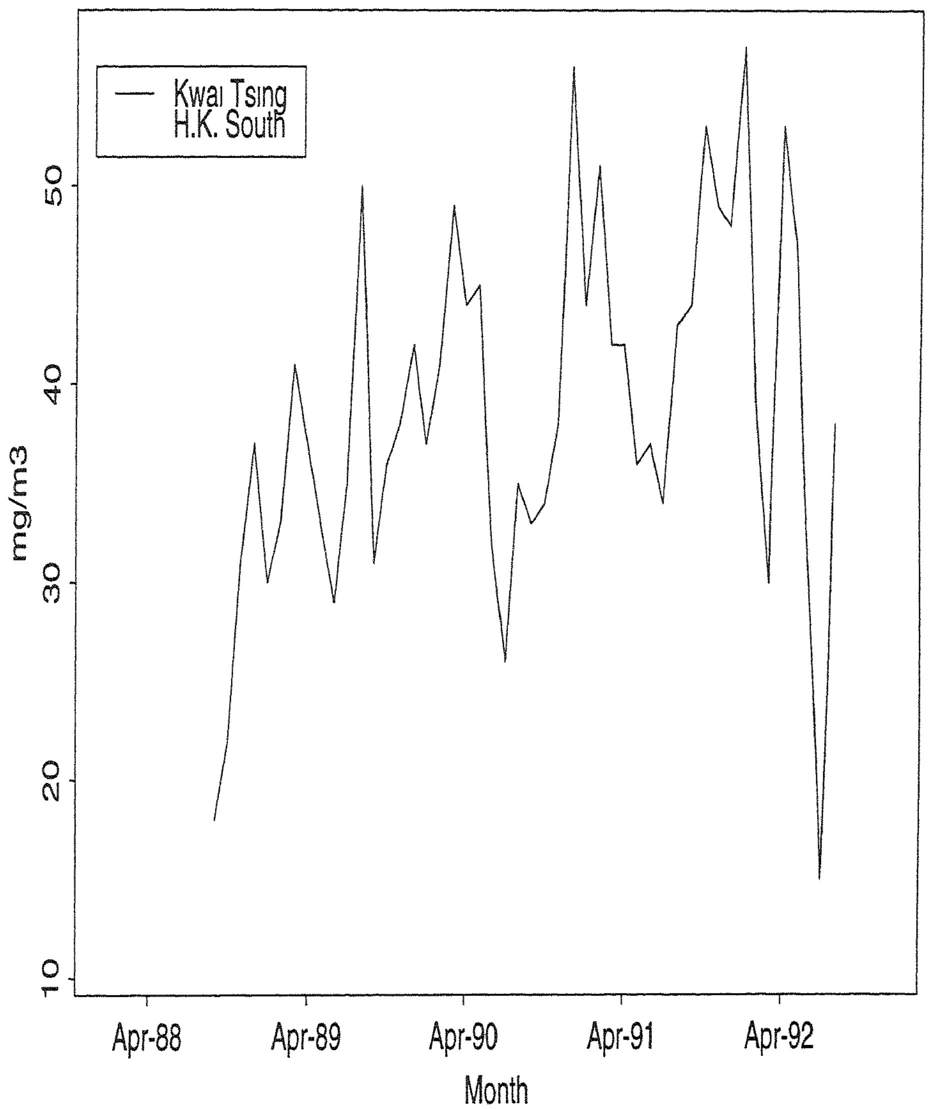


FIGURE2.1:

SOUTHERN DISTRICT

FIGURE2.2:

KWAI TSING DISTRICT

FIGURE 2.3: Waiting to have a health check

FIGURE 2.4: Measurement of height

FIGURE 2.5: Measurement of peak flow

FIGURE 2.6: Completing the questionnaire

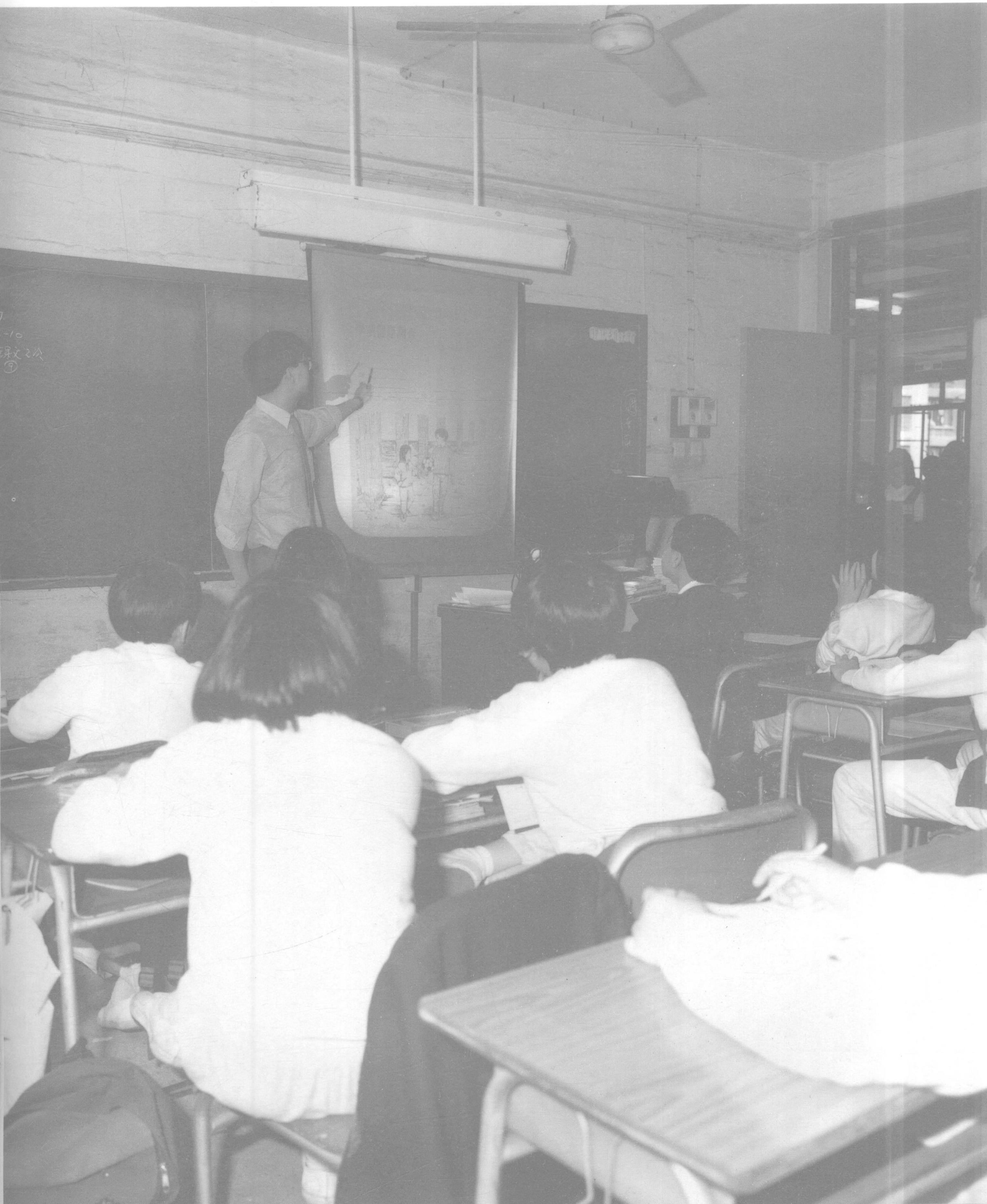


FIGURE 2.7: Using the spirometer

FIGURE 2.8: The histamine challenge

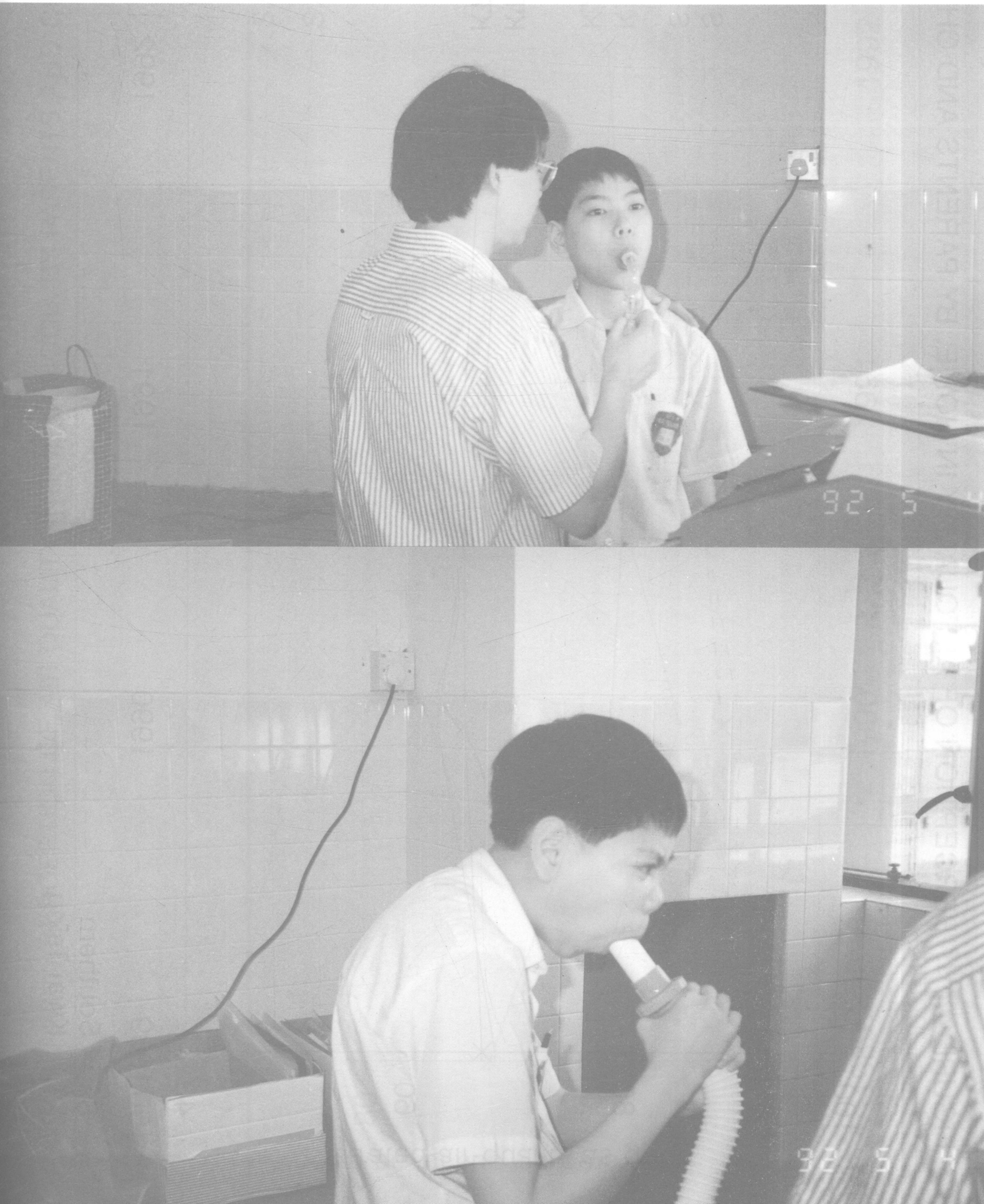


FIGURE 4.1 PERCEPTION OF AIR QUALITY IN HOME, BY PARENTS AND CHILDREN

FIGURE 4.2 PERCEPTION OF AIR QUALITY IN THE SCHOOL, BY PARENTS AND CHILDREN

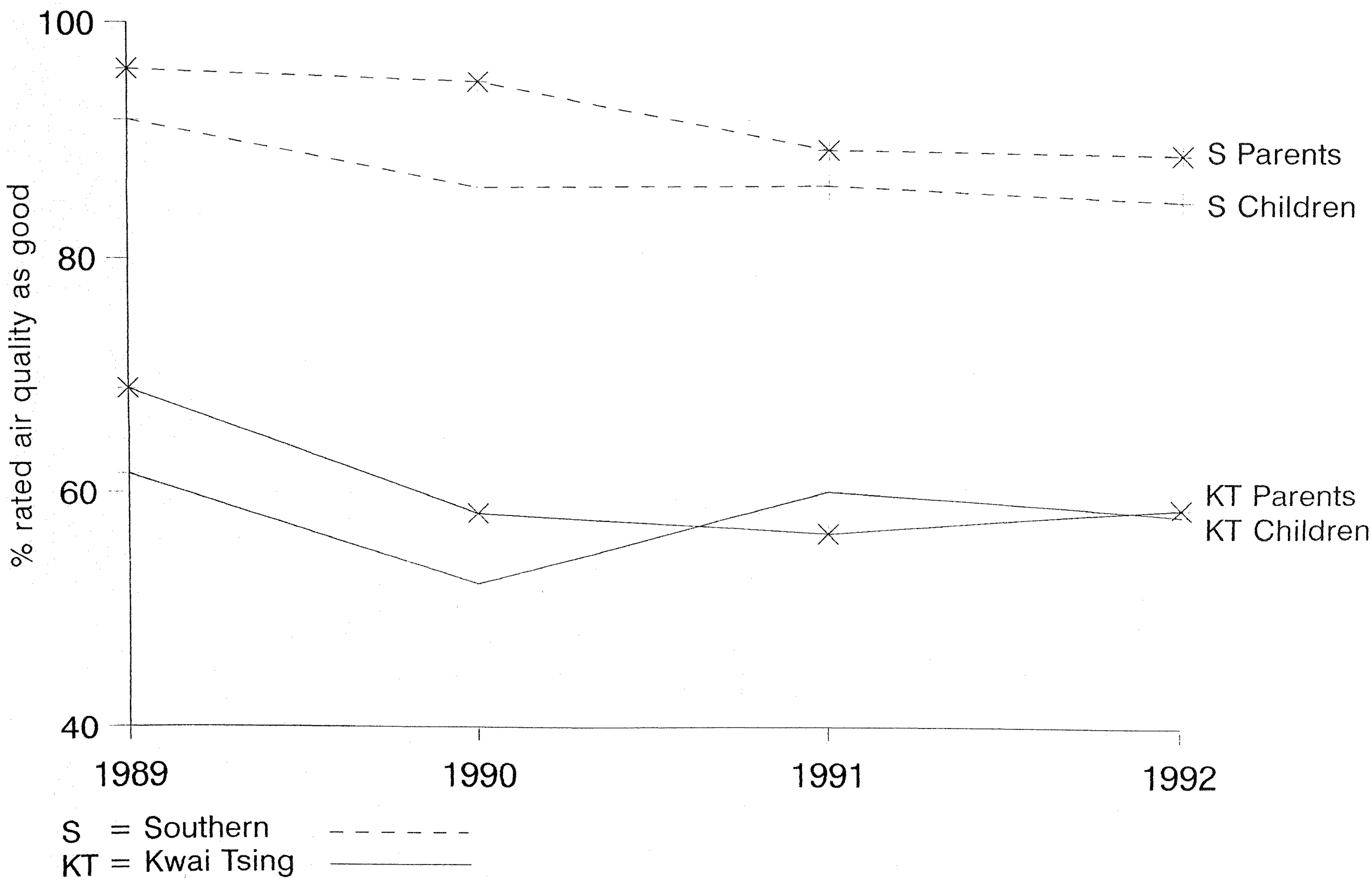


FIGURE 7.1· Total rainfall monthly averages

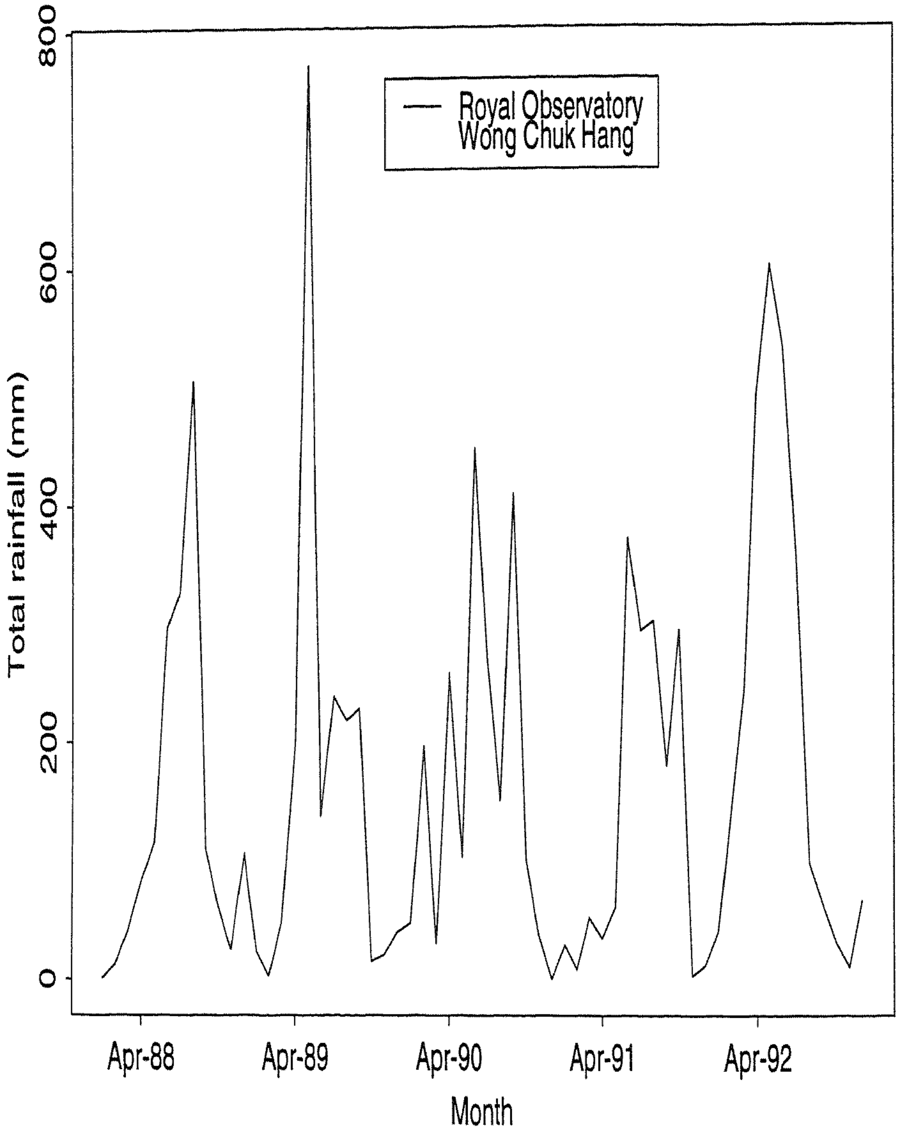


FIGURE 7 2 Relative humidity monthly averages

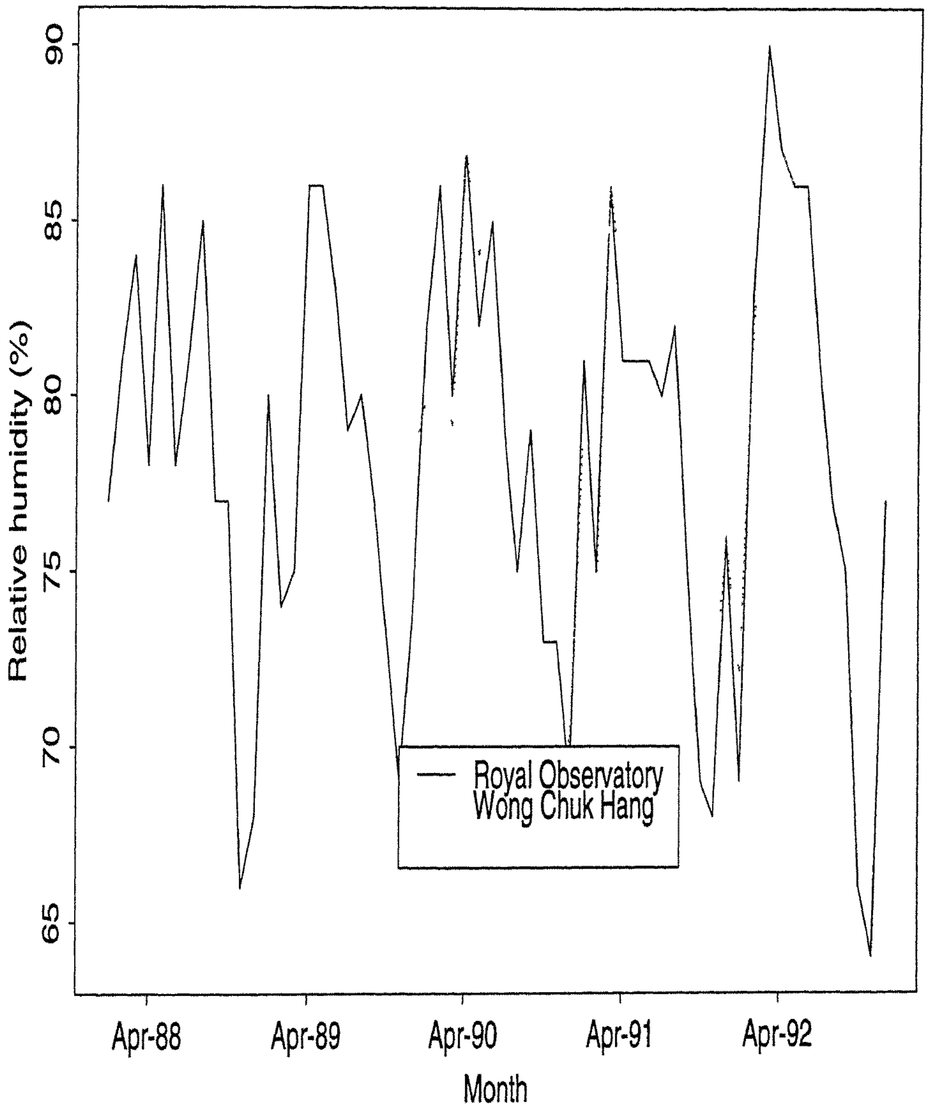


FIGURE 9.1: Relationship between the regression line, BR slope and PD20 for a subject

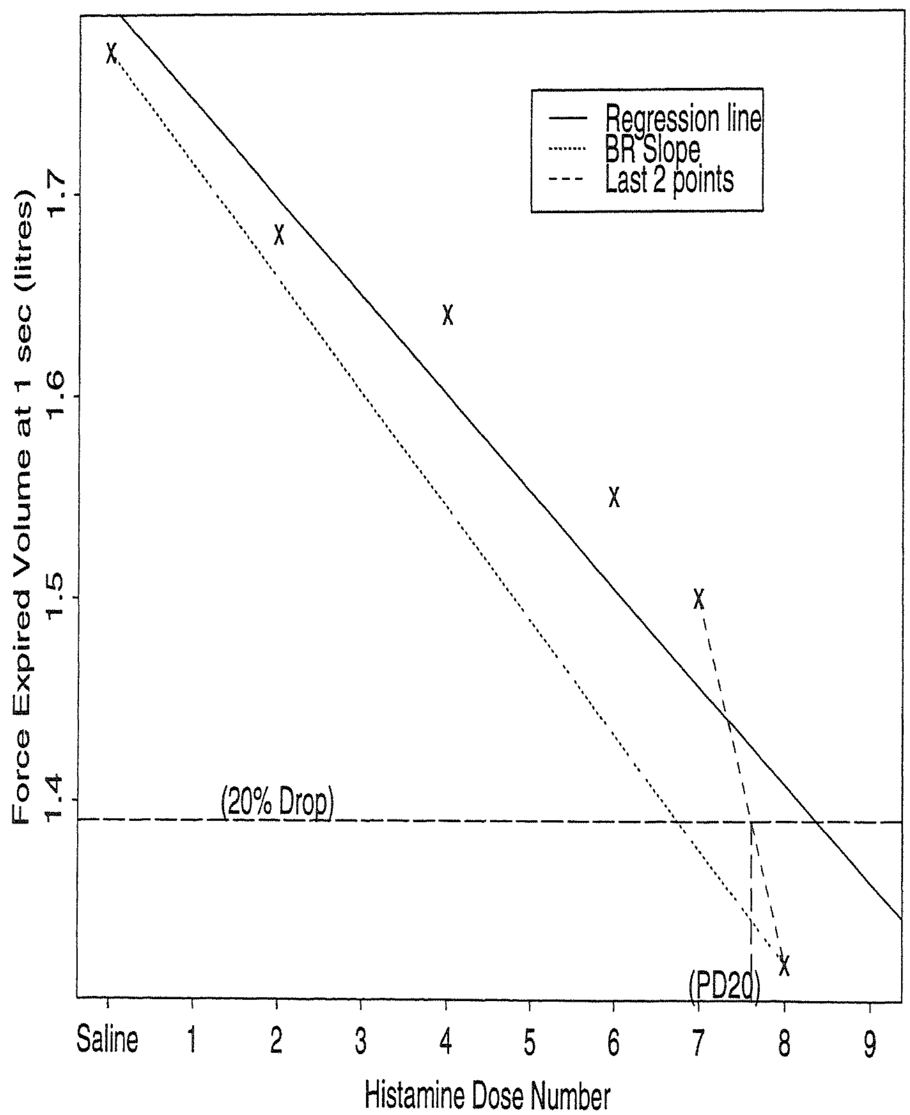


FIGURE 9.2: Scatterplots for pairs of broncho-responsiveness measures - 1990

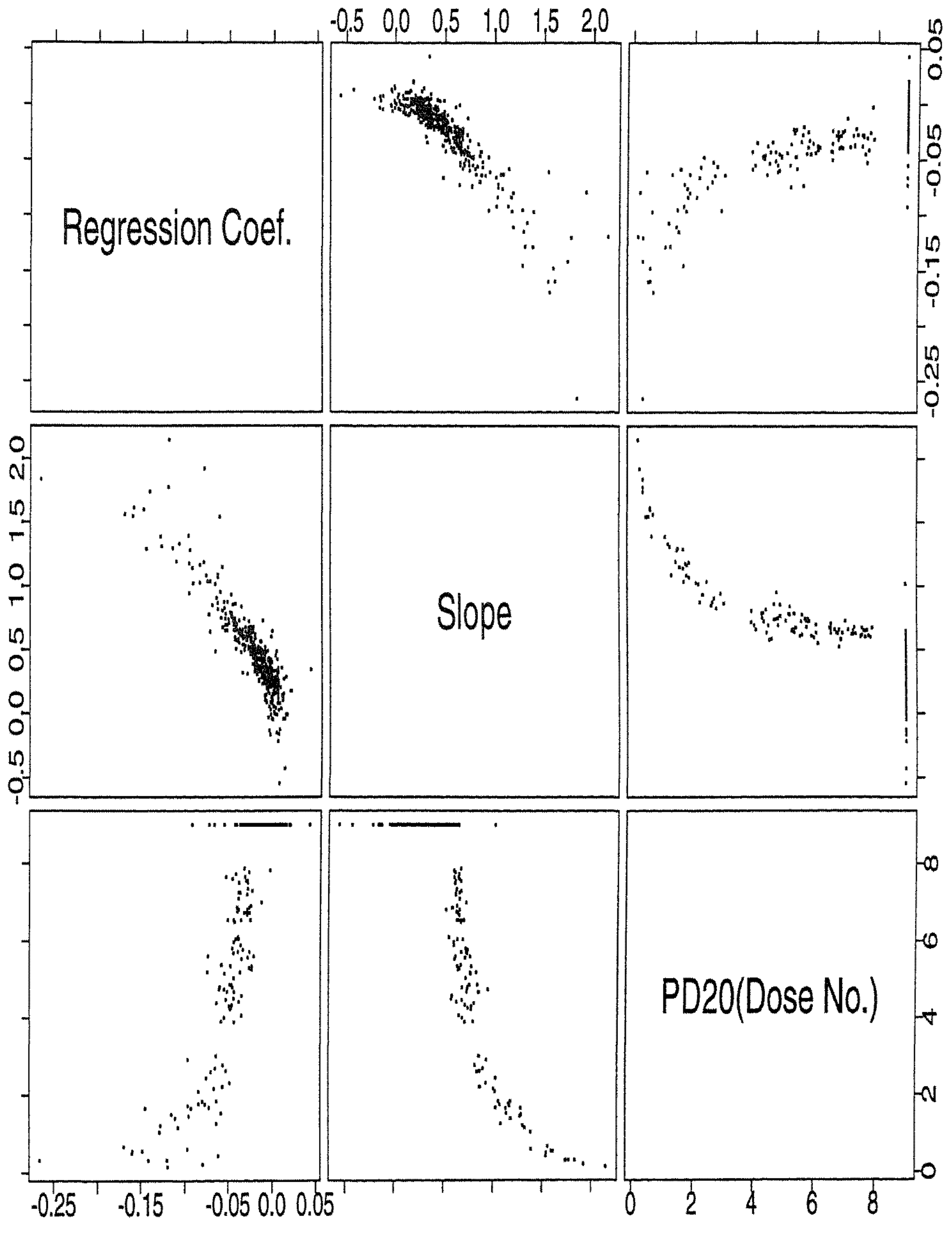


FIGURE 9.3: Scatterplots for pairs of broncho-responsiveness measures - 1991

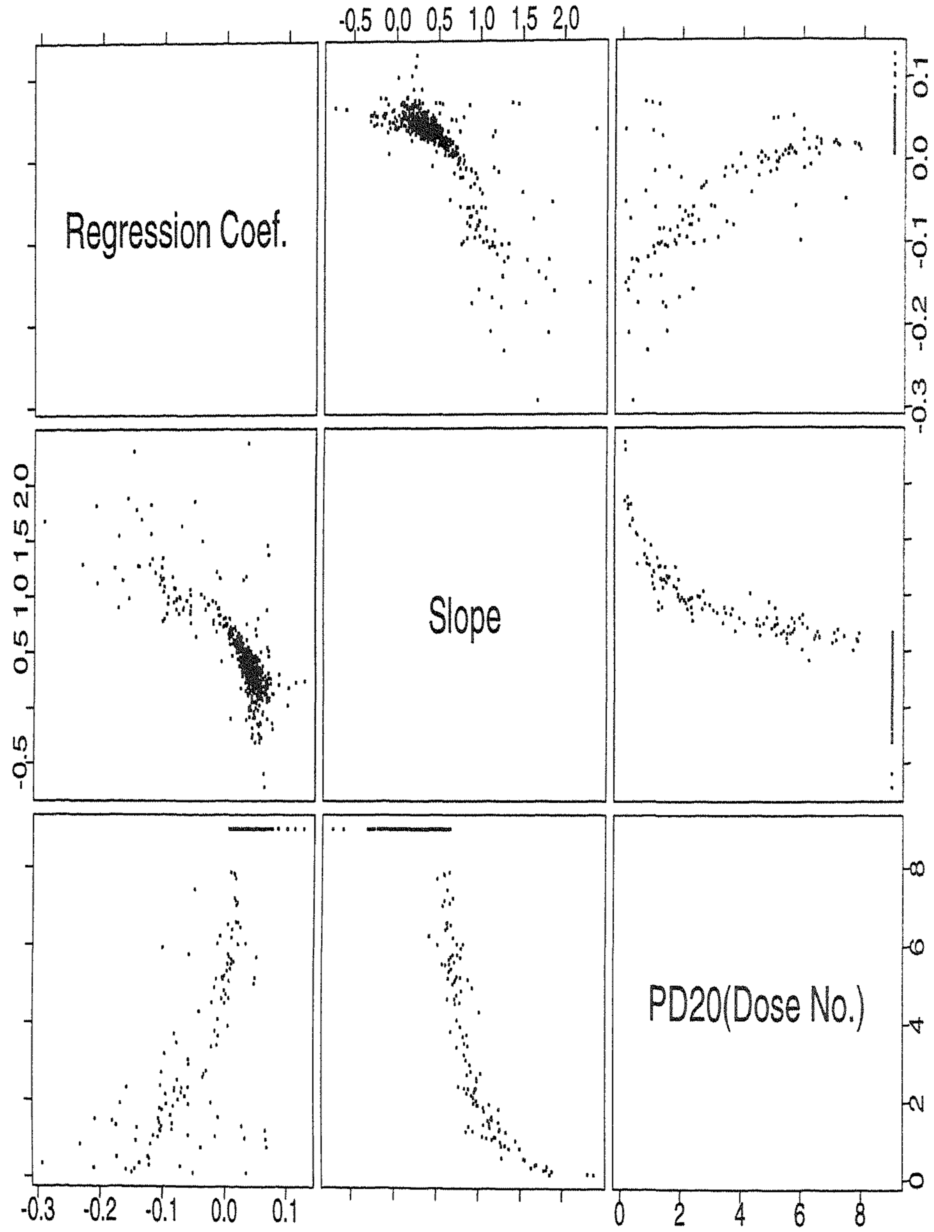


FIGURE 9.4: Scatterplots for pairs of broncho-responsiveness measures - 1992

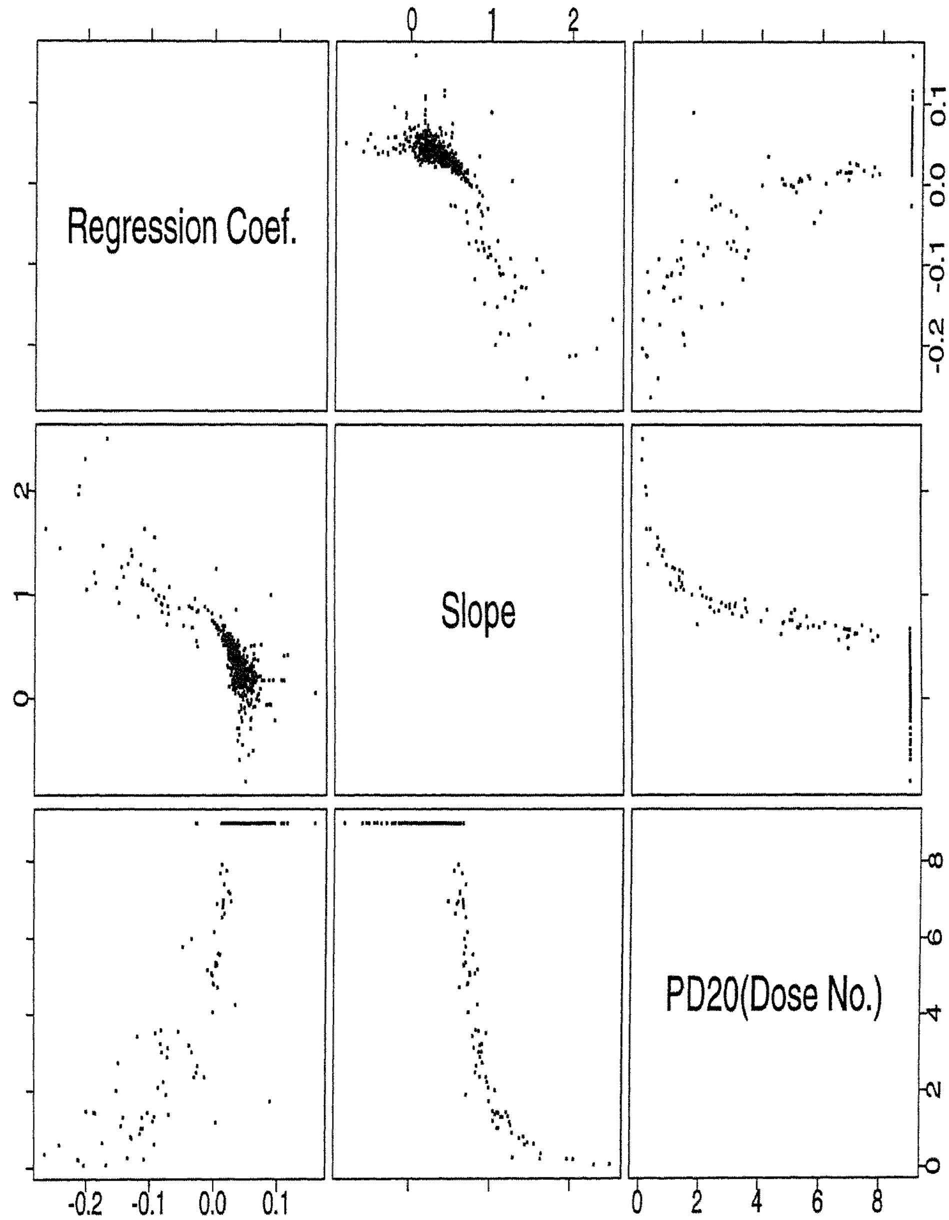


FIGURE 9.5: Scatterplots for pairs of anthropometric and lung function measures - 1990

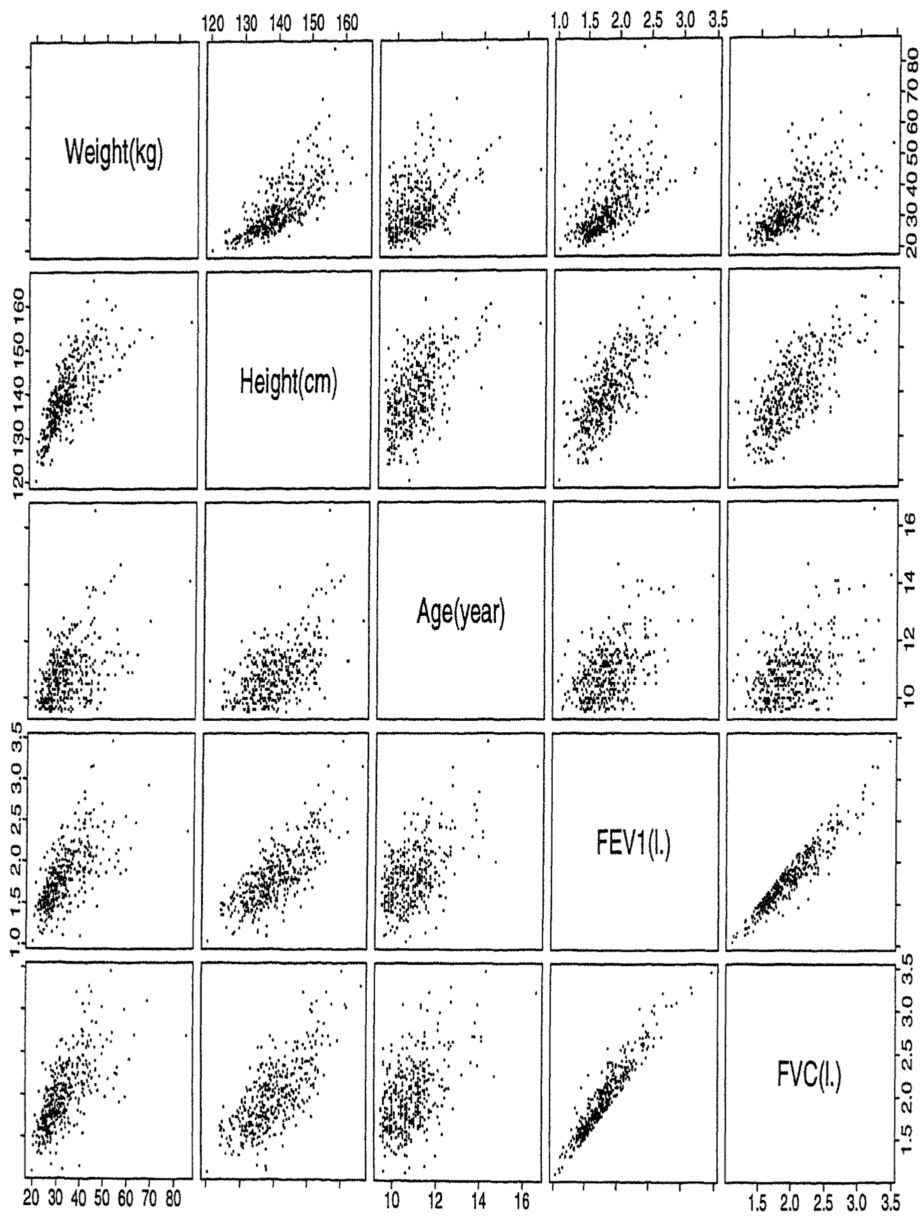


FIGURE 9.6: Scatterplots for pairs of anthropometric and lung function measures - 1991

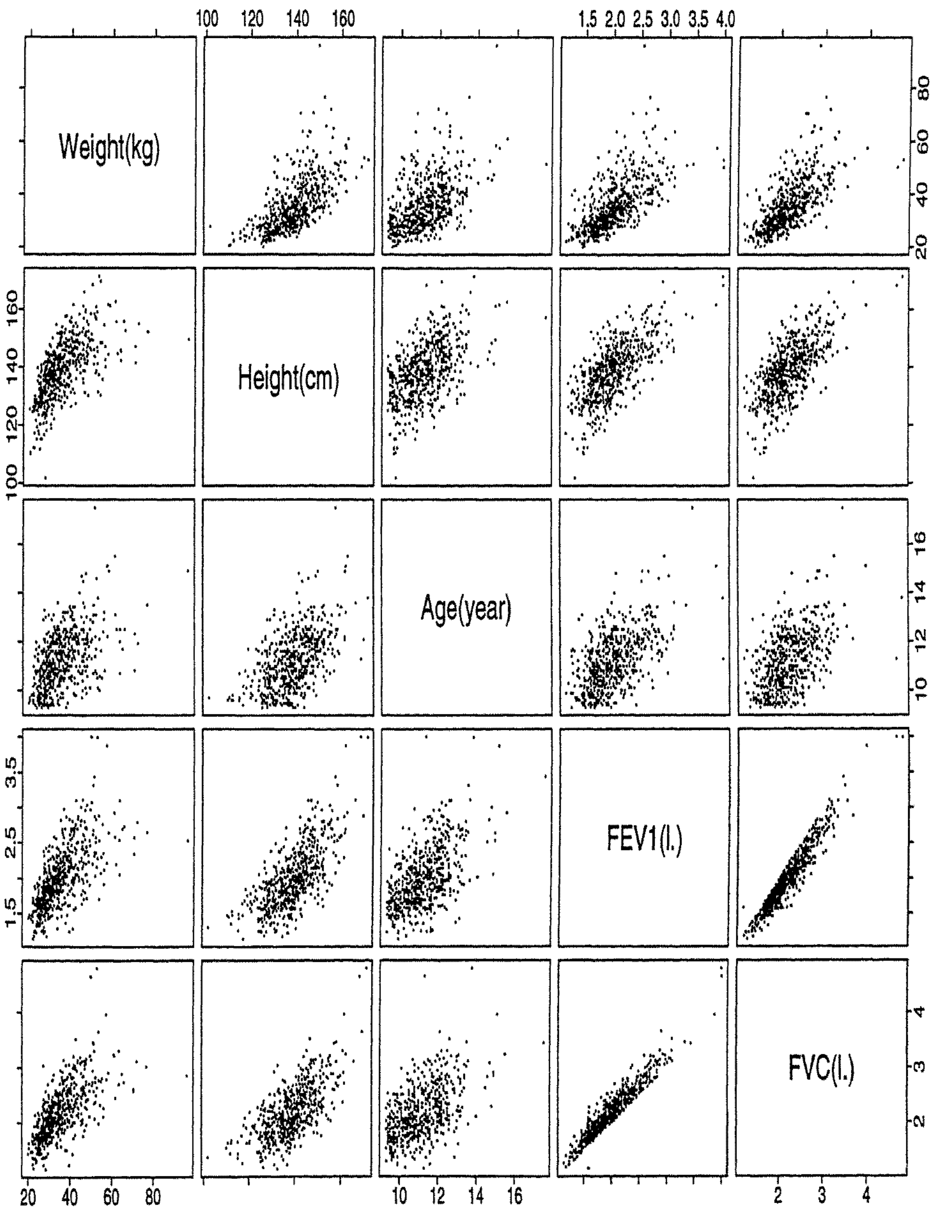


FIGURE 9.7: Scatterplots for pairs of anthropometric and lung function measures - 1992

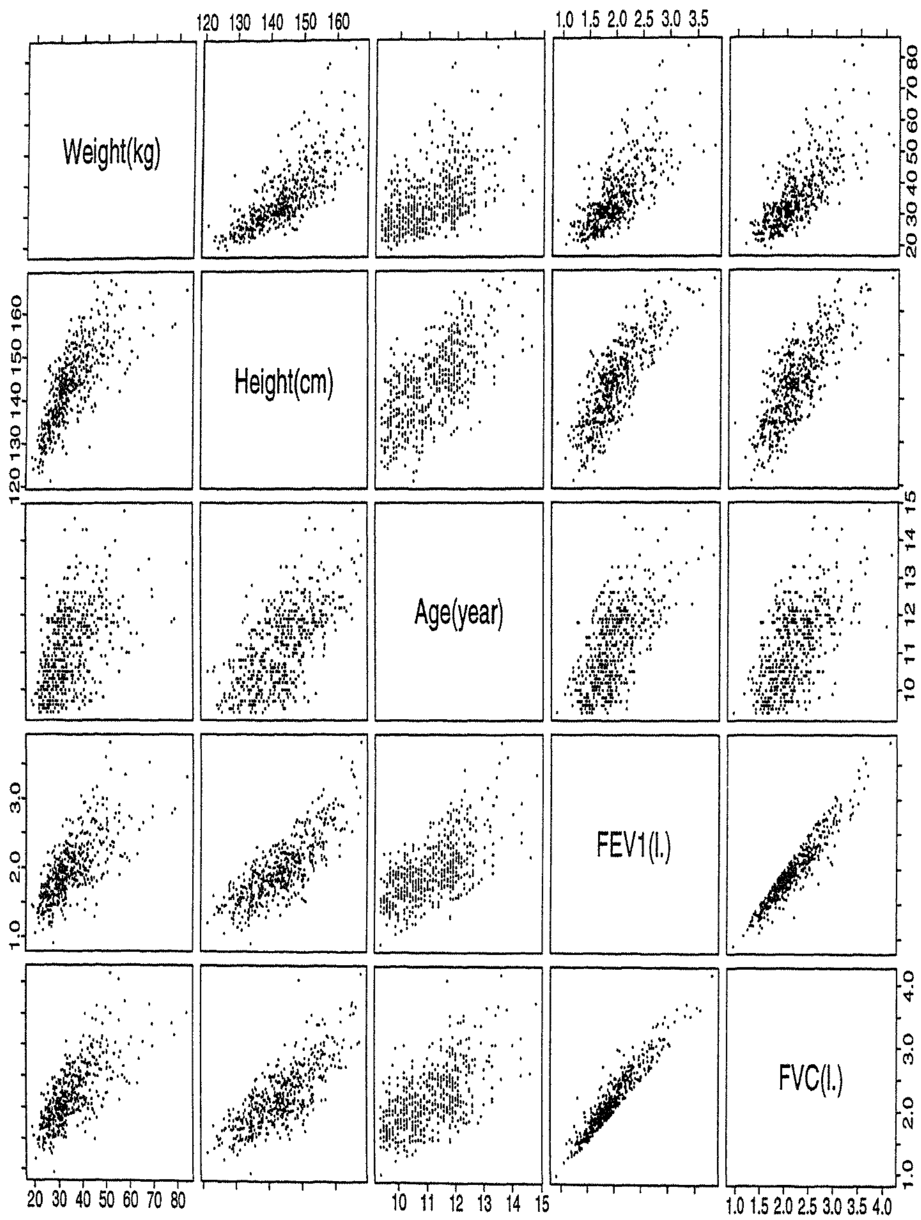


FIGURE 10.1 : Population attributable risk for any cough, phlegm, wheezing, nasal symptoms - relative risk estimated from 1989-90 data

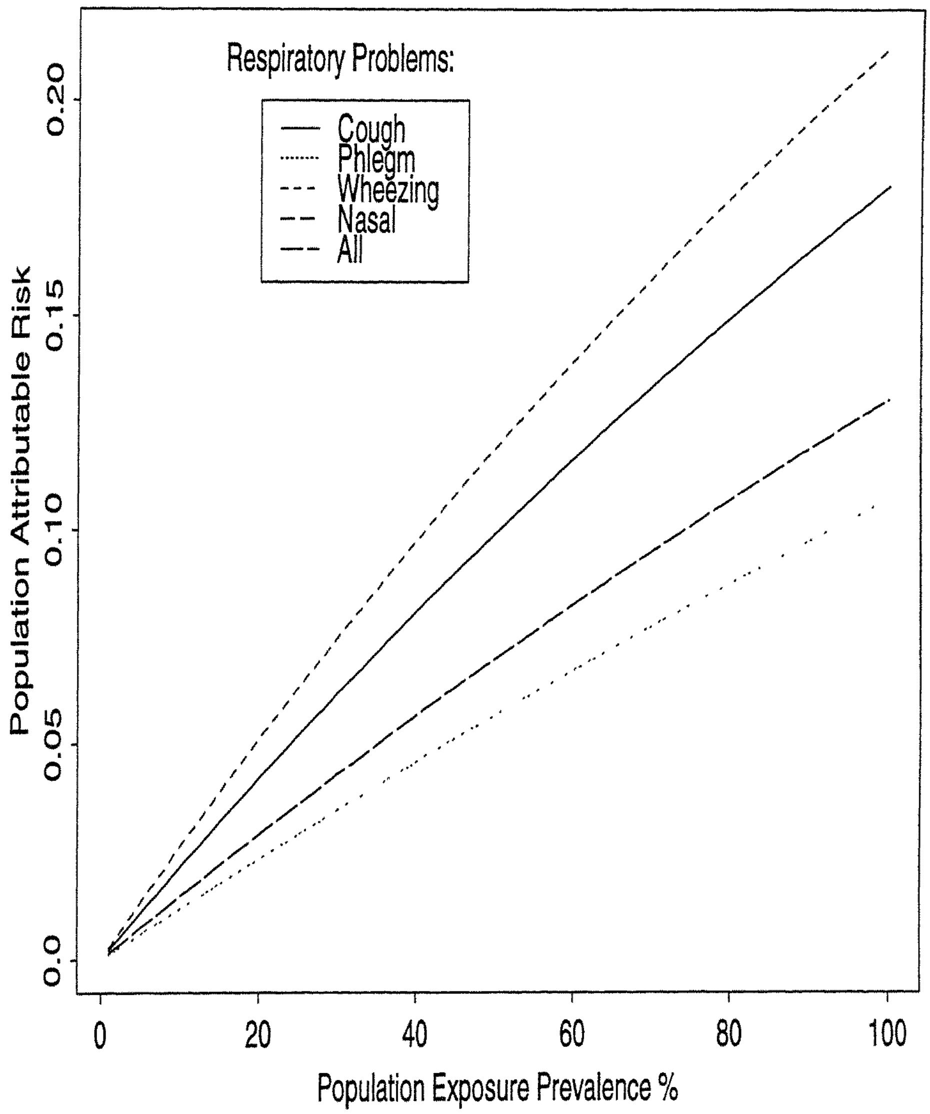


FIGURE 10 2 Prediction of the number of cases preventable by pollution controls, for any of the respiratory symptoms in Kwai Tsing children, 8-11 years of age, if the proportion of the population at-risk exposed to air pollution similar to that in Kwai Tsing in 1989-90 is reduced (by 0% to 100%)

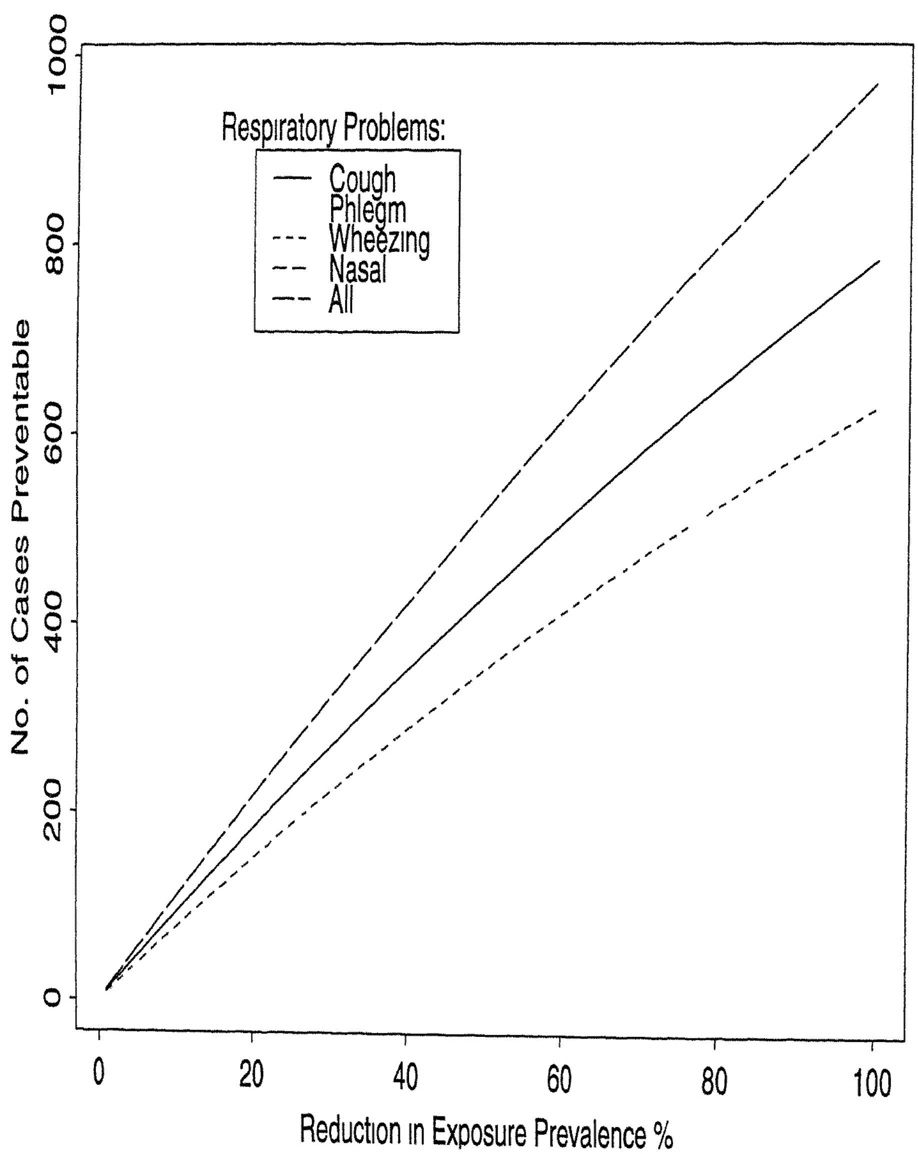


FIGURE 10 3 Prediction of the number of cases preventable by pollution controls, for any of the respiratory symptoms in Hong Kong children, 8-11 years of age, if the proportion of the population at-risk exposed to air pollution similar to that in Kwai Tsing in 1989-90 is reduced (by 0% to 50%)

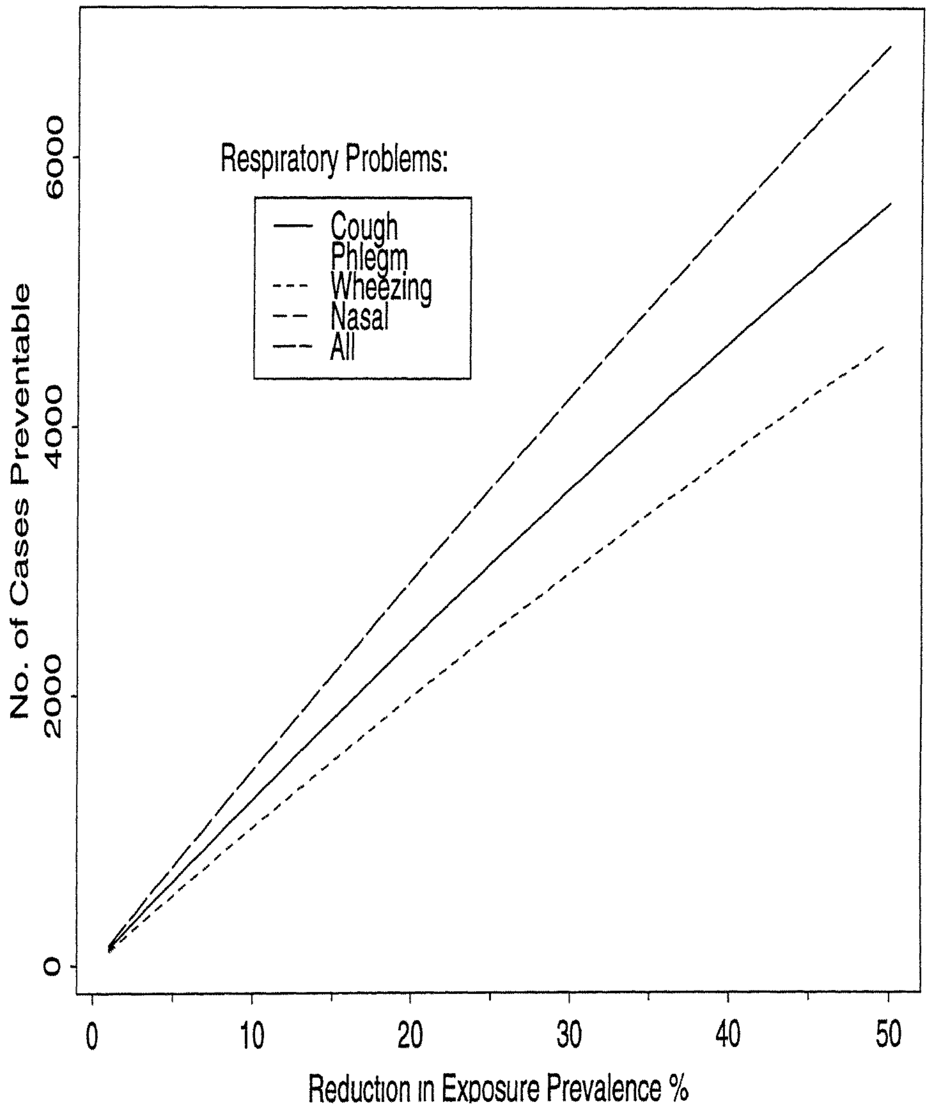


FIGURE 10.4: Prediction of the number of cases preventable by pollution controls, for any of the respiratory symptoms in Kwai Tsing children, 0-11 years of age, if the proportion of the population at-risk exposed to air pollution similar to that in Kwai Tsing in 1989-90 is reduced (by 0% to 100%)

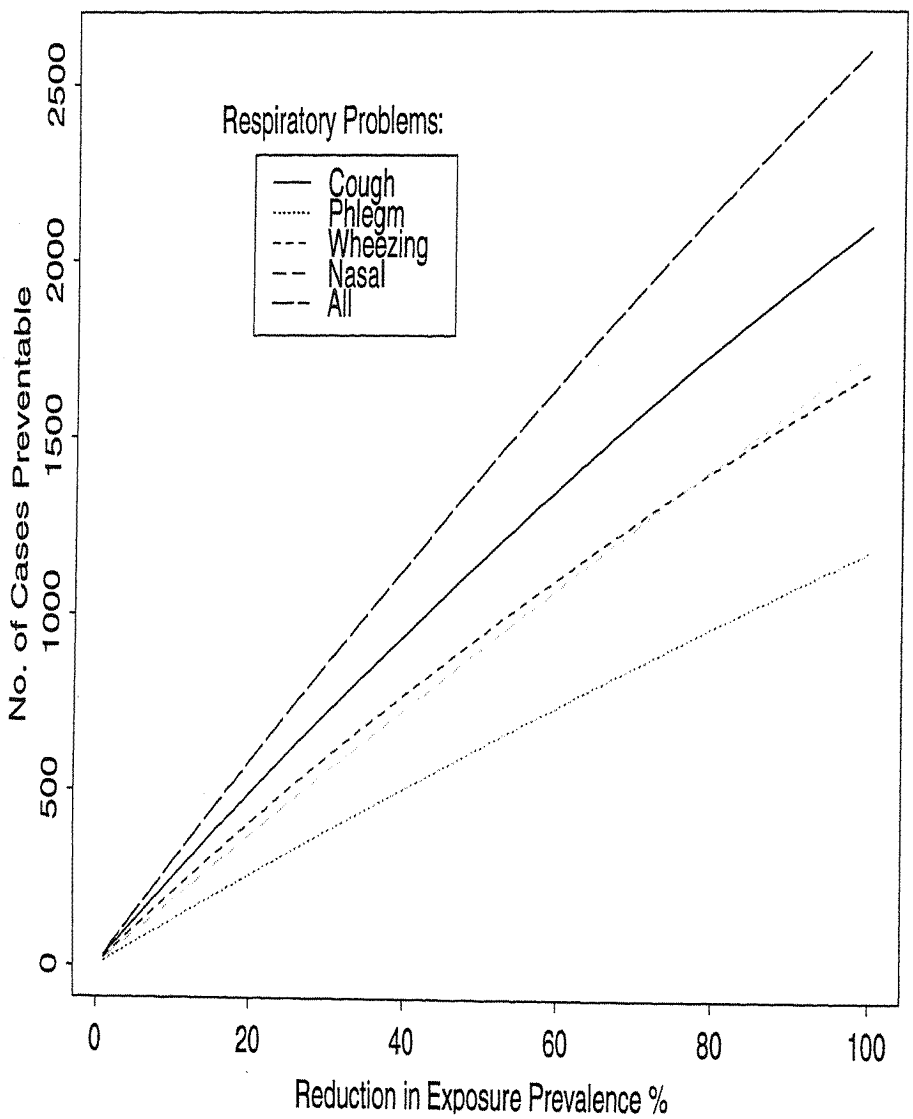


FIGURE 10.5: Prediction of the number of cases preventable by pollution controls, for any of the respiratory symptoms in Hong Kong children, 0-11 years of age, if the proportion of the population at-risk exposed to air pollution similar to that in Kwai Tsing in 1989-90 is reduced (by 0% to 50%)

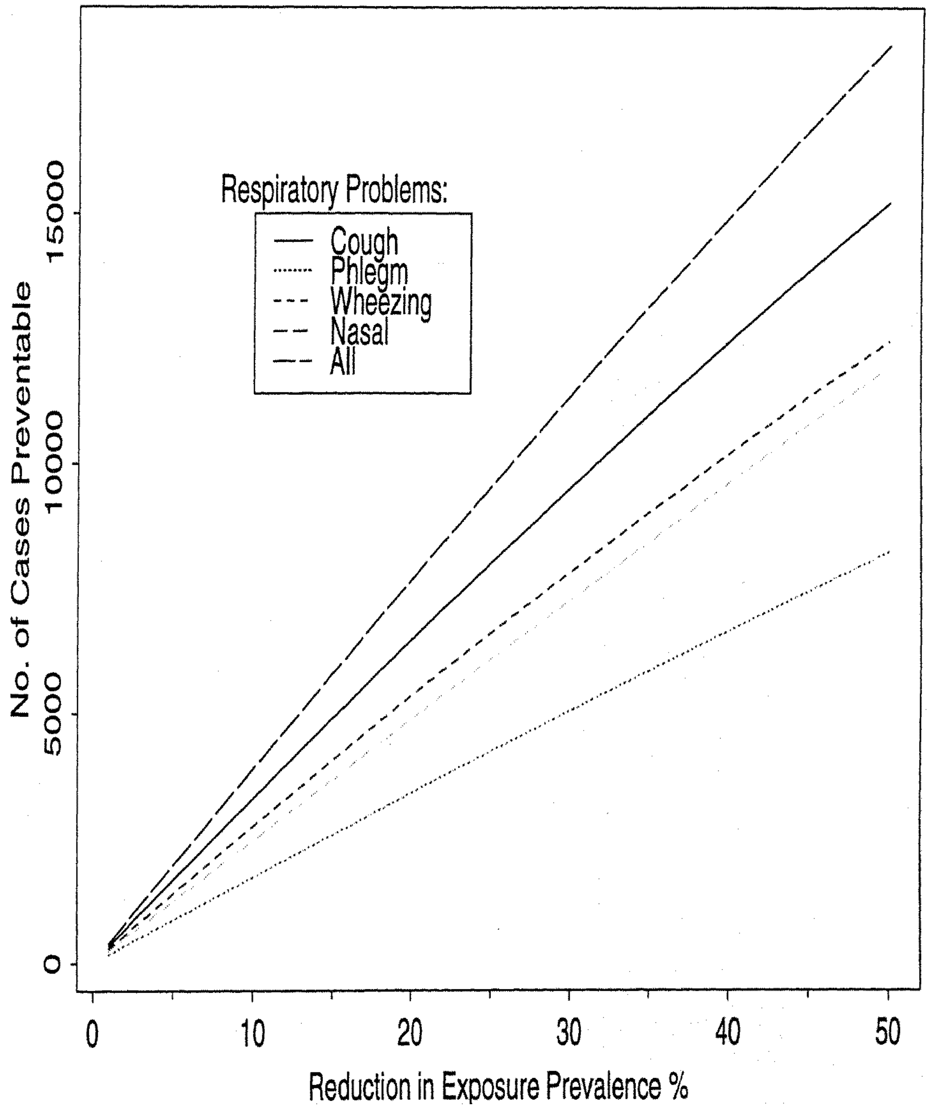


FIGURE 10.6 THE RISK OF LIVING IN POLLUTED AIR

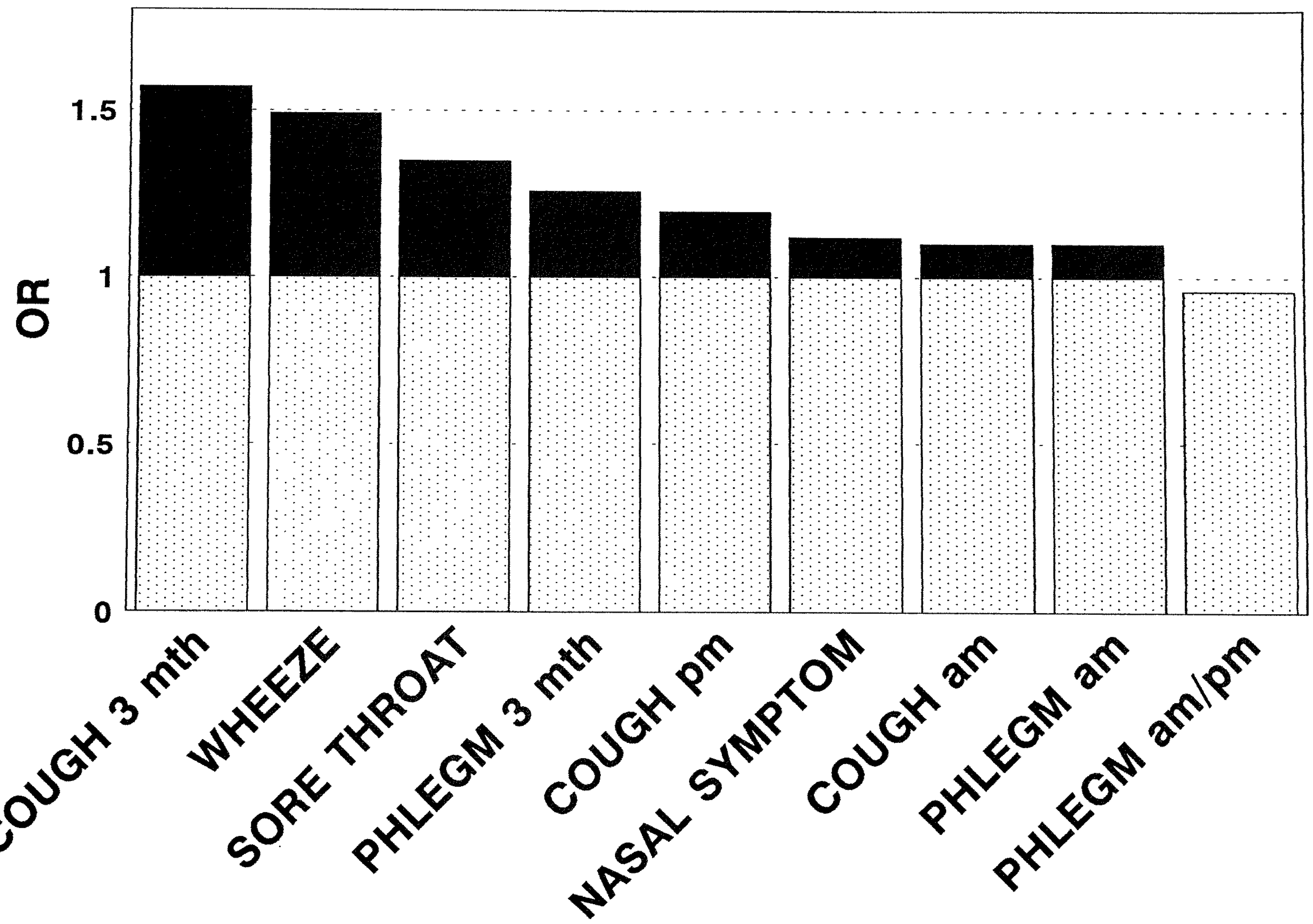


FIGURE 10.7 THE BENEFITS OF INTERVENTION

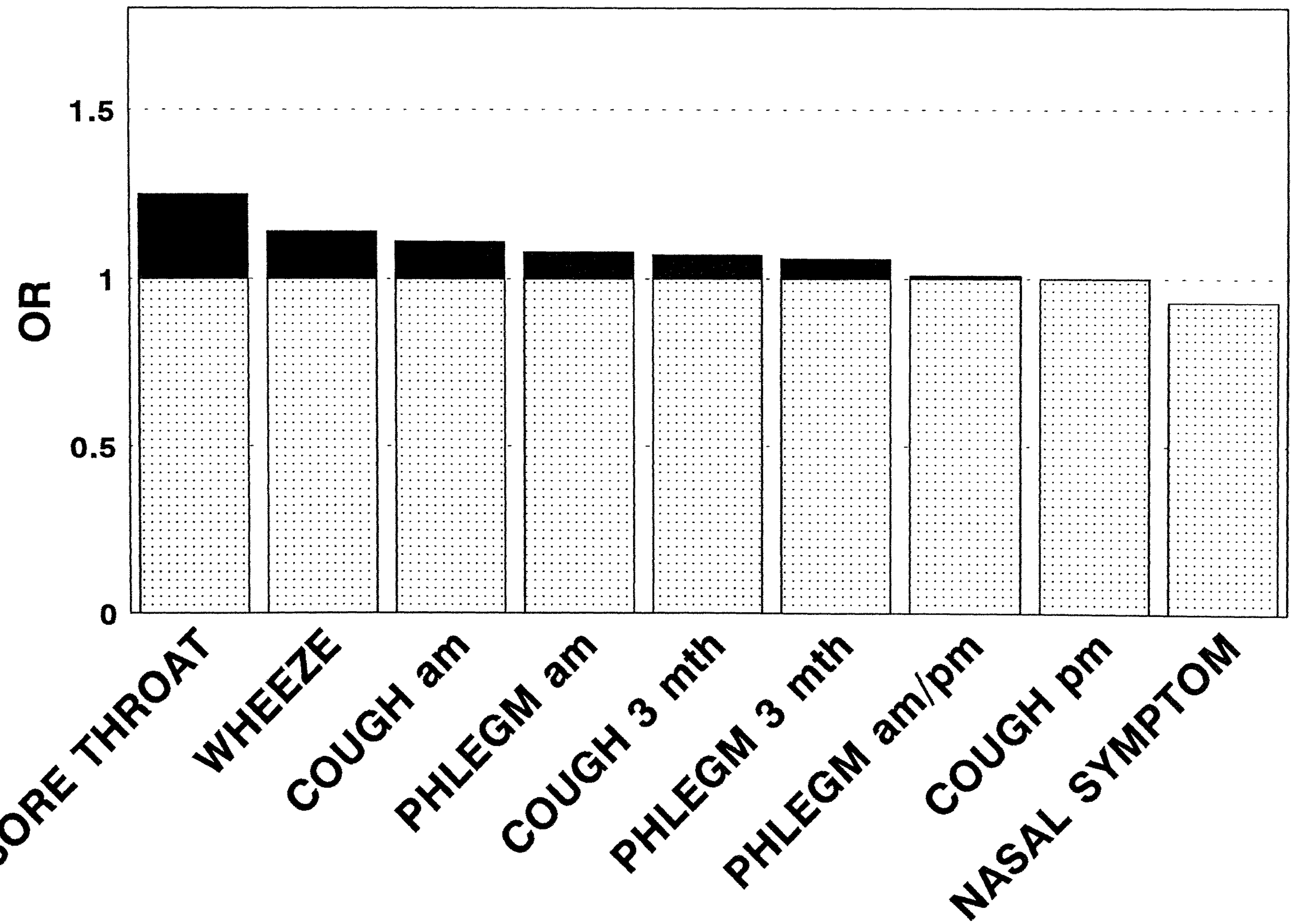
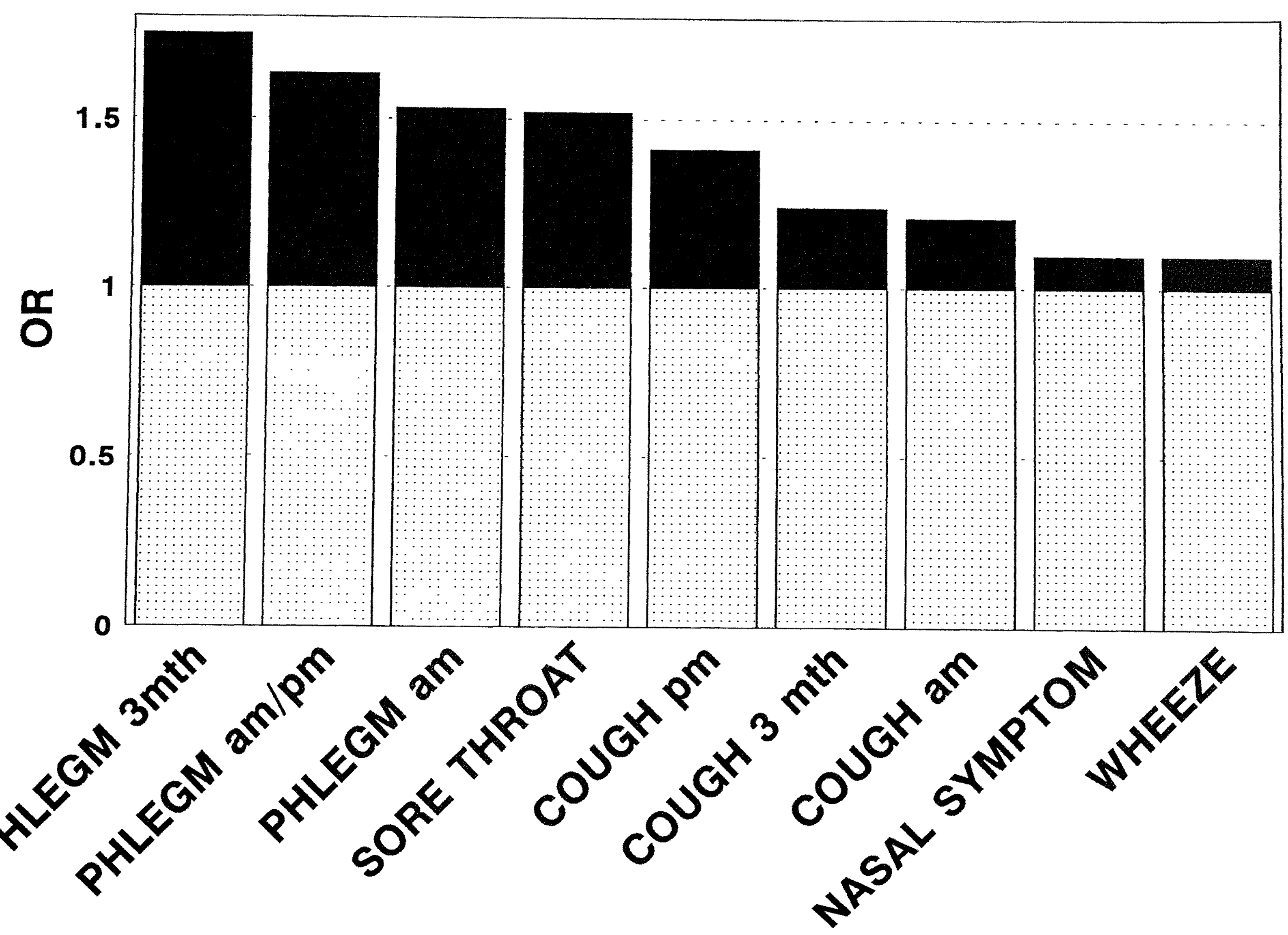


FIGURE 10.8 THE RISK OF EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE



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TABLES

Table 2.1.1: Schoools participating in the study, by district

Southern	Kwai Tsing
Chi Nam	Chui Oi
CK Law	Father Cucchiara
Hok Shan	Lai Chack
Lo Pan	Shek Lei
Pokfulam	Ta Tung
Precious Blood	Wellwisher
Pui Tak	Yan Laap
St Peters	

Table 3.1.1: Number sampled of total population available by survey year

	Survey year			
	1989	1990	1991	1992
No. on school register	3920	3552	9776	10758
No. absent on day of fieldwork	49 1.4%	39 1.1%	119 1.2%	161 1.7%
No. in final data set	3521	3513	9657	10597

Table 3.1.2: Summary of data set studied by survey year

		Survey year							
		1989		1990		1991		1992	
District		S	KT	S	KT	S	KT	S	KT
Schools:	am	3	5	3	5	6	7	6	7
	pm	3	4	3	4	6	6	6	5
	all day	2	0	2	0	2	0	2	0
	Total	8	9	8	9	14	13	14	13
Primary grades:	P3	12	17	0	0	41	39	39	37
	P4	13	17	12	17	41	42	41	39
	P5	0	0	13	17	26	27	42	42
	P6	0	0	0	0	26	19	26	26
	Total	25	34	25	34	134	137	148	144
Children:	Boys	852	1075	836	1076	2509	2454	2747	2600
	Girls	788	806	650	951	2430	2264	2791	2459
	Total	1640	1881	1486	2027	4939	4718	5538	5059
Histamine group				222	201	302	277	303	221

Table 3.1.3: Sampling fraction percentage by district, by gender, by age and by survey year

District	Gender	Age (years)	Survey year 1989	1990	1991	1992	1991 Census population
Southern	Boys	8	12	0	20	22	1932
		9	21	10	37	35	1862
		10	10	19	31	37	1951
		11	1	12	26	34	1803
		12	0	2	13	14	2002
		≥13	0	0	3	4	1824
	Total		7	7	22	24	11374
	Girls	8	13	0	24	25	1752
		9	15	10	42	38	1846
		10	6	16	32	43	1870
		11	1	8	23	35	1726
		12	0	1	11	12	1742
		≥13	0	0	3	2	1716
	Total		6	6	23	26	10652
Kwai Tsing	Boys	8	8	0	13	10	3274
		9	14	6	19	20	3717
		10	8	13	16	20	3415
		11	1	9	15	17	3218
		12	0	2	8	8	3311
		≥13	0	1	3	2	3397
	Total		5	5	12	13	20032
	Girls	8	9	0	13	11	3134
		9	13	8	20	21	3162
		10	7	14	18	21	3010
		11	1	8	13	18	3092
		12	0	1	8	7	3068
		≥13	0	0	1	2	3068
	Total		5	5	12	13	18534

Table 3.1.4: Number of children studied by district, by school, by primary grade and by survey year

		Primary grade															
		3				4				5				6			
District	School	1989	1990	1991	1992	1989	1990	1991	1992	1989	1990	1991	1992	1989	1990	1991	1992
Southern	11	278	1	323	292	257	269	303	311	-	250	275	296	-	-	231	265
	12	30	-	56	35	38	30	43	59	-	40	60	44	-	-	74	58
	13	106	-	79	86	135	110	109	90	-	125	104	116	-	-	134	112
	14	30	-	51	31	38	33	40	62	-	39	39	60	-	-	40	39
	15	-	-	330	337	-	-	334	340	-	-	173	343	-	-	166	171
	16	304	9	297	314	288	297	305	313	-	275	297	300	-	-	260	296
	17	-	-	161	158	-	-	160	153	-	-	-	156	-	-	-	-
	18	-	-	242	241	-	-	308	223	-	-	-	301	-	-	-	-
Kwai Tsing	21	290	12	253	285	293	280	266	272	-	275	269	267	-	-	264	256
	22	105	1	61	37	91	105	74	68	-	101	102	80	-	-	98	103
	23	78	-	42	35	102	82	54	42	-	118	80	58	-	-	116	77
	24	141	-	126	124	198	152	152	130	-	203	157	151	-	-	190	154
	25	343	-	383	382	376	335	341	374	-	357	321	327	-	-	348	318
	26	-	-	225	203	-	-	243	223	-	-	-	223	-	-	-	-
	27	-	-	320	322	-	-	300	322	-	-	-	304	-	-	-	-

Table 3.1.5: Number of children studied by district, by primary grade, by gender and by survey year

District	Primary grade	Boys				Girls			
		1989	1990	1991	1992	1989	1990	1991	1992
Southern	3	411	8	735	728	337	2	785	755
	4	441	400	767	743	451	339	825	781
	5	0	428	509	777	0	309	425	824
	6	0	0	498	499	0	0	395	431
Kwai Tsing	3	506	10	732	692	315	9	673	675
	4	569	500	730	726	491	454	676	681
	5	0	566	464	728	0	488	445	658
	6	0	0	528	454	0	0	470	445
Total		1927	1912	4963	5347	1594	1601	4694	5250

Table 3.1.6: Number of children studied by district, by age, by gender and by survey year

District	Age (years)	Boys				Girls			
		1989	1990	1991	1992	1989	1990	1991	1992
Southern	8	234	0	392	427	228	0	421	445
	9	398	194	682	649	285	186	780	695
	10	191	380	600	721	117	292	599	805
	11	26	212	506	610	18	140	395	600
	12	3	45	268	274	4	24	187	216
	≥13	0	5	61	66	0	8	48	30
	Total	852	836	2509	2747	652	650	2430	2791
Kwai Tsing	8	268	0	428	314	293	0	412	336
	9	483	220	658	688	420	246	639	670
	10	261	453	546	681	204	407	534	643
	11	43	305	474	563	20	254	407	543
	12	12	64	258	273	5	35	231	214
	≥13	7	34	90	81	0	9	41	53
	Total	1074	1076	2454	2600	942	951	2264	2459
Total		1926	1912	4963	5347	1594	1601	4694	5250

(one child's age in 1989 was unknown)

Table 3.2.1: Absences by district, by school, by primary grade and by survey year

School		1989			1990			1991					1992				
		P3	P4	Total	P4	P5	Total	P3	P4	P5	P6	Total	P3	P4	P5	P6	Total
S	11	7	10	17	10	7	17	1	2	4	5	12	3	12	4	8	27
	12	0	0	0	0	0	0	0	0	1	1	2	0	1	0	0	1
	13	3	3	6	2	4	6	4	3	4	4	15	1	3	0	3	7
	14	0	0	0	0	1	1	0	1	0	0	1	0	1	3	0	4
	15	2	0	-	-	-	-	4	0	5	1	10	0	3	1	1	5
	16	5	3	8	0	1	1	4	4	5	2	15	2	7	3	3	15
	17	-	-	-	-	-	-	1	1	-	-	2	4	6	1	-	11
	18	-	-	-	-	-	-	3	3	-	-	6	3	6	2	-	11
Total S		12	13	25	12	13	25	17	14	19	13	63	13	39	14	15	81
KT	21	4	2	6	0	0	0	2	3	5	1	11	1	4	1	1	7
	22	1	0	1	1	0	1	0	2	3	1	6	0	1	4	0	5
	23	0	0	0	4	3	7	0	1	0	2	3	1	0	1	0	2
	24	8	4	12	0	0	0	0	3	0	5	8	2	5	6	4	17
	25	5	0	5	5	1	6	2	4	3	2	11	3	3	5	4	15
	26	-	-	-	-	-	-	1	3	-	-	4	9	6	2	-	17
	27	-	-	-	-	-	-	4	9	-	-	11	8	5	4	-	17
Total KT		18	6	24	10	4	14	9	25	11	11	56	24	24	23	9	80
Total		30	19	49	22	17	39	26	39	30	24	119	37	63	37	24	161
Abs/class (S)		1.0	1.0	1.0	0.6	0.6	0.6	0.4	0.3	0.7	0.5	0.5	0.3	1.0	0.3	0.6	0.5
Abs/class (KT)		1.1	0.4	0.7	0.4	0.1	0.3	0.2	0.6	0.4	0.4	0.4	0.5	0.6	0.5	0.3	0.6
Total Abs/class		1.1	0.6	0.8	0.5	0.3	0.4	0.3	0.5	0.6	0.4	0.4	0.5	0.8	0.4	0.5	0.6

Table 3.3.1: Percentage of missing answers to individual questions on children's questionnaire by district and by survey year

Variable	1989		1990		1991		1992	
	S	KT	S	KT	S	KT	S	KT
Gender	0	0	0	0	0	0	0	0
Date of birth	0	0.0	0	0	0	0	0	0
Respiratory symptoms								
Sore throat	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Morning cough	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1
Evening cough	0.4	0.6	0.4	0.2	0.1	0.1	0.2	0.0
Cough for 3 months	0.2	0.2	0.3	0.2	0.0	0.1	0.2	0.1
Phlegm in morning	0.1	0.3	0.1	0.0	0.0	0.1	0.1	0.1
Phlegm day or night	0.1	0.3	0.1	0.0	0.1	0.2	0.1	0.1
Phlegm for 3 months	0.2	0.2	0.1	0.2	0.0	0.2	0.1	0.1
Wheezing	0.7	0.7	0.7	0.6	0.3	0.4	0.2	0.3
Diagnosed asthmatic	0.7	1.7	0.2	0.1	0.5	0.7	0.6	0.5
Nasal symptoms	0.1	0.2	0.6	1.3	0.1	0.2	0.2	0.1
Diagnosed allergic rhinitis	0.3	0.5	0.6	0.1	0.1	0.1	0.2	0.2
Diagnosed sinusitis	0.6	0.6	0.1	0.3	0.2	0.1	0.2	0.2
Smoking								
Father smokes	0.1	0.4	0.1	0.2	0.4	0.9	0.2	0.3
Mother smokes	0.5	0.8	0.1	0.0	0.4	0.8	0.3	0.2
Smoking brothers/sisters, at home	0.1	0.7	0.3	0.0	0.3	0.5	0.4	0.3
Other people at home who smoke	0.2	0.8	0.4	0.0	0.4	1.2	0.8	1.2
Child smokes	0.6	0.7	0.6	0.5	0.4	0.9	0.2	0.2
The environment and air quality								
Air quality at home	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.0
Air quality at school (indoors)	0.2	0.3	0.0	0.5	0.1	0.2	0.1	0.0

Table 3.3.2: Mean percentage of missing answers to individual questions on children's questionnaire by age, by primary grade, and by survey year

		Survey year				
		1989	1990	1991	1992	Mean
Age (years)	8	0.6	-	0.6	0.3	0.5
	9	0.3	0.1	0.5	0.3	0.3
	10	0.4	0.2	0.5	0.2	0.3
	11	0.3	0.1	0.3	0.1	0.2
	12	-	0.2	0.3	0.1	0.1
	≥13	-	-	0.8	0.2	0.4
Primary grade	3	0.6	-	0.7	0.5	0.6
	4	0.3	0.2	0.5	0.3	0.3
	5	-	0.2	0.4	0.2	0.3
	6	-	-	0.2	0.2	0.2

Table 3.3.3: Percentage of missing answers to individual questions in parents' questionnaire by district and by survey year

Variable	1989		1990		1991		1992	
	S	KT	S	KT	S	KT	S	KT
Relationship of form filler	5.1	6.8	2.7	3.7	1.5	1.8	1.1	0.4
The child's living quarters								
Type of housing	3.0	4.1	1.2	1.5	4.1	3.3	2.6	3.6
Size of living quarters	20.4	27.2	20.0	26.3	22.7	23.7	18.5	20.0
Type of cooking fuel	3.0	3.0	1.3	2.3	2.5	1.6	2.0	2.3
People living with child					2.3	2.3	1.4	2.0
Parents' occupational and education								
Mother living with child	7.3	9.1	4.3	4.7	4.5	4.5	3.2	4.6
Father living with child	10.2	12.1	5.8	6.9	6.2	6.2	5.3	7.0
Mother currently employed	25.0	27.6	6.3	6.7	15.2	17.5	12.8	17.5
Father currently employed	17.1	20.8	8.2	8.5	10.6	11.9	9.4	12.3
Occupation of mother	-	-	-	-	7.2	6.3	5.9	6.5
Occupation of father	-	-	-	-	7.5	7.3	6.3	8.2
Education of mother	6.8	7.2	2.8	2.8	3.7	3.0	3.0	3.4
Education of father	8.1	8.1	4.1	3.9	4.7	4.2	3.8	5.0
Air quality								
Indoor air quality in child's quarters	2.3	3.2	2.7	3.9	4.7	5.2	3.7	5.8
Air quality in child's living quarters	2.2	3.4	2.9	4.2	4.8	5.1	3.8	5.9
Air quality at child's school	2.6	4.5	3.2	5.2	5.2	6.4	4.2	7.2
Air quality in district where child lives	3.8	4.9	3.9	5.4	5.8	6.5	4.9	7.8
Air quality in district where child plays	5.1	7.6	4.9	8.8	6.8	8.4	5.6	9.2
Incense used in child's quarters	3.8	4.9	4.1	5.7	6.1	6.7	5.5	7.4
Mosquito coils in child's quarters	8.4	10.3	5.5	6.8	10.8	11.6	10.5	12.5

Table 3.4.1: Schools and months of survey work

School	Survey year 1989	1990	1991	1992
11	April	May	May	April
12	April	May	April	March
13	April	May	April	May
14	May	May	April	March
15	March *	-	May	April
16	April	May	July	July
17	-	-	April	March
18	-	-	May	May
21	April	June	April	June
22	April	May	April	May
23	April	May	April	May
24	April	July	April	May
25	April	May	April	May
26	-	-	April	June/July
27	-	-	May	May

* Pilot

Table 3.4.2: Proportion (%) of people completing parents' questionnaire by survey year

	1989		1990		1991		1992	
	S	KT	S	KT	S	KT	S	KT
Father	40.4	42.4	37.1	41.6	39.8	38.0	37.0	35.1
Mother	56.2	54.8	58.9	55.8	57.3	60.2	60.4	63.0
Grandparent	0.9	0.9	1.4	0.9	1.0	0.7	0.9	0.8
Uncle/Aunt	1.7	0.7	1.7	0.5	1.2	0.6	1.2	0.7
Sibling	0.5	1.0	0.5	1.1	0.6	0.5	0.4	0.4
Guardian	0.2	0.1	0.4	0.1	0.1	0.1	0.1	0.0
Others	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0

Table 3.4.3: Percentage of missing answers to individual questions by original schools and additional schools in 1991

Variable	Original schools %	Additional schools %
Morning cough	0.1	0.1
Evening cough	0.1	0.1
Cough for 3 months	0.1	0.1
Morning phlegm	0.1	0.0
Phlegm day or night	0.1	0.1
Phelgm for 3 months	0.1	0.1
Sore throat	0.1	0.2
Nasal symptoms	0.1	0.1
Wheezing	0.3	0.3
Doctor diagnosed - asthma	0.3	0.4
- allergic rhinitis	0.1	0.1
- sinusitis	0.2	0.1
Father smokes	0.8	0.4
Mother smokes	0.5	0.7
Siblings smoke	0.4	0.3
Others smoke	1.0	0.3
Child smokes	0.7	0.6
	n=6722	n=2935
Housing type	3.7	3.7
Housing size	22.3	25.5
Father's education level	3.4	3.7
Mother's education level	4.2	3.2
	n=6510	n=2852

Table 3.4.4: Comparison of primary 3 responses by original and additional schools in 1991

	Original schools %	Additional schools %	X^2:P	
Prevalence of respiratory symptoms				
morning cough	15.2	18.5	5.87	0.015
evening cough	16.0	17.7	1.37	0.242
cough for 3 months	7.6	7.6	0.00	0.989
morning phlegm	11.8	12.9	0.68	0.408
phlegm day or night	12.5	14.2	1.73	0.188
phlegm for 3 months	7.7	7.5	0.04	0.840
sore throat	12.1	13.4	1.06	0.303
nasal symptoms	36.8	42.6	10.03	0.001
wheezing	10.6	9.2	1.37	0.242
doctor diagnosed asthma	8.3	6.2	4.71	0.030
doctor diagnosed allergic rhinitis	12.8	16.2	7.14	0.008
doctor diagnosed sinusitis	2.4	2.8	0.45	0.502
Prevalence of smoking in the home				
father smokes	32.3	31.2	0.36	0.550
mother smokes	2.3	3.9	6.71	0.010
siblings smoke	3.4	2.7	1.08	0.298
others smoke	15.3	13.1	2.78	0.095
child smokes	8.9	6.4	6.27	0.012
Demographic and socioeconomic status				
gender: boys	46.8	53.8	14.17	0.001
ageband > 12 years	0.7	0.0	14.05	0.02
housing type: public	51.1	61.6	32.18	0.001

Note df = 1 for all cases except ageband, df = 5.

Table 3.4.5: Comparison of primary 3 responses by original and additional schools for parental educational attainment in 1991

Educational attainment	Mother Original %	Mother Additional %	Father Original %	Father Additional %
None	10.4	18.7	7.3	11.6
Primary	42.7	47.5	33.5	41.1
Lower secondary	27.8	21.8	30.8	29.7
Upper secondary	16.7	11.2	22.2	14.8
Post secondary	2.4	0.8	6.2	2.8

Statistics
Between mothers: $X^2 = 69.72$, df = 1, $p<0.001$
fathers: $X^2 = 59.69$, df = 1, $p<0.001$

Table 4.1.1: Parents living with child by district and by survey year

		Mother								Father							
		Survey year								Survey year							
		1989		1990		1991		1992		1989		1990		1991		1992	
District	Living with child	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Southern	Yes	1269	94.9	1261	93.3	4271	94.5	4737	94.0	1232	95.1	1237	93.0	4141	93.5	4583	93.1
	No	68	5.1	90	6.7	247	5.5	304	6.0	63	4.9	93	7.0	289	6.5	338	6.9
Kwai Tsing	Yes	1644	94.3	1723	95.3	4142	95.0	4580	95.9	1583	94.1	1672	94.7	4026	94.2	4412	95.0
	No	99	5.7	85	4.7	219	5.0	195	4.1	99	5.9	94	5.3	250	5.8	231	5.0
Statistics	Between Districts	1989		1990		1991		1992		1989		1990		1991		1992	
	Chi-square*:	0.520		5.679		0.885		19.261		1.482		3.727		1.718		15.304	
	p-value:	0.471		0.017		0.347		<0.001		0.223		0.054		0.190		<0.001	
	Between Years	Southern		Kwai Tsing						Southern		Kwai Tsing					
	Chi-square#:	4.496		8.764						7.263		0.064					
	p-value:	0.213		0.033						4.012		0.260					

* df = 1
\# df = 3

Table 4.2.1: Parents' education by district and by survey year

District	Level of education	Mother								Father							
		Survey year								Survey year							
		1989		1990		1991		1992		1989		1990		1991		1992	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Southern	No formal education	199	14.4	204	14.6	887	19.3	930	18.2	119	8.7	135	9.8	553	12.1	572	11.3
	Primary	490	35.4	515	36.9	1773	38.6	1983	38.8	387	28.2	407	29.5	1484	32.6	1704	33.6
	Lower secondary	338	24.4	357	25.6	1057	23.0	1254	24.5	357	26.0	370	26.8	1235	27.1	1461	28.8
	Upper secondary	301	21.7	271	19.4	775	16.9	844	16.5	390	28.4	358	25.9	1011	22.2	1034	20.4
	Tertiary	58	4.2	48	3.4	103	2.2	99	1.9	119	8.7	111	8.0	272	6.0	300	5.9
Kwai Tsing	No formal education	225	12.3	231	12.4	452	10.1	426	8.7	129	7.1	137	7.4	267	6.0	247	5.1
	Primary	960	52.4	947	50.6	2307	51.7	2450	50.2	775	42.6	745	40.2	1742	39.5	1847	38.5
	Lower secondary	463	25.3	481	25.7	1217	27.3	1406	28.8	578	31.7	583	31.5	1530	34.7	1771	36.9
	Upper secondary	166	9.1	194	10.4	455	10.2	555	11.4	279	15.3	329	17.8	760	17.2	810	16.9
	Tertiary	17	0.9	17	0.9	34	0.8	42	0.9	60	3.3	58	3.1	115	2.6	126	2.6
Total		3217		3265		9060		9989		3193		3233		8969		9872	
Statistics	Between Districts	1989		1990		1991		1992		1989		1990		1991		1992	
	Chi-square*:	176.711		108.399		338.675		322.784		160.087		98.101		248.970		255.548	
	p-value:	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
	Between Years	Southern		Kwai Tsing						Southern		Kwai Tsing					
	Chi-square#:	81.242		45.059						90.275		45.035					
	p-value:	<0.001		<0.001						<0.001		<0.001					
	* df = 4																
	# df = 12																

Table 4.3.1: Parents currently employed by district and by survey year

District	Currently employed	Mother								Father							
		Survey year								Survey year							
		1989		1990		1991		1992		1989		1990		1991		1992	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Southern	Yes	440	40.7	521	39.8	1793	45.8	2063	47.0	1139	96.0	1238	96.8	3938	95.3	4362	94.9
	No	640	59.3	789	60.2	2123	54.2	2328	53.0	48	4.0	41	3.2	196	4.7	234	5.1
Kwai Tsing	Yes	519	37.8	650	37.1	1678	45.6	1759	43.9	1399	94.1	1671	97.3	3689	93.7	3996	93.5
	No	855	62.2	1101	62.9	2005	54.4	2252	66.1	88	5.9	47	2.7	247	6.3	277	6.5
Statistics	Between Districts	1989		1990		1991		1992		1989		1990		1991		1992	
	Chi-square*.	2.237		2.227		0.039		8.272		4.803		0.568		9.148		7.893	
	p-value:	0.135		0.136		0.843		0.004		0.028		0.451		0.002		0.005	
	Between Years	Southern		Kwai Tsing						Southern		Kwai Tsing					
	Chi-square#:	30.332		50.373						9.124		34.970					
	p-value:	<0.001		<0.001						0.028		<0.001					
	* df = 1																
	# df = 3																

Table 4.3.2: Occupation of parents by district and by survey year

District	Occupation	Mother				Father			
		Survey year				Survey year			
		1991		1992		1991		1992	
		n	%	n	%	n	%	n	%
Southern	None/housewife	2774	62.8	3028	61.3	155	3.5	137	2.8
	Professional	102	2.3	119	2.4	276	6.3	271	5.5
	Clerical	393	8.9	429	8.7	434	9.8	450	9.2
	Sales	199	4.5	249	5.0	467	10.6	534	10.9
	Services	140	3.2	177	3.6	396	9.0	470	9.6
	Manufacturing	216	4.9	240	4.9	1250	28.4	1398	28.4
	Others	595	13.5	696	14.1	1429	33.4	1657	33.7
Kwai Tsing	None/housewife	2705	62.8	3032	64.4	141	3.3	184	4.0
	Professional	20	0.5	26	0.6	103	2.4	94	2.0
	Clerical	167	3.9	221	4.7	208	4.9	235	5.1
	Sales	194	4.5	190	4.0	451	10.6	475	10.3
	Services	82	1.9	101	2.1	280	6.6	329	7.1
	Manufacturing	662	15.4	667	14.2	1948	45.8	2110	45.7
	Others	475	11.0	468	9.9	1125	26.4	1194	25.8

Statistics		Mother			Father		
	Between Districts	1989	1991	1992	1989	1991	1992
	Chi-square*:	237.474	401.000	168.507	213.423	365.383	189.275
	p-value:	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Between Years	Southern	Kwai Tsing		Southern	Kwai Tsing	
	Chi-square#:	474.197	1194.654		1988.283	3514.953	
	p-value:	<0.001	<0.001		<0.001	<0.001	

* df = 6
# df = 12

Table 4.4.1: Living quarter types by district and by survey year

District	Housing type	Survey year 1989 n	%	1990 n	%	1991 n	%	1992 n	%
Southern	Public	743	52.0	736	52.1	2425	52.8	2695	52.5
	Private - self contained	528	37.0	507	35.9	1558	33.9	1721	33.6
	Private - shared	49	3.4	32	2.3	128	2.8	146	2.8
	Home ownership	29	2.0	24	1.7	205	4.5	199	3.9
	Temporary	12	0.8	44	3.1	130	2.8	143	2.8
	Other (village)	67	4.7	70	5.0	145	3.2	225	4.4
Kwai Tsing	Public	1362	72.1	1346	70.9	3164	70.8	3366	69.1
	Private - self contained	412	21.8	405	21.3	932	20.9	1059	21.7
	Private - shared	36	1.9	55	2.9	77	1.7	88	1.8
	Home ownership	31	1.6	43	2.3	62	1.4	59	1.2
	Temporary	31	1.6	28	1.5	98	2.2	102	2.1
	Other (village)	18	1.0	21	1.1	136	3.0	195	4.0
Total		3318		3311		9060		9998	

Statistics	Between Districts	1989	1990	1991	1992
	Chi-square*:	174.082	164.015	347.569	324.734
	p-value:	<0.000	<0.000	<0.000	<0.000
	Between Years	Southern	Kwai Tsing		
	Chi-square#:	77.583	97.453		
	p-value:	<0.000	<0.000		
	* df = 5				
	# df = 15				

Table 4.4.2: Size of living quarters, occupancy rate and time lived there by district and by survey year

		Survey year											
		1989			1990			1991			1992		
District	Living quarters statistics	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n
Southern	Size (sq ft)	467.6	295.0	1504	474.2	275.0	1486	4342	276.0	4993	436.8	286.0	5605
	No. of people	4.54	2.8	1504	4.45	2.5	1486	4.48	2.37	4993	5.66	7.1	5605
	Area per person	127.4	94.9	1504	130.3	100.3	1486	115.8	83.4	1993	114.8	91.5	5605
	Stay (weeks)	327.4	138.7	1504	371.4	172.0	1486	322.8	185.0	4993	345.7	178.0	5605
Kwai Tsing	Size (sq ft)	355.7	183	2017	373.2	172	2027	356.7	210	4785	361.8	237	5137
	No. of people	4.72	3.0	2017	4.49	2.3	2027	4.35	2.12	4785	5.05	5.5	5137
	Area per person	91.1	62.4	2017	96.2	58.6	2027	94.7	65.8	4785	95.5	73.4	5137
	Stay (weeks)	321.9	142.4	2017	357.9	172.2	2027	306.9	179.1	4785	348.7	174.0	5137

		1989		1990		1991		1992	
Statistics	Between Districts	t value	p	t value	p	t value	p	t value	p
	Size (sq ft)	11.97	<0.001	11.63	<0.001	13.34	<0.001	12.97	<0.001
	No. of people	-1.76	0.079	-0.42	0.677	2.85	0.004	4.77	<0.001
	Area per person	11.66	<0.001	10.94	<0.001	11.72	<0.001	10.48	<0.001
	Stay (weeks)	1.06	0.289	2.17	0.30	3.91	<0.001	-0.59	0.553

Table 4.5.1: Type of fuel used for cooking and heating by district and by survey year

		Survey year							
		1989		1990		1991		1992	
District	Fuel used	n	%	n	%	n	%	n	%
Southern	Town gas	597	39.7	614	41.3	2398	48.0	2817	50.3
	LP gas	826	54.9	785	52.8	2263	45.3	2358	42.1
	Kerosene	100	6.6	63	4.2	242	4.8	219	3.9
	Firewood	3	0.2	2	0.1	11	0.2	11	0.2
	Electricity	104	6.9	86	5.8	264	5.3	377	6.7
Kwai Tsing	Town gas	962	47.7	1079	53.2	2825	59.0	3236	63.0
	LP gas	840	41.6	726	35.8	1543	32.2	1572	30.6
	Kerosene	449	22.3	354	17.5	711	14.9	706	13.7
	Firewood	6	0.3	4	0.2	11	0.2	15	0.3
	Electricity	102	5.1	76	3.7	212	4.4	280	5.5

Note: Percentages do not add up to 100%, as more than one type of fuel is used in many households: Each type of fuel is treated exclusively: LP = liquid petroleum: statistics cannot be performed for between-districts comparison of firewood or electricity as numbers are too small.

Statistics

	1989			1990			1991			1992		
Between Districts	Town gas	LP gas	Kerosene	Town gas	LP gas	Kerosene	Town gas	LP gas	Kerosene	Town gas	LP gas	Kerosene
Chi-square*:	22.351	60.900	159.554	48.733	101.21	143.345	119.062	175.756	278.446	176.740	151.944	329.538
p-value:	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

* df = 1

Table 4.5.2: Use of incense and mosquito coils in the home by district and by survey year

District	Aromatics	Survey year							
		1989		1990		1991		1992	
		n	%	n	%	n	%	n	%
Southern	Incense	784	56.0	747	54.8	2565	57.4	2767	55.8
	Mosquito coils	335	25.1	372	27.7	1096	25.8	1227	26.1
Kwai Tsing	Incense	1065	57.8	1089	60.3	2384	55.6	2565	55.0
	Mosquito coils	320	18.4	371	20.8	913	22.5	953	21.6
Statistics		1989		1990		1991		1992	
	Between Districts	Incense	Mosquito coils	Incense	Mosquito coils	Incense	Mosquito coils	Incense	Mosquito coils
	Chi-square*:	1.158	19.952	9.503	20.203	2.677	12.382	0.605	24.966
	p-value:	0.282	<0.001	0.002	<0.001	0.102	<0.001	0.437	<0.001
	Between Years	Incense	Mosquito coils	Incense	Mosquito coils				
	Chi-square#:	3.796	2.631	17.156	12.541				
	p-value:	0.284	0.452	<0.001	0.006				

* df = 1
\# df = 3

Table 4.6.1: Subjective assessment of air quality as good by parents and children, by district and by survey year

		Parents								Children							
		Survey year								Survey year							
		1989		1990		1991		1992		1989		1990		1991		1992	
District	Venue	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Southern	Indoors	1271	89.3	1225	88.6	3897	85.9	4288	84.8	1332	89.3	1333	90.3	4188	84.9	4806	86.9
	Outdoors	1217	85.3	1171	84.8	3680	81.2	3997	79.2								
	School	1364	96.1	1308	95.0	4033	89.3	4464	88.8	1368	91.8	1271	86.1	4254	86.3	4695	84.9
	District	1220	87.0	1173	85.8	3677	81.9	4065	81.4								
	Play area	1138	82.2	1111	82.1	3375	76.0	3719	75.1								
Kwai Tsing	Indoors	1254	66.9	1200	65.2	2834	65.1	3173	66.9	1367	68.1	1252	62.7	3156	67.0	3479	68.8
	Outdoors	1072	57.3	976	53.2	2275	52.2	2627	55.5								
	School	1274	68.9	1058	58.3	2432	56.6	2740	58.7	1237	61.6	1038	52.2	2835	60.2	2940	58.1
	District	1004	54.5	884	48.8	2052	47.8	2385	51.4								
	Play area	1148	64.2	1061	60.7	2437	58.0	2686	58.8								
Statistics																	
Between Districts		1989		1990		1991		1992		1989		1990		1991		1992	
Indoors:	Chi-square*:	225.037		231.859		521.142		432.018		219.256		339.489		422.896		506.359	
	p-value:	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Outdoors:	Chi-square*:	299.924		355.325		842.617		626.411		-		-		-		-	
	p-value:	<0.001		<0.001		<0.001		<0.001									
School:	Chi-square*:	379.436		550.492		1207.644		1152.891		409.856		437.774		839.079		939.765	
	p-value:	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
District:	Chi-square*:	388.907		467.650		1127.168		979.536		-		-		-		-	
	p-value:	<0.001		<0.001		<0.001		<0.001									
Play area:	Chi-square*:	125.840		166.701		318.461		285.187		-		-		-		-	
	p-value:	<0.001		<0.001		<0.001		<0.001									

Between Years					
Indoors:	Chi-square#:	25.836	4.658	39.838	24.727
	p-value:	<0.001	0.199	<0.001	<0.001
Outdoors:	Chi-square#:	41.276	18.217	-	-
	p-value:	<0.001	<0.001		
School:	Chi-square#:	107.306	85.900	47.691	47.048
	p-value:	<0.001	<0.001	<0.001	<0.001
District:	Chi-square#:	34.530	27.724	-	
	p-value:	<0.001	<0.001		
Play area:	Chi-square#:	54.507	22.556	-	-
	p-value:	<0.001	<0.001		

* df = 1
\# df = 3

Table 5.1.1: Parents' smoking behaviour by district and by survey year

District	Smoking status	Mother								Father							
		Survey year								Survey year							
		1989		1990		1991		1992		1989		1990		1991		1992	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Southern	Yes	56	3.8	46	3.1	167	3.4	213	3.8	513	34.4	486	32.9	1477	29.9	1821	32.5
	Used/not now	21	1.4	29	2.0	97	2.0	173	3.1	168	11.3	191	12.9	766	15.5	793	14.2
	Never	1414	94.8	1402	94.9	4668	94.6	5206	93.1	812	54.4	800	54.2	2691	54.5	2981	53.3
Kwai Tsing	Yes	57	2.8	59	2.9	119	2.5	155	3.0	834	41.5	833	41.7	1675	35.6	2000	39.0
	Used/not now	54	2.7	40	2.0	139	3.0	170	3.3	347	17.3	353	17.7	1037	22.0	987	19.2
	Never	1899	94.5	1902	95.1	4452	94.5	4805	93.7	829	41.2	814	40.7	1995	42.4	2141	41.7
Total		3501		3478		9642		10722		3503		3477		9641		10724	
Statistics	Between Districts	1989		1990		1991		1992		1989		1990		1991		1992	
	Chi-square*:	8.784		0.084		15.543		5.333		63.979		62.396		151.285		148.319	
	p-value:	0.012		0.959		<0.001		0.070		<0.001		<0.001		<0.001		<0.001	
	Between Years	Southern		Kwai Tsing						Southern		Kwai Tsing					
	Chi-square#:	25.879		11.624						27.756		47.153					
	p-value:	<0.001		0.071						<0.001		<0.001					
	* df = 2																
	# df = 8																

Table 5.1.2: Siblings' and others' smoking behaviour by district and by survey year

District	Smoking status	Siblings								Others							
		Survey year								Survey year							
		1989		1990		1991		1992		1989		1990		1991		1992	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Southern	Yes	69	4.6	82	5.6	236	4.8	303	5.5	188	12.6	181	12.3	668	13.6	858	15.6
	No	1283	86.0	1273	86.4	4350	88.3	4880	88.4	707	47.4	734	49.9	2860	58.1	3214	58.5
	Not live with	140	9.4	118	8.0	338	6.9	340	6.2	595	39.9	556	37.8	1391	28.3	1421	25.9
Kwai Tsing	Yes	118	5.9	147	7.4	280	6.0	316	6.3	278	13.9	252	12.7	547	11.7	737	14.7
	No	1761	88.1	1749	87.5	4076	86.8	4466	88.5	986	49.4	966	48.5	2492	53.5	2836	56.7
	Not live with	120	6.0	104	5.2	339	7.2	267	5.3	733	36.7	772	38.8	1622	34.8	1427	28.5
	Total	3491		3473		9619		10572		3487		3461		9580		10493	
Statistics	Between Districts	1989		1990		1991		1992		1989		1990		1991		1992	
	Chi-square*:	16.147		14.678		7.216		6.152		4.070		0.622		48.151		9.668	
	p-value:	<0.001		<0.001		0.027		0.046		0.131		0.733		<0.001		0.008	
	Between Years	Southern		Kwai Tsing						Southern		Kwai Tsing					
	Chi-square#:	25.015		23.551						170.455		104.778					
	p-value:	<0.001		<0.001						<0.001		<0.001					

* df = 2
\# df = 8

Table 5.1.3: Children's smoking behaviour and number of smokers in the family by district and by survey year

District	Smoking status	Children								Number of smokers in family								
		Survey year									Survey year							
		1989		1990		1991		1992			1989		1990		1991		1992	
		n	%	n	%	n	%	n	%		n	%	n	%	n	%	n	%
Southern	Never smoked	1390	93.4	1326	89.8	4435	90.2	4988	90.1	0	855	56.8	861	57.9	3000	60.1	3143	56.1
	Tried few times	85	5.7	127	8.6	406	8.3	419	7.6	1	492	32.7	475	32.0	1510	30.2	1843	32.9
	Not now	7	0.5	11	0.7	32	0.7	49	0.9	2 or more	157	10.4	150	10.1	483	9.7	619	11.0
	Smoke < 1/wk	5	0.3	11	0.7	27	0.5	45	0.8									
	Smoke 1-6 cig/wk	0	0.0	2	0.1	11	0.2	23	0.4									
	Smoke >6 cig/wk	1	0.1	0	0.0	8	0.2	12	0.2									
Kwai Tsing	Never smoked	1823	90.8	1715	85.8	4095	87.5	4486	88.7	0	1005	49.8	1008	49.7	2661	55.6	2587	50.4
	Tried few times	146	7.3	227	11.4	481	10.3	460	9.1	1	768	38.1	778	38.4	1673	35.0	1959	38.1
	Not now	17	0.8	22	1.1	49	1.0	57	1.1	2 or more	244	12.1	241	11.9	451	9.4	591	11.5
	Smoke < 1/wk	13	0.6	17	0.9	35	0.7	38	0.8									
	Smoke 1-6 cig/wk	5	0.2	10	0.5	13	0.3	13	0.3									
	Smoke >6 cig/wk	3	0.1	8	0.4	6	0.1	4	0.1									
Total		3495		3476		9598		10594			3521		3513		9779		10742	
Statistics	Between Districts	1989		1990		1991		1992			1989		1990		1991		1992	
	Chi-square*:	11.364		18.318		18.957		14.947			17.048		23.250		25.331		37.820	
	p-value:	0.045		0.003		0.002		0.011			<0.001		<0.001		<0.001		<0.001	
	Between Years	Southern		Kwai Tsing							Southern		Kwai Tsing					
	Chi-square#:	36.037		39.567							18.884		42.975					
	p-value:	0.002		<0.001							0.005		<0.001					
	* df = 5										df* = 2							
	# df = 15										df# = 6							

Table 6.1.1: Sample sizes for Tables 6.1.2 to 6.1.13 by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	278	1	323	292	21	3	290	12	253	285
	4	257	269	303	311		4	293	280	266	272
	5		258	275	296		5		275	269	267
	6			231	265		6			264	256
12	3	30		56	35	22	3	105	1	61	37
	4	38	30	43	59		4	91	105	74	68
	5		40	60	44		5		101	102	80
	6			73	58		6			98	103
13	3	106		79	86	23	3	78		42	35
	4	135	110	109	90		4	102	82	54	42
	5		125	104	116		5		118	80	58
	6			134	112		6			116	77
14	3	30		51	34	24	3	141		126	124
	4	38	33	40	62		4	198	152	152	130
	5		39	39	60		5		203	157	151
	6			40	39		6			190	154
15	3			330	337	25	3	343	6	383	382
	4			334	340		4	376	335	341	374
	5			173	343		5		357	321	327
	6			166	171		6			348	318
16	3	304	9	297	314	26	3			225	203
	4	288	297	305	313		4			243	223
	5		275	297	300		5				223
	6			260	296						
17	3			161	158	27	3			320	322
	4			160	153		4			300	322
	5				156		5				304
18	3			242	241						
	4			308	223						
	5				301						

Table 6.1.2: Prevalence of morning cough by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	0.083		0.173	0.209	21	3	0.141		0.194	0.200
	4	0.070	0.048	0.086	0.122		4	0.085	0.089	0.143	0.114
	5		0.070	0.062	0.084		5		0.055	0.059	0.075
	6			0.039	0.053		6			0.042	0.066
12	3	0.067		0.143	0.343	22	3	0.086		0.115	0.135
	4	0.026	0.133	0.140	0.254		4	0.077	0.105	0.041	0.132
	5		0.100	0.117	0.227		5		0.040	0.010	0.138
	6			0.014	0.172		6			0.041	0.097
13	3	0.151		0.139	0.302	23	3	0.090		0.167	0.114
	4	0.081	0.136	0.073	0.089		4	0.108	0.110	0.148	0.190
	5		0.048	0.048	0.112		5		0.051	0.025	0.052
	6			0.007	0.098		6			0.026	0.026
14	3	0.267		0.137	0.059	24	3	0.213		0.198	0.202
	4	0.079	0.061	0.100	0.161		4	0.066	0.092	0.171	0.169
	5		0.077	0.077	0.067		5		0.074	0.083	0.159
	6			0.075	0.026		6			0.047	0.071
15	3			0.212	0.226	25	3	0.093		0.133	0.217
	4			0.165	0.109		4	0.077	0.078	0.106	0.155
	5			0.075	0.122		5		0.062	0.069	0.092
	6			0.078	0.094		6			0.023	0.063
16	3	0.066		0.101	0.159	26	3			0.173	0.261
	4	0.076	0.071	0.108	0.089		4			0.123	0.152
	5		0.069	0.054	0.073		5				0.108
	6			0.050	0.051						
17	3			0.112	0.222	27	3			0.175	0.152
	4			0.119	0.105		4			0.117	0.130
	5				0.071		5				0.089
18	3			0.215	0.241						
	4			0.117	0.121						
	5				0.093						

Table 6.1.3: Prevalence of cough in evening by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	0.079		0.192	0.223	21	3	0.152		0.190	0.175
	4	0.078	0.063	0.083	0.141		4	0.109	0.082	0.117	0.114
	5		0.058	0.055	0.081		5		0.051	0.059	0.075
	6			0.030	0.042		6			0.023	0.063
12	3	0.033		0.286	0.371	22	3	0.105		0.115	0.162
	4	0.053		0.256	0.254		4	0.055	0.057	0.108	0.147
	5		0.100	0.100	0.205		5		0.040	0.010	0.063
	6			0.000	0.121		6			0.041	0.039
13	3	0.151		0.215	0.302	23	3	0.090		0.167	0.114
	4	0.067	0.100	0.083	0.078		4	0.069	0.110	0.130	0.190
	5		0.056	0.048	0.095		5		0.051	0.050	0.069
	6			0.022	0.054		6			0.017	0.026
14	3	0.133		0.176	0.176	24	3	0.135		0.198	0.194
	4	0.053	0.091	0.100	0.177		4	0.086	0.053	0.145	0.154
	5		0.051	0.000	0.067		5		0.079	0.096	0.119
	6			0.075	0.051		6			0.032	0.097
15	3			0.182	0.217	25	3	0.102		0.115	0.199
	4			0.168	0.109		4	0.088	0.093	0.097	0.155
	5			0.075	0.117		5		0.056	0.069	0.095
	6			0.054	0.064		6			0.032	0.053
16	3	0.066		0.101	0.175	26	3			0.120	0.227
	4	0.087	0.051	0.105	0.083		4			0.091	0.112
	5		0.051	0.054	0.083		5				0.081
	6			0.031	0.030						
17	3			0.130	0.228	27	3			0.213	0.180
	4			0.081	0.111		4			0.117	0.134
	5				0.077		5				0.066
18	3			0.198	0.191						
	4			0.110	0.126						
	5				0.080						

Table 6.1.4: Prevalence of cough for 3 months by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	0.025		0.090	0.072	21	3	0.041		0.087	0.116
	4	0.016	0.026	0.046	0.058		4	0.044	0.036	0.056	0.063
	5		0.031	0.029	0.044		5		0.029	0.022	0.045
	6			0.017	0.030		6			0.015	0.035
12	3	0.033		0.018	0.143	22	3	0.048		0.066	0.054
	4		0.000	0.047	0.017		4	0.011	0.048	0.027	0.103
	5		0.000	0.067	0.045		5		0.020	0.020	0.088
	6			0.000	0.000		6			0.031	0.049
13	3	0.028		0.089	0.151	23	3	0.026		0.071	0.057
	4		0.055	0.018	0.111		4	0.020	0.012	0.093	0.024
	5		0.008	0.029	0.017		5		0.017	0.013	0.052
	6			0.007	0.027		6			0.009	0.039
14	3	0.033		0.078	0.029	24	3	0.064		0.103	0.129
	4	0.026	0.030	0.025	0.081		4	0.040	0.020	0.046	0.046
	5		0.077	0.051	0.050		5		0.054	0.019	0.079
	6			0.025	0.051		6			0.026	0.026
15	3			0.076	0.101	25	3	0.050		0.047	0.099
	4			0.060	0.032		4	0.035	0.033	0.044	0.075
	5			0.035	0.038		5		0.028	0.022	0.058
	6			0.018	0.018		6			0.009	0.025
16	3	0.033		0.081	0.118	26	3			0.071	0.089
	4	0.035	0.017	0.043	0.061		4			0.037	0.090
	5		0.015	0.034	0.043		5				0.049
	6			0.008	0.027						
17	3			0.043	0.057	27	3			0.103	0.124
	4			0.025	0.059		4			0.037	0.068
	5				0.038		5				0.030
18	3			0.062	0.120						
	4			0.052	0.013						
	5				0.037						

Table 6.1.5: Prevalence of phlegm in the morning by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	0.104		0.133	0.106	21	3	0.155		0.134	0.137
	4	0.078	0.059	0.046	0.122		4	0.188	0.118	0.083	0.066
	5		0.081	0.069	0.051		5		0.080	0.071	0.071
	6			0.035	0.053		6			0.064	0.113
12	3	0.133		0.143	0.200	22	3	0.124		0.098	0.162
	4		0.200	0.140	0.136		4	0.176	0.105	0.068	0.088
	5		0.050	0.067	0.159		5		0.050	0.029	0.113
	6			0.096	0.241		6			0.051	0.107
13	3	0.142		0.063	0.140	23	3	0.090		0.119	0.086
	4	0.111	0.091	0.073	0.078		4	0.078	0.073	0.074	0.095
	5		0.080	0.077	0.121		5		0.085	0.013	0.121
	6			0.030	0.054		6			0.052	0.026
14	3	0.200		0.118	0.118	24	3	0.170		0.127	0.153
	4	0.158	0.091	0.175	0.081		4	0.091	0.066	0.151	0.115
	5		0.077	0.128	0.100		5		0.079	0.083	0.113
	6			0.100	0.128		6			0.063	0.104
15	3			0.148	0.136	25	3	0.114		0.094	0.173
	4			0.093	0.115		4	0.120	0.087	0.111	0.142
	5			0.040	0.082		5		0.115	0.056	0.089
	6			0.072	0.082		6			0.043	0.063
16	3	0.122		0.125	0.131	26	3			0.138	0.192
	4	0.104	0.111	0.082	0.083		4			0.086	0.117
	5		0.113	0.074	0.067		5				0.117
	6			0.077	0.084						
17	3			0.062	0.165	27	3			0.138	0.137
	4			0.075	0.072		4			0.087	0.140
	5				0.115		5				0.059
18	3			0.124	0.104						
	4			0.107	0.103						
	5				0.086						

Table 6.1.6: Prevalence of phlegm day or night by school, by primary grade, by district and by survey year

School	Primary grade	Southern				School	Primary grade	Kwai Tsing			
		Survey year						Survey year			
		1989	1990	1991	1992			1989	1990	1991	1992
11	3	0.094		0.146	0.113	21	3	0.110		0.146	0.147
	4	0.109	0.097	0.050	0.125		4	0.154	0.107	0.109	0.055
	5		0.050	0.069	0.054		5		0.055	0.063	0.064
	6			0.026	0.064		6			0.045	0.070
12	3	0.067		0.107	0.200	22	3	0.114		0.098	0.189
	4	0.053	0.133	0.047	0.085		4	0.110	0.114	0.041	0.044
	5		0.025	0.083	0.045		5		0.069	0.029	0.125
	6			0.014	0.190		6			0.061	0.097
13	3	0.151		0.101	0.279	23	3	0.051		0.095	0.114
	4	0.052	0.091	0.083	0.056		4	0.020	0.085	0.093	0.119
	5		0.080	0.067	0.052		5		0.059	0.025	0.086
	6			0.022	0.027		6			0.026	0.026
14	3	0.233		0.176	0.088	24	3	0.191		0.167	0.121
	4	0.105	0.091	0.100	0.113		4	0.101	0.059	0.086	0.115
	5		0.051	0.026	0.117		5		0.089	0.064	0.099
	6			0.100	0.128		6			0.042	0.045
15	3			0.158	0.172	25	3	0.076		0.094	0.157
	4			0.120	0.097		4	0.093	0.093	0.070	0.094
	5			0.040	0.090		5		0.059	0.053	0.073
	6			0.060	0.053		6			0.032	0.044
16	3	0.125		0.111	0.099	26	3			0.142	0.187
	4	0.111	0.067	0.085	0.073		4			0.082	0.117
	5		0.080	0.027	0.077		5				0.063
	6			0.069	0.071						
17	3			0.106	0.234	27	3			0.131	0.180
	4			0.094	0.072		4			0.113	0.106
	5				0.045		5				0.053
18	3			0.153	0.149						
	4			0.097	0.072						
	5				0.050						

Table 6.1.7: Prevalence of phlegm for 3 months by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	0.025		0.090	0.086	21	3	0.072		0.071	0.095
	4	0.039	0.030	0.033	0.064		4	0.055	0.064	0.056	0.077
	5		0.047	0.047	0.037		5		0.044	0.011	0.041
	6			0.026	0.049		6			0.034	0.063
12	3	0.000		0.054	0.086	22	3	0.048		0.082	0.108
	4	0.026	0.000	0.047	0.085		4	0.044	0.057	0.054	0.059
	5		0.000	0.067	0.091		5		0.069	0.020	0.050
	6			0.027	0.017		6			0.061	0.029
13	3	0.028		0.063	0.163	23	3	0.038		0.095	0.171
	4	0.022	0.064	0.046	0.067		4	0.039	0.012	0.093	0.071
	5		0.008	0.038	0.069		5		0.051	0.025	0.138
	6			0.022	0.009		6			0.009	0.065
14	3	0.167		0.098	0.088	24	3	0.071		0.127	0.105
	4	0.053	0.030	0.100	0.081		4	0.035	0.033	0.105	0.085
	5		0.026	0.051	0.017		5		0.059	0.070	0.079
	6			0.000	0.103		6			0.026	0.071
15	3			0.079	0.119	25	3	0.044		0.052	0.113
	4			0.066	0.074		4	0.048	0.039	0.047	0.070
	5			0.029	0.067		5		0.028	0.028	0.070
	6			0.060	0.041		6			0.017	0.053
16	3	0.026		0.074	0.118	26	3			0.053	0.148
	4	0.049	0.047	0.052	0.083		4			0.053	0.085
	5		0.040	0.037	0.040		5				0.031
	6			0.042	0.054						
17	3			0.043	0.070	27	3			0.084	0.137
	4			0.044	0.039		4			0.047	0.071
	5				0.071		5				0.053
18	3			0.099	0.116						
	4			0.049	0.049						
	5				0.090						

Table 6.1.8: Prevalence of sore throat by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	0.058		0.149	0.195	21	3	0.076		0.174	0.175
	4	0.043	0.033	0.125	0.103		4	0.106	0.100	0.098	0.162
	5		0.054	0.087	0.115		5		0.124	0.052	0.094
	6			0.065	0.091		6			0.045	0.121
12	3			0.089	0.200	22	3	0.133		0.148	0.189
	4		0.133	0.116	0.085		4	0.011	0.105	0.041	0.118
	5		0.075	0.017	0.318		5		0.050	0.039	0.200
	6			0.014	0.155		6			0.061	0.165
13	3	0.075		0.038	0.314	23	3	0.090		0.048	0.114
	4	0.074	0.055	0.073	0.122		4	0.059	0.098	0.111	0.143
	5		0.032	0.048	0.147		5		0.076	0.038	0.155
	6			0.060	0.071		6			0.069	0.143
14	3	0.100		0.059	0.059	24	3	0.050		0.159	0.177
	4	0.000	0.061	0.075	0.177		4	0.106	0.118	0.178	0.246
	5		0.077	0.128	0.067		5		0.138	0.057	0.245
	6			0.050	0.179		6			0.074	0.182
15	3			0.136	0.205	25	3	0.090		0.078	0.230
	4			0.120	0.132		4	0.088	0.099	0.103	0.171
	5			0.133	0.102		5		0.064	0.072	0.156
	6			0.066	0.094		6			0.049	0.113
16	3	0.059		0.125	0.217	26	3			0.142	0.315
	4	0.049	0.094	0.125	0.144		4			0.144	0.175
	5		0.065	0.077	0.123		5				0.135
	6			0.046	0.084						
17	3			0.099	0.304	27	3			0.144	0.227
	4			0.100	0.144		4			0.130	0.174
	5				0.160		5				0.145
18	3			0.128	0.237						
	4			0.084	0.126						
	5				0.186						

Table 6.1.9: Prevalence of nasal symptoms by school, by primary grade, by district and by survey year

School	Primary grade	Southern				School	Primary grade	Kwai Tsing			
		Survey year						Survey year			
		1989	1990	1991	1992			1989	1990	1991	1992
11	3	0.270		0.467	0.349	21	3	0.362		0.403	0.404
	4	0.268	0.249	0.406	0.408		4	0.355	0.261	0.402	0.404
	5		0.248	0.316	0.358		5		0.247	0.283	0.356
	6			0.216	0.325		6			0.277	0.348
12	3	0.333		0.250	0.429	22	3	0.267		0.344	0.514
	4	0.368	0.167	0.326	0.441		4	0.297	0.257	0.324	0.338
	5		0.125	0.183	0.500		5		0.218	0.186	0.375
	6			0.260	0.293		6			0.204	0.350
13	3	0.302		0.266	0.500	23	3	0.205		0.262	0.400
	4	0.200	0.273	0.284	0.278		4	0.284	0.256	0.296	0.429
	5		0.200	0.212	0.388		5		0.212	0.225	0.259
	6			0.142	0.223		6			0.241	0.299
14	3	0.333		0.392	0.412	24	3	0.404		0.365	0.476
	4	0.368	0.182	0.325	0.419		4	0.369	0.217	0.388	0.554
	5		0.179	0.231	0.367		5		0.222	0.293	0.576
	6			0.175	0.410		6			0.289	0.403
15	3			0.470	0.496	25	3	0.327		0.355	0.479
	4			0.506	0.409		4	0.322	0.301	0.375	0.457
	5			0.428	0.399		5		0.266	0.293	0.437
	6			0.404	0.392		6			0.201	0.346
16	3	0.283		0.290	0.449	26	3			0.378	0.502
	4	0.333	0.266	0.387	0.332		4			0.354	0.439
	5		0.240	0.296	0.357		5				0.359
	6			0.242	0.260						
17	3			0.304	0.551	27	3			0.431	0.481
	4			0.431	0.320		4			0.437	0.441
	5				0.423		5				0.391
18	3			0.467	0.510						
	4			0.432	0.359						
	5				0.415						

Table 6.1.10: Prevalence of wheezing by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	0.094		0.180	0.096	21	3	0.055		0.107	0.119
	4	0.105	0.126	0.112	0.122		4	0.099	0.079	0.105	0.110
	5		0.120	0.098	0.105		5		0.113	0.052	0.112
	6			0.104	0.125		6			0.080	0.066
12	3	0.100		0.018		22	3	0.114		0.082	0.027
	4	0.053	0.100	0.047	0.085		4	0.066	0.076	0.135	0.088
	5		0.075	0.033	0.068		5		0.139	0.059	0.138
	6			0.027	0.034		6			0.102	0.049
13	3	0.047		0.025	0.163	23	3	0.026		0.143	0.086
	4	0.052	0.027	0.092	0.056		4	0.088	0.037	0.167	0.119
	5		0.048	0.029	0.069		5		0.051	0.013	0.086
	6			0.037	0.027		6			0.017	0.039
14	3	0.133		0.118	0.088	24	3	0.163		0.048	0.121
	4	0.105	0.000	0.175	0.210		4	0.131	0.072	0.092	0.092
	5		0.077	0.051	0.067		5		0.133	0.096	0.179
	6			0.075	0.077		6			0.063	0.084
15	3			0.100	0.113	25	3	0.137		0.120	0.160
	4			0.111	0.091		4	0.117	0.125	0.126	0.142
	5			0.058	0.111		5		0.104	0.093	0.116
	6			0.078	0.053		6			0.078	0.119
16	3	0.069		0.057	0.080	26	3			0.102	0.113
	4	0.063	0.111	0.102	0.064		4			0.099	0.126
	5		0.080	0.094	0.080		5				0.094
	6			0.038	0.074						
17	3			0.075	0.095	27	3			0.103	0.171
	4			0.044	0.098		4			0.077	0.121
	5				0.064		5				0.105
18	3			0.066	0.116						
	4			0.071	0.076						
	5				0.063						

Table 6.1.11: Prevalence of doctor diagnosed asthma by school, by primary grade, by district and by survey year

School	Primary grade	Southern 1989	Southern 1990	Southern 1991	Southern 1992	School	Primary grade	Kwai Tsing 1989	Kwai Tsing 1990	Kwai Tsing 1991	Kwai Tsing 1992
11	3	0.115		0.108	0.086	21	3	0.059		0.071	0.084
	4	0.089	0.100	0.092	0.129		4	0.072	0.057	0.068	0.081
	5		0.089	0.087	0.098		5		0.065	0.052	0.060
	6			0.087	0.109		6			0.064	0.055
12	3	0.100		0.036	0.057	22	3	0.057		0.033	0.000
	4	0.026	0.067	0.000	0.034		4	0.044	0.038	0.054	0.059
	5		0.025	0.017	0.000		5		0.079	0.039	0.050
	6			0.014	0.017		6			0.092	0.058
13	3	0.047		0.063	0.070	23	3	0.026		0.071	0.029
	4	0.030	0.018	0.037	0.056		4	0.029	0.024	0.037	0.119
	5		0.048	0.019	0.060		5		0.034	0.013	0.034
	6			0.045	0.036		6			0.026	0.013
14	3	0.067		0.118	0.059	24	3	0.092		0.032	0.056
	4	0.053	0.000	0.075	0.129		4	0.091	0.072	0.066	0.062
	5		0.051	0.075	0.017		5		0.099	0.057	0.093
	6			0.000	0.026		6			0.084	0.084
15	3			0.091	0.077	25	3	0.085		0.091	0.092
	4			0.090	0.068		4	0.080	0.093	0.085	0.115
	5			0.052	0.090		5		0.070	0.075	0.092
	6			0.066	0.053		6			0.066	0.091
16	3	0.059		0.091	0.045	26	3			0.058	0.064
	4	0.073	0.057	0.092	0.086		4			0.066	0.090
	5		0.076	0.067	0.090		5				0.085
	6			0.062	0.061						
17	3			0.056	0.057	27	3			0.053	0.084
	4			0.063	0.039		4			0.040	0.062
	5				0.096		5				0.053
18	3			0.041	0.083						
	4			0.058	0.058						
	5				0.086						

Table 6.1.12: Prevalence of doctor diagnosed allergic rhinitis by school, by primary grade, by district and by survey year

School	Primary grade	Southern				School	Primary grade	Kwai Tsing			
		Survey year						Survey year			
		1989	1990	1991	1992			1989	1990	1991	1992
11	3	0.144		0.170	0.164	21	3	0.131		0.166	0.147
	4	0.179	0.223	0.218	0.215		4	0.137	0.146	0.195	0.202
	5		0.194	0.211	0.264		5		0.164	0.164	0.217
	6			0.203	0.242		6			0.167	0.211
12	3	0.033		0.054	0.114	22	3	0.038		0.098	0.162
	4	0.000	0.067	0.070	0.102		4	0.088	0.095	0.095	0.074
	5		0.050	0.033	0.023		5		0.079	0.059	0.113
	6			0.068	0.052		6			0.102	0.136
13	3	0.057		0.114	0.128	23	3	0.064		0.048	0.057
	4	0.074	0.064	0.064	0.144		4	0.029	0.073	0.019	0.071
	5		0.088	0.096	0.069		5		0.085	0.100	0.103
	6			0.082	0.071		6			0.060	0.156
14	3	0.067		0.118	0.000	24	3	0.092		0.032	0.169
	4	0.105	0.061	0.075	0.177		4	0.106	0.086	0.118	0.215
	5		0.128	0.154	0.117		5		0.123	0.102	0.146
	6			0.125	0.128		6			0.089	0.149
15	3			0.179	0.148	25	3	0.143		0.110	0.215
	4			0.186	0.206		4	0.202	0.179	0.208	0.235
	5			0.197	0.201		5		0.204	0.171	0.254
	6			0.187	0.222		6			0.239	0.230
16	3	0.161		0.141	0.188	26	3			0.151	0.187
	4	0.167	0.182	0.236	0.166		4			0.099	0.161
	5		0.178	0.209	0.260		5				0.157
	6			0.173	0.220						
17	3			0.130	0.241	27	3			0.200	0.224
	4			0.250	0.209		4			0.163	0.233
	5				0.295		5				0.230
18	3			0.116	0.166						
	4			0.130	0.166						
	5				0.183						

Table 6.1.13: Prevalence of doctor diagnosed sinusitis by school, by primary grade, by district and by survey year

		Southern						Kwai Tsing			
		Survey year						Survey year			
School	Primary grade	1989	1990	1991	1992	School	Primary grade	1989	1990	1991	1992
11	3	0.018		0.031	0.017	21	3	0.014		0.020	0.018
	4	0.031	0.026	0.026	0.039		4	0.024	0.007	0.026	0.022
	5		0.019	0.015	0.044		5		0.022	0.015	0.026
	6			0.026	0.011		6			0.030	0.031
12	3	0.033		0.000	0.000	22	3	0.000		0.016	0.027
	4	0.000	0.000	0.047	0.051		4	0.000	0.000	0.014	0.015
	5		0.000	0.000	0.045		5		0.010	0.000	0.000
	6			0.000	0.017		6			0.020	0.010
13	3	0.000		0.000	0.058	23	3	0.000		0.024	0.029
	4	0.037	0.009	0.028	0.022		4	0.010	0.012	0.037	0.024
	5		0.024	0.000	0.017		5		0.008	0.025	0.017
	6			0.030	0.000		6			0.017	0.026
14	3	0.000		0.039	0.000	24	3	0.007		0.016	0.016
	4	0.000	0.030	0.050	0.016		4	0.020	0.007	0.007	0.031
	5		0.000	0.026	0.000		5		0.015	0.006	0.033
	6			0.000	0.000		6			0.016	0.006
15	3			0.027	0.024	25	3	0.015		0.029	0.029
	4			0.024	0.029		4	0.027	0.018	0.021	0.037
	5			0.040	0.029		5		0.020	0.028	0.018
	6			0.012	0.029		6			0.020	0.028
16	3	0.003		0.024	0.013	26	3			0.018	0.025
	4	0.010	0.007	0.010	0.042		4			0.016	0.036
	5		0.004	0.010	0.023		5				0.009
	6			0.000	0.017						
17	3			0.019	0.000	27	3			0.038	0.022
	4			0.006	0.046		4			0.043	0.043
	5				0.026		5				0.059
18	3			0.029	0.025						
	4			0.023	0.022						
	5				0.023						

Table 6.1.14: Sample sizes for 6.1.15 to 6.1.19 by gender, by primary grade, by district and by survey year

Gender	Primary grade	District	Survey year 1989	1990	1991	1992
Boys	3	Southern	411		735	728
		Kwai Tsing	506		732	692
	4	Southern	441	400	767	743
		Kwai Tsing	569	500	730	726
	5	Southern		428	509	777
		Kwai Tsing		566	464	729
	6	Southern			498	505
		Kwai Tsing			528	460
Girls	3	Southern	337		785	755
		Kwai Tsing	451		673	675
	4	Southern	315	339	825	781
		Kwai Tsing	491	454	676	681
	5	Southern		309	425	824
		Kwai Tsing		488	445	658
	6	Southern			395	433
		Kwai Tsing			470	448

Table 6.1.15: Prevalence of cough by gender, by primary grade, by district and by survey year

Cough	Gender	Primary grade	District	Survey year 1989	1990	1991	1992
Morning cough	Boys	3	Southern	0.102		0.170	0.223
			Kwai Tsing	0.140		0.195	0.207
		4	Southern	0.091	0.093	0.130	0.136
			Kwai Tsing	0.083	0.102	0.137	0.163
		5	Southern		0.086	0.077	0.127
			Kwai Tsing		0.078	0.082	0.111
		6	Southern			0.058	0.079
			Kwai Tsing			0.047	0.091
	Girls	3	Southern	0.080		0.162	0.209
			Kwai Tsing	0.106		0.135	0.191
		4	Southern	0.048	0.053	0.105	0.099
			Kwai Tsing	0.077	0.075	0.112	0.122
		5	Southern		0.042	0.052	0.068
			Kwai Tsing		0.037	0.036	0.084
		6	Southern			0.028	0.060
			Kwai Tsing			0.021	0.040
Evening cough	Boys	3	Southern	0.085		0.184	0.228
			Kwai Tsing	0.138		0.183	0.211
		4	Southern	0.077	0.075	0.134	0.131
			Kwai Tsing	0.098	0.094	0.123	0.163
		5	Southern		0.068	0.067	0.106
			Kwai Tsing		0.076	0.078	0.092
		6	Southern			0.042	0.046
			Kwai Tsing			0.030	0.076
	Girls	3	Southern	0.083		0.163	0.204
			Kwai Tsing	0.102		0.137	0.172
		4	Southern	0.076	0.056	0.098	0.110
			Kwai Tsing	0.077	0.066	0.101	0.110
		5	Southern		0.029	0.049	0.080
			Kwai Tsing		0.035	0.049	0.074
		6	Southern			0.023	0.051
			Kwai Tsing			0.028	0.042
Cough for 3 months	Boys	3	Southern	0.036		0.086	0.120
			Kwai Tsing	0.053		0.096	0.127
		4	Southern	0.016	0.033	0.052	0.058
			Kwai Tsing	0.044	0.044	0.041	0.079
		5	Southern		0.030	0.041	0.046
			Kwai Tsing		0.039	0.024	0.058
		6	Southern			0.012	0.024
			Kwai Tsing			0.021	0.037
	Girls	3	Southern	0.021		0.062	0.082
			Kwai Tsing	0.040		0.058	0.090
		4	Southern	0.025	0.018	0.039	0.042
			Kwai Tsing	0.024	0.018	0.050	0.063
		5	Southern		0.010	0.028	0.032
			Kwai Tsing		0.023	0.018	0.047
		6	Southern			0.013	0.028
			Kwai Tsing			0.011	0.027

Table 6.1.16: Prevalence of phlegm by gender, by primary grade, by district and by survey year

Phlegm	Gender	Primary grade	District	Survey year 1989	1990	1991	1992
Morning phlegm	Boys	3	Southern	0.124		0.128	0.125
			Kwai Tsing	0.144		0.134	0.176
		4	Southern	0.100	0.100	0.096	0.108
			Kwai Tsing	0.142	0.100	0.096	0.136
		5	Southern		0.105	0.067	0.093
			Kwai Tsing		0.092	0.067	0.097
		6	Southern			0.064	0.103
			Kwai Tsing			0.068	0.100
	Girls	3	Southern	0.119		0.120	0.134
			Kwai Tsing	0.122		0.110	0.135
		4	Southern	0.086	0.083	0.075	0.099
			Kwai Tsing	0.124	0.086	0.102	0.097
		5	Southern		0.071	0.073	0.074
			Kwai Tsing		0.086	0.052	0.081
		6	Southern			0.058	0.060
			Kwai Tsing			0.040	0.071
Phlegm day or night	Boys	3	Southern	0.122		0.147	0.151
			Kwai Tsing	0.126		0.141	0.186
		4	Southern	0.113	0.100	0.089	0.089
			Kwai Tsing	0.123	0.110	0.105	0.109
		5	Southern		0.079	0.053	0.084
			Kwai Tsing		0.074	0.060	0.085
		6	Southern			0.052	0.085
			Kwai Tsing			0.051	0.067
	Girls		Southern	0.116		0.129	0.158
			Kwai Tsing	0.082		0.111	0.138
		4	Southern	0.073	0.068	0.088	0.091
			Kwai Tsing	0.086	0.075	0.075	0.076
		5	Southern		0.045	0.047	0.050
			Kwai Tsing		0.053	0.047	0.059
		6	Southern			0.041	0.053
			Kwai Tsing			0.028	0.045
Phlegm for 3 months	Boys	3	Southern	0.039		0.106	0.114
			Kwai Tsing	0.075		0.090	0.152
		4	Southern	0.041	0.053	0.060	0.090
			Kwai Tsing	0.054	0.058	0.075	0.090
		5	Southern		0.047	0.049	0.075
			Kwai Tsing		0.057	0.030	0.062
		6	Southern			0.042	0.061
			Kwai Tsing			0.038	0.067
	Girls	3	Southern	0.021		0.055	0.103
			Kwai Tsing	0.035		0.053	0.092
		4	Southern	0.038	0.027	0.042	0.046
			Kwai Tsing	0.037	0.031	0.041	0.059
		5	Southern		0.016	0.033	0.047
			Kwai Tsing		0.031	0.029	0.055
		6	Southern			0.028	0.025
			Kwai Tsing			0.015	0.047

Table 6.1.17 Prevalence of sore throat and nasal symptoms by gender, by primary grade, by district and by survey year

Symptom	Gender	Primary grade	District	Survey year 1989	1990	1991	1992
Sore throat	Boys	3	Southern	0.061		0.125	0.202
			Kwai Tsing	0.101		0.143	0.231
		4	Southern	0.048	0.065	0.115	0.127
			Kwai Tsing	0.098	0.114	0.123	0.185
		5	Southern		0.063	0.100	0.149
			Kwai Tsing		0.111	0.069	0.133
		6	Southern			0.062	0.111
			Kwai Tsing			0.072	0.148
	Girls	3	Southern			0.122	0.249
			Kwai Tsing			0.116	0.210
		4	Southern	0.044	0.068	0.104	0.131
			Kwai Tsing	0.073	0.090	0.120	0.167
		5	Southern		0.049	0.071	0.127
			Kwai Tsing		0.074	0.047	0.172
		6	Southern			0.046	0.076
			Kwai Tsing			0.040	0.123
Nasal symptoms	Boys	3	Southern	0.302		0.412	0.486
			Kwai Tsing	0.356		0.413	0.477
		4	Southern	0.329	0.288	0.455	0.409
			Kwai Tsing	0.374	0.304	0.437	0.492
		5	Southern		0.276	0.352	0.434
			Kwai Tsing		0.269	0.306	0.442
		6	Southern			0.281	0.358
			Kwai Tsing			0.297	0.383
	Girls	3	Southern			0.390	0.448
			Kwai Tsing			0.352	0.461
		4	Southern	0.238	0.212	0.389	0.342
			Kwai Tsing	0.287	0.227	0.343	0.402
		5	Southern		0.159	0.264	0.351
			Kwai Tsing		0.211	0.249	0.372
		6	Southern			0.215	0.240
			Kwai Tsing			0.189	0.321

Table 6.1.18: Prevalence of wheezing by gender, by primary grade, by district and by survey year

Symptom	Gender	Primary grade	District	Survey year 1989	1990	1991	1992
Wheezing	Boys	3	Southern	0.095		0.112	0.114
			Kwai Tsing	0.136		0.119	0.176
		4	Southern	0.102	0.120	0.120	0.110
			Kwai Tsing	0.132	0.122	0.145	0.152
		5	Southern		0.126	0.096	0.122
			Kwai Tsing		0.140	0.086	0.152
		6	Southern			0.094	0.093
			Kwai Tsing			0.097	0.093
	Girls	3	Southern	0.059		0.080	0.090
			Kwai Tsing	0.069		0.088	0.101
		4	Southern	0.041	0.074	0.070	0.078
			Kwai Tsing	0.079	0.055	0.067	0.088
		5	Southern		0.036	0.054	0.051
			Kwai Tsing		0.074	0.058	0.081
		6	Southern			0 025	0.058
			Kwai Tsing			0.045	0.074

Table 6.1.19: Prevalence of diagnosed asthma, allergic rhinitis and sinusitis by gender, by primary grade, by district and by survey year

Symptoms	Gender	Primary grade	District	Survey year 1989	1990	1991	1992
Diagnosed asthma	Boys	3	Southern	0.100		0.110	0.092
			Kwai Tsing	0.097		0.090	0.094
		4	Southern	0.091	0.080	0.098	0.110
			Kwai Tsing	0.097	0.090	0.086	0.109
		5	Southern		0.103	0.077	0.116
			Kwai Tsing		0.104	0.078	0.099
		6	Southern			0.088	0.077
			Kwai Tsing			0.100	0.096
	Girls	3	Southern	0.056		0.055	0.049
			Kwai Tsing	0.040		0.039	0.061
		4	Southern	0.035	0.047	0.056	0.052
			Kwai Tsing	0.043	0.042	0.041	0.062
		5	Southern		0.029	0.040	0.056
			Kwai Tsing		0.033	0.036	0.044
		6	Southern			0.033	0.053
			Kwai Tsing			0.032	0.042
Diagnosed allergic rhinitis	Boys	3	Southern	0.151		0.171	0.181
			Kwai Tsing	0.140		0.138	0.205
		4	Southern	0.175	0.205	0.201	0.218
			Kwai Tsing	0.170	0.142	0.185	0.238
		5	Southern		0.199	0.230	0.247
			Kwai Tsing		0.193	0.157	0.247
		6	Southern			0.195	0.236
			Kwai Tsing			0.191	0.215
	Girls	3	Southern	0.107		0.124	0.156
			Kwai Tsing	0.084		0.138	0.173
		4	Southern	0.098	0.127	0.168	0.157
			Kwai Tsing	0.104	0.130	0.129	0.160
		5	Southern		0.104	0.129	0.177
			Kwai Tsing		0.107	0.126	0.152
		6	Southern			0.119	0.143
			Kwai Tsing			0.128	0.172
Diagnosed sinusitis	Boys	3	Southern	0.017		0.035	0.029
			Kwai Tsing	0.012		0.033	0.022
		4	Southern	0.027	0.018	0.030	0.047
			Kwai Tsing	0.026	0.016	0.036	0.043
		5	Southern		0.016	0.014	0.036
			Kwai Tsing		0.019	0.019	0.037
		6	Southern			0.022	0.012
			Kwai Tsing			0.027	0.022
	Girls	3	Southern	0.000		0.015	0.009
			Kwai Tsing	0.009		0.018	0.025
		4	Southern	0.013	0.012	0.013	0.022
			Kwai Tsing	0.014	0.004	0.013	0.023
		5	Southern		0.006	0.019	0.021
			Kwai Tsing		0.014	0.016	0.018
		6	Southern			0.003	0.018
			Kwai Tsing			0.017	0.025

Table 6.2.1: Sample sizes for tables 6.2.2 to 6.2.6 by fathers' educational attainment, by district and by survey year

Educational attainment	Southern				Kwai Tsing			
	Survey year				Survey year			
	1989	1990	1991	1992	1989	1990	1991	1992
No formal education	119	135	553	572	129	137	267	247
Primary	387	407	1484	1704	779	745	1742	1847
Lower secondary	357	370	1235	1461	578	583	1530	1771
Upper secondary	390	358	1011	1034	279	329	760	810
Post secondary	119	111	272	300	60	58	115	126

Table 6.2.2: Prevalence of cough by fathers' educational attainment, by district and by survey year

Symptom	Educational attainment	Southern 1989	Southern 1990	Southern 1991	Southern 1992	Kwai Tsing 1989	Kwai Tsing 1990	Kwai Tsing 1991	Kwai Tsing 1992
Morning cough	No formal education	0.126	0.081	0.123	0.156	0.070	0.066	0.105	0.146
	Primary	0.096	0.084	0.123	0.133	0.097	0.077	0.113	0.139
	Lower secondary	0.078	0.070	0.096	0.125	0.107	0.075	0.103	0.129
	Upper secondary	0.072	0.050	0.085	0.103	0.065	0.076	0.083	0.119
	Post secondary	0.042	0.072	0.099	0.103	0.133	0.017	0.061	0.079
Evening cough	No formal education	0.076	0.059	0.119	0.159	0.109	0.073	0.105	0.138
	Primary	0.098	0.052	0.117	0.122	0.099	0.072	0.103	0.122
	Lower secondary	0.073	0.073	0.104	0.113	0.114	0.069	0.093	0.117
	Upper secondary	0.072	0.053	0.083	0.120	0.072	0.058	0.086	0.111
	Post secondary	0.034	0.054	0.070	0.097	0.100	0.052	0.078	0.119
Cough for 3 months	No formal education	0.008	0.022	0.033	0.052	0.031	0.036	0.041	0.045
	Primary	0.018	0.034	0.045	0.052	0.044	0.027	0.040	0.065
	Lower secondary	0.034	0.014	0.049	0.060	0.048	0.041	0.044	0.072
	Upper secondary	0.021	0.022	0.045	0.049	0.022	0.027	0.038	0.067
	Post secondary	0.017	0.027	0.055	0.043	0.033	0.000	0.052	0.056

Table 6.2.3: Prevalence of phlegm by fathers' educational attainment, by district and by survey year

Symptom	Educational attainment	Southern 1989	Southern 1990	Southern 1991	Southern 1992	Kwai Tsing 1989	Kwai Tsing 1990	Kwai Tsing 1991	Kwai Tsing 1992
Morning phlegm	No formal education	0.160	0.089	0.089	0.101	0.109	0.095	0.090	0.126
	Primary	0.111	0.108	0.094	0.104	0.137	0.093	0.098	0.117
	Lower secondary	0.098	0.086	0.079	0.105	0.131	0.089	0.078	0.107
	Upper secondary	0.108	0.078	0.092	0.081	0.118	0.085	0.070	0.102
	Post secondary	0.084	0.108	0.066	0.087	0.167	0.121	0.070	0.119
Phlegm day or night	No formal education	0.151	0.104	0.099	0.110	0.101	0.088	0.109	0.109
	Primary	0.116	0.081	0.092	0.098	0.107	0.078	0.087	0.100
	Lower secondary	0.101	0.062	0.086	0.097	0.100	0.084	0.081	0.098
	Upper secondary	0.100	0.075	0.074	0.074	0.082	0.073	0.057	0.085
	Post secondary	0.101	0.063	0.066	0.100	0.167	0.086	0.070	0.071
Phlegm for 3 months	No formal education	0.042	0.052	0.052	0.080	0.039	0.044	0.037	0.069
	Primary	0.036	0.034	0.046	0.071	0.044	0.046	0.054	0.077
	Lower secondary	0.039	0.032	0.053	0.070	0.052	0.050	0.048	0.081
	Upper secondary	0.033	0.047	0.061	0.059	0.047	0.021	0.050	0.070
	Post secondary	0.025	0.036	0.059	0.063	0.067	0.052	0.026	0.127

Table 6.2.4: Prevalence of sore throat and nasal symptoms by fathers' educational attainment, by district and by survey year

Symptom	Educational attainment	Southern Survey year 1989	1990	1991	1992	Kwai Tsing Survey year 1989	1990	1991	1992
Sore throat	No formal education	0.076	0.067	0.108	0.157	0.101	0.109	0.112	0.215
	Primary	0.049	0.071	0.096	0.151	0.063	0.098	0.095	0.160
	Lower secondary	0.078	0.065	0.102	0.148	0.114	0.110	0.095	0.176
	Upper secondary	0.038	0.045	0.097	0.139	0.079	0.082	0.091	0.173
	Post secondary	0.017	0.045	0.081	0.097	0.083	0.034	0.078	0.119
Nasal symptoms	No formal education	0.319	0.207	0.362	0.425	0.279	0.226	0.333	0.417
	Primary	0.279	0.231	0.363	0.379	0.361	0.250	0.323	0.420
	Lower secondary	0.255	0.246	0.366	0.395	0.336	0.293	0.346	0.433
	Upper secondary	0.313	0.235	0.354	0.373	0.247	0.225	0.313	0.407
	Post secondary	0.269	0.324	0.349	0.367	0.367	0.259	0.348	0.405

Table 6.2.5: Prevalence of wheezing by fathers' educational attainment, by district and by survey year

Symptom	Educational attainment	Southern Survey year 1989	1990	1991	1992	Kwai Tsing Survey year 1989	1990	1991	1992
Wheezing	No formal education	0.042	0.052	0.061	0.068	0.093	0.080	0.071	0.077
	Primary	0.070	0.069	0.077	0.091	0.097	0.094	0.092	0.112
	Lower secondary	0.084	0.108	0.079	0.087	0.112	0.099	0.093	0.132
	Upper secondary	0.064	0.089	0.091	0.097	0.111	0.116	0.096	0.117
	Post secondary	0.160	0.216	0.125	0.133	0.133	0.172	0.087	0.103

Table 6.2.6: Prevalence of doctor diagnosed asthma, allergic rhinitis and sinusitis by fathers' educational attainment, by district and by survey year

Symptom	Educational attainment	Southern				Kwai Tsing			
		Survey year				Survey year			
		1989	1990	1991	1992	1989	1990	1991	1992
Diagnosed asthma	No formal education	0.050	0.030	0.043	0.054	0.070	0.073	0.052	0.081
	Primary	0.067	0.057	0.061	0.067	0.071	0.071	0.063	0.076
	Lower secondary	0.084	0.070	0.070	0.072	0.069	0.060	0.067	0.080
	Upper secondary	0.069	0.070	0.086	0.099	0.072	0.070	0.064	0.073
	Post secondary	0.109	0.153	0.114	0.123	0.133	0.121	0.070	0.063
Diagnosed allergic rhinitis	No formal education	0.059	0.067	0.094	0.140	0.085	0.117	0.142	0.154
	Primary	0.121	0.125	0.144	0.167	0.130	0.129	0.128	0.177
	Lower secondary	0.160	0.195	0.179	0.192	0.135	0.168	0.165	0.215
	Upper secondary	0.159	0.207	0.205	0.227	0.165	0.170	0.166	0.226
	Post secondary	0.210	0.270	0.232	0.293	0.117	0.172	0.200	0.238
Diagnosed sinusitis	No formal education	0.000	0.000	0.016	0.016	0.000	0.007	0.030	0.020
	Primary	0.013	0.010	0.022	0.022	0.015	0.012	0.022	0.028
	Lower secondary	0.011	0.014	0.019	0.025	0.014	0.017	0.024	0.025
	Upper secondary	0.021	0.025	0.019	0.029	0.022	0.012	0.020	0.035
	Post secondary	0.042	0.018	0.033	0.037	0.033	0.034	0.026	0.063

Table 6.3.1: Sample sizes for tables 6.3.2 to 6.3.6 for all types of fuel used, by district and by survey year

	Southern				Kwai Tsing			
	Survey year				Survey year			
Type of fuel used	1989	1990	1991	1992	1989	1990	1991	1992
Town gas, LP gas, kerosene, firewood, electricity	1504	1486	4993	5605	2017	2027	4785	5137

Table 6.3.2: Prevalence of cough by type of fuel used, by district and by survey year

		Southern				Kwai Tsing			
		Survey year				Survey year			
Symptom	Type of fuel used	1989	1990	1991	1992	1989	1990	1991	1992
Morning cough	Towngas	0.082	0.073	0.107	0.124	0.116	0.077	0.105	0.133
	LP gas	0.085	0.068	0.106	0.124	0.070	0.059	0.104	0.128
	Kerosene	0.140	0.032	0.099	0.110	0.098	0.079	0.086	0.125
	Firewood	0.000	0.000	0.273	0.273	0.167	0.000	0.000	0.067
	Electricity	0.067	0.093	0.117	0.146	0.098	0.026	0.080	0.136
Evening cough	Towngas	0.064	0.057	0.103	0.117	0.113	0.073	0.101	0.128
	LP gas	0.094	0.065	0.104	0.125	0.081	0.056	0.087	0.102
	Kerosene	0.080	0.032	0.124	0.119	0.098	0.059	0.087	0.106
	Firewood	0.000	0.000	0.364	0.182	0.000	0.000	0.091	0.133
	Electricity	0.058	0.081	0.117	0.143	0.108	0.079	0.057	0.111
Cough for 3 months	Towngas	0.020	0.023	0.048	0.053	0.049	0.032	0.044	0.072
	LP gas	0.025	0.024	0.040	0.055	0.027	0.026	0.038	0.059
	Kerosene	0.050	0.016	0.058	0.037	0.038	0.031	0.037	0.051
	Firewood	0.000	0.000	0.091	0.000	0.000	0.000	0.000	0.133
	Electricity	0.029	0.047	0.053	0.074	0.020	0.013	0.042	0.075

Table 6.3.3: Prevalence of phlegm by type of fuel used, by district and by survey year

		Southern				Kwai Tsing			
		Survey year				Survey year			
Symptom	Type of fuel used	1989	1990	1991	1992	1989	1990	1991	1992
Morning phlegm	Towngas	0.092	0.091	0.077	0.089	0.141	0.091	0.088	0.114
	LP gas	0.123	0.098	0.094	0.106	0.120	0.080	0.082	0.109
	Kerosene	0.160	0.032	0.103	0.100	0.140	0.124	0.077	0.112
	Firewood	0.333	0.000	0.091	0.182	0.167	0.000	0.091	0.133
	Electricity	0.087	0.128	0.121	0.095	0.186	0.105	0.094	0.125
Evening phlegm	Towngas	0.099	0.062	0.086	0.089	0.120	0.079	0.086	0.100
	LP gas	0.116	0.083	0.084	0.096	0.081	0.073	0.074	0.092
	Kerosene	0.120	0.032	0.091	0.068	0.100	0.073	0.077	0.086
	Firewood	0.333	0.000	0.273	0.182	0.000	0.000	0.182	0.133
	Electricity	0.096	0.093	0.095	0.090	0.108	0.053	0.080	0.093
Phlegm for 3 months	Towngas	0.028	0.042	0.058	0.063	0.053	0.044	0.048	0.087
	LP gas	0.040	0.036	0.051	0.074	0.042	0.044	0.051	0.067
	Kerosene	0.060	0.032	0.070	0.064	0.042	0.051	0.046	0.051
	Firewood	0.000	0.000	0.182	0.091	0.000	0.000	0.091	0.000
	Electricity	0.019	0.116	0.053	0.064	0.088	0.053	0.042	0.057

Table 6.3.4: Prevalence of sore throat and nasal symptoms by type of fuel used, by district and by survey year

		Southern				Kwai Tsing			
		Survey year				Survey year			
Symptom	Type of fuel used	1989	1990	1991	1992	1989	1990	1991	1992
Sore throat	Towngas	0.055	0.059	0.107	0.142	0.085	0.094	0.095	0.172
	LP gas	0.053	0.065	0.088	0.148	0.081	0.098	0.096	0.169
	Kerosene	0.040	0.016	0.095	0.128	0.089	0.107	0.083	0.167
	Firewood	0.000	0.000	0.000	0.182	0.167	0.000	0.000	0.133
	Electricity	0.019	0.093	0.117	0.146	0.137	0.053	0.080	0.164
Nasal symptoms	Towngas	0.290	0.275	0.384	0.388	0.353	0.265	0.351	0.445
	LP gas	0.292	0.215	0.339	0.380	0.307	0.245	0.297	0.377
	Kerosene	0.240	0.143	0.310	0.379	0.350	0.234	0.305	0.408
	Firewood	0.333	0.000	0.273	0.455	0.167	0.000	0.091	0.600
	Electricity	0.240	0.314	0.326	0.406	0.275	0.184	0.335	0.407

Table 6.3.5: Prevalence of wheezing by type of fuel used, by district and by survey year

		Southern				Kwai Tsing			
		Survey year				Survey year			
Symptom	Type of fuel used	1989	1990	1991	1992	1989	1990	1991	1992
Wheezing	Towngas	0.095	0.109	0.090	0.092	0.116	0.099	0.090	0.125
	LP gas	0.064	0.083	0.075	0.089	0.089	0.091	0.093	0.101
	Kerosene	0.110	0.079	0.099	0.091	0.076	0.088	0.075	0.095
	Firewood	0.333	0.000	0.091	0.000	0.000	0.250	0.273	0.133
	Electricity	0.067	0.093	0.080	0.101	0.127	0.079	0.123	0.121

Table 6.3.6: Prevalence of doctor diagnosed asthma, allergic rhinitis and sinusitis by type of fuel used, by district and by survey year

		Southern				Kwai Tsing			
		Survey year				Survey year			
Symptom	Type of fuel used	1989	1990	1991	1992	1989	1990	1991	1992
Diagnosed asthma	Towngas	0.084	0.086	0.075	0.082	0.076	0.072	0.067	0.078
	LP gas	0.067	0.055	0.067	0.070	0.065	0.056	0.060	0.073
	Kerosene	0.080	0.079	0.099	0.064	0.053	0.056	0.038	0.059
	Firewood	0.333	0.000	0.091	0.182	0.167	0.250	0.091	0.200
	Electricity	0.077	0.081	0.095	0.103	0.098	0.053	0.080	0.093
Diagnosed allergic rhinitis	Towngas	0.164	0.207	0.191	0.210	0.153	0.161	0.169	0.218
	LP gas	0.130	0.139	0.140	0.165	0.114	0.129	0.125	0.166
	Kerosene	0.060	0.079	0.124	0.151	0.109	0.161	0.127	0.166
	Firewood	0.000	0.000	0.000	0.091	0.000	0.250	0.000	0.200
	Electricity	0.125	0 221	0.205	0.228	0.098	0.118	0.113	0.204
Diagnosed sinusitis	Towngas	0.017	0.020	0.022	0.023	0.011	0.014	0.027	0.029
	LP gas	0.015	0.009	0.019	0.024	0.020	0.015	0.017	0.024
	Kerosene	0.020	0.000	0.037	0.014	0.013	0.008	0.015	0.018
	Firewood	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Electricity	0.010	0.023	0.030	0.040	0.039	0.026	0.014	0.043

Table 6.4.1: Sample sizes for 6.4.2 to 6.4.6 by number of smokers in the family home, by district and by survey year

Number of smokers in the family home	Southern				Kwai Tsing			
	Survey year				Survey year			
	1989	1990	1991	1992	1989	1990	1991	1992
0	855	861	3001	3143	1005	1008	2661	2587
1	492	475	1510	1843	768	778	1673	1959
≥2	157	150	483	619	244	241	451	591

Table 6.4.2: Prevalence of cough by number of smokers in the family home, by district and by survey year

Symptom	Number of smokers in the family home	Southern				Kwai Tsing			
		Survey year				Survey year			
		1989	1990	1991	1992	1989	1990	1991	1992
Morning cough	0	0.078	0.064	0.092	0.112	0.096	0.063	0.087	0.105
	1	0.077	0.076	0.134	0.143	0.095	0.069	0.117	0.148
	≥2	0.121	0.107	0.128	0.171	0.143	0.124	0.160	0.200
Evening cough	0	0.068	0.051	0.087	0.103	0.095	0.051	0.085	0.101
	1	0.087	0.069	0.128	0.141	0.098	0.084	0.106	0.133
	≥2	0.127	0.087	0.157	0.187	0.164	0.095	0.146	0.183
Cough for 3 months	0	0.020	0.024	0.045	0.046	0.032	0.030	0.039	0.063
	1	0.024	0.021	0.046	0.066	0.049	0.030	0.041	0.064
	≥2	0.051	0.033	0.050	0.076	0.049	0.046	0.082	0.105

Table 6.4.3: Prevalence of phlegm by number of smokers in the family home, by district and by survey year

Symptom	Number of smokers in the family home	Southern				Kwai Tsing			
		Survey year				Survey year			
		1989	1990	1991	1992	1989	1990	1991	1992
Morning phlegm	0	0.099	0.074	0.076	0.084	0.118	0.062	0.073	0.098
	1	0.104	0.116	0.104	0.103	0.142	0.109	0.101	0.123
	≥2	0.166	0.113	0.120	0.174	0.172	0.154	0.126	0.156
Phlegm day or night	0	0.098	0.058	0.074	0.080	0.083	0.054	0.072	0.082
	1	0.108	0.086	0.110	0.099	0.118	0.094	0.087	0.108
	≥2	0.159	0.140	0.104	0.170	0.160	0.124	0.129	0.146
Phlegm for 3 months	0	0.027	0.028	0.049	0.064	0.042	0.032	0.041	0.068
	1	0.045	0.042	0.063	0.075	0.059	0.050	0.056	0.087
	≥2	0.051	0.073	0.066	0.103	0.066	0.079	0.078	0.105

Table 6.4.4: Prevalence of sore throat and nasal symptoms by number of smokers in the family home, by district and by survey year

Symptom	Number of smokers in the family home	Southern				Kwai Tsing			
		Survey year				Survey year			
		1989	1990	1991	1992	1989	1990	1991	1992
Sore throat	0	0.035	0.046	0.080	0.124	0.085	0.072	0.078	0.151
	1	0.065	0.082	0.118	0.167	0.083	0.118	0.115	0.184
	≥2	0.115	0.080	0.153	0.236	0.098	0.141	0.144	0.237
Nasal symptoms	0	0.256	0.243	0.333	0.362	0.337	0.236	0.303	0.388
	1	0.309	0.238	0.395	0.410	0.311	0.256	0.356	0.447
	≥2	0.395	0.240	0.412	0.475	0.385	0.315	0.417	0.492

Table 6.4.5: Prevalence of wheezing by number of smokers in the family home, by district and by survey year

Symptom	Number of smokers in the family home	Southern				Kwai Tsing			
		Survey year				Survey year			
		1989	1990	1991	1992	1989	1990	1991	1992
Wheezing	0	0.078	0.095	0.080	0.088	0.094	0.093	0.083	0.101
	1	0.077	0.095	0.087	0.082	0.116	0.103	0.097	0.126
	≥2	0.076	0.080	0.108	0.121	0.127	0.124	0.111	0.166

Table 6.4.6: Prevalence of doctor diagnosed asthma, allergic rhinitis and diagnosed sinusitis by number of smokers in the family home, by district and by survey year

Symptom	Number of smokers in the family home	Southern				Kwai Tsing			
		Survey year				Survey year			
		1989	1990	1991	1992	1989	1990	1991	1992
Diagnosed asthma	0	0.082	0.075	0.076	0.083	0.072	0.078	0.060	0.072
	1	0.063	0.061	0.066	0.059	0.074	0.059	0.063	0.083
	≥2	0.064	0.053	0.066	0.094	0.057	0.066	0.082	0.076
Diagnosed allergic rhinitus	0	0.144	0.182	0.174	0.200	0.142	0.153	0.155	0.211
	1	0.138	0.141	0.162	0.178	0.124	0.143	0.137	0.185
	≥2	0.096	0.127	0.137	0.173	0.078	0.120	0.144	0.178
Diagnosed sinusitis	0	0.019	0.015	0.020	0.024	0.021	0.017	0.022	0.023
	1	0.012	0.011	0.021	0.021	0.009	0.013	0.022	0.032
	≥2	0.006	0.013	0.017	0.044	0.016	0.008	0.031	0.032

Table 6.5.1: Prevalence of cough by district and by survey year

	Southern								Kwai Tsing							
	Survey year								Survey year							
	1989		1990		1991		1992		1989		1990		1991		1992	
Symptom	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Morning cough																
Yes	124	8.3	107	7.2	540	10.9	721	12.9	204	10.1	148	7.4	499	10.6	679	13.2
No	1369	91.7	1370	92.8	4399	89.1	4883	87.1	1807	89.9	1853	92.6	4218	89.4	4454	86.8
Evening cough																
Yes	121	8.1	90	6.1	532	10.8	700	12.5	210	10.4	139	7.0	471	10.0	629	12.3
No	1372	91.9	1385	93.9	4407	89.2	4903	87.5	1800	89.6	1861	93.1	4247	90.0	4505	87.7
Cough for 3 months																
Yes	37	2.5	36	2.4	228	4.6	312	5.6	82	4.1	64	3.2	208	4.4	352	6.9
No	1455	97.5	1441	97.6	4711	95.4	5293	94.4	1929	95.9	1937	96.8	4509	95.6	4782	93.1

Table 6.5.2: Prevalence of phlegm by district and by survey year

	Southern								Kwai Tsing							
	Survey year								Survey year							
	1989		1990		1991		1992		1989		1990		1991		1992	
Symptom	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Morning phlegm																
Yes	162	10.9	136	9.2	444	9.0	561	10.0	270	13.4	184	9.2	420	8.9	586	11.4
No	1331	89.1	1341	90.8	4495	91.0	5044	90.0	1741	86.6	1817	90.8	4298	91.1	4548	88.6
Phlegm day or night																
Yes	162	10.9	112	7.6	439	8.9	541	9.7	213	10.6	157	7.8	395	8.4	509	9.9
No	1331	89.1	1365	92.4	4499	91.1	5062	90.3	1799	89.4	1844	92.2	4323	91.6	4622	90.1
Phlegm for 3 months																
Yes	53	3.6	55	3.7	273	5.5	404	7.2	103	5.1	90	4.5	239	5.1	407	7.9
No	1439	96.4	1422	96.3	4666	94.5	5198	92.8	1909	94.9	1911	95.5	4478	94.9	4726	92.1

Table 6.5.3: Prevalence of sore throat and nasal symptoms by district and by survey year

	Southern								Kwai Tsing							
	Survey year								Survey year							
	1989		1990		1991		1992		1989		1990		1991		1992	
Symptom	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Sore throat																
Yes	80	5.4	91	6.2	492	10.0	845	15.1	173	8.6	199	10.0	464	9.8	892	17.4
No	1413	94.6	1386	93.8	4447	90.0	4758	84.9	1838	91.4	1801	90.1	4254	90.2	4243	82.6
Nasal symptoms																
Yes	433	29.0	358	24.2	1795	36.4	2186	39.0	672	33.4	513	25.6	1589	33.7	2170	42.3
No	1060	71.0	1119	75.8	3143	63.6	3415	61.0	1339	66.6	1488	74.4	3127	66.3	2963	57.7

Table 6.5.4: Prevalence of wheezing by district and by survey year

	Southern								Kwai Tsing							
	Survey year								Survey year							
	1989		1990		1991		1992		1989		1990		1991		1992	
Symptom	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Wheezing																
Yes	117	7.8	139	9.4	424	8.6	504	9.0	214	10.6	204	10.2	435	9.2	605	11.8
No	1374	92.2	1338	90.6	4511	91.4	5097	91.0	1796	89.4	1796	89.8	4282	90.8	4530	88.2

Table 6.5.5: Prevalence of doctor diagnosed asthma, allergic rhinitis and sinusitis by district and by survey year

	Southern								Kwai Tsing							
	Survey year								Survey year							
	1989		1990		1991		1992		1989		1990		1991		1992	
Symptom	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Diagnosed asthma																
Yes	111	7.4	102	6.9	358	7.3	426	7.6	143	7.2	141	7.1	303	6.4	393	7.7
No	1380	92.6	1374	93.1	4578	92.7	5172	92.4	1857	92.9	1859	93.0	4410	93.6	4735	92.3
Diagnosed allergic rhinitis																
Yes	206	13.8	243	16.5	832	16.8	1063	19.0	257	12.8	294	14.7	706	15.0	1012	19.7
No	1287	86.2	1234	83.5	4106	83.2	4539	81.0	1755	87.2	1707	85.3	4010	85.0	4122	80.3
Diagnosed sinusitis																
Yes	23	1.5	20	1.4	99	2.0	140	2.5	32	1.6	29	1.4	109	2.3	140	2.7
No	1469	98.5	1457	98.6	4839	98.0	5462	97.5	1978	98.4	1972	98.6	4608	97.7	4993	97.3

Table 6.6.1: Standard symptom ratio for morning cough by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.082	1504	0.135	0.61 (0.50, 0.71)
	Kwai Tsing	2017	0.101	2016	0.140	0.72 (0.62, 0.82)
1990	Southern	1486	0.072	1486	0.095	0.76 (0.61, 0.90)
	Kwai Tsing	2027	0.073	2027	0.097	0.75 (0.63, 0.87)
1991	Southern	4993	0.108	4943	0.108	1.00 (0.92, 1.08)
	Kwai Tsing	4785	0.104	4719	0.111	0.94 (0.85, 1.02)
1992	Southern	5605	0.129	5539	0.107	1.21 (1.12, 1.29)
	Kwai Tsing	5137	0.132	5059	0.107	1.23 (1.14, 1.33)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.3507	0.0179	381.7384	1	0.0000	-0.1416	0.7042
Gender	0.3339	0.0396	70.9993	1	0.0000	0.0603	1.3965
School session	0.0837	0.0395	4.4870	1	0.0342	0.0115	0.0873
Housing type	0.0462	0.0410	1.2683	1	0.2601	0.0000	1.0472
Education:							
primary	-0.1615	0.0568	8.0761	1	0.0045	-0.0179	0.8509
secondary	-0.2524	0.0587	18.4786	1	0.0000	-0.0295	0.7769
post-secondary	-0.4531	0.0648	48.8417	1	0.0000	-0.0497	0.6357
Smoking status:							
one smoker	0.2837	0.0428	44.0232	1	0.0000	0.0471	1.3281
two or more	0.5768	0.0591	95.2039	1	0.0000	0.0701	1.7803
Constant	1 2656	0.1898	44.4475	1	0.0000		

Table 6.6.2: Standard symptom ratio for evening cough by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.080	1504	0.134	0.60 (0.49, 0.70)
	Kwai Tsing	2017	0.104	2016	0.137	0.76 (0.66, 0.86)
1990	Southern	1486	0.061	1486	0.089	0.69 (0.54, 0.83)
	Kwai Tsing	2027	0.069	2027	0.089	0.77 (0.64, 0.89)
1991	Southern	4993	0.107	4943	0.104	1.03 (0.94, 1.12)
	Kwai Tsing	4785	0.098	4719	0.105	0.93 (0.85, 1.02)
1992	Southern	5605	0.125	5539	0.103	1.21 (1.12, 1.30)
	Kwai Tsing	5137	0.122	5059	0.101	1.21 (1.11, 1.30)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.4076	0.0187	475.4332	1	0.0000	-0.1603	0.6652
Gender	0.2846	0.0404	49.7361	1	0.0000	0.0509	1.3292
School session	0.0813	0.0403	4.0642	1	0.0438	0.0106	1.0847
Housing type	0.0015	0.0417	0.0013	1	0.9711	0.0000	1.0015
Education:							
primary	-0.2548	0.0578	19.4517	1	0.0000	-0.0308	0.7750
secondary	-0.3130	0.0595	27.7122	1	0.0000	-0.0374	0.7313
post-secondary	-0.4531	0.0650	48.6312	1	0.0000	-0.0503	0.6357
Smoking status:							
one smoker	0.3276	0.0438	56.0301	1	0.0000	0.0542	1.3876
two or more	0.6763	0.0595	129.0264	1	0.0000	0.0830	1.9666
Constant	1.8561	0.1961	89.6234	1	0.0000		

Table 6.6.3: Standard symptom ratio for cough for 3 months by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.025	1504	0.061	0.41 (0.28, 0.54)
	Kwai Tsing	2017	0.041	2016	0.061	0.67 (0.53, 0.82)
1990	Southern	1486	0.024	1486	0.042	0.57 (0.38, 0.76)
	Kwai Tsing	2027	0.032	2027	0.041	0.78 (0.59, 0.97)
1991	Southern	4993	0.046	4943	0.048	0.96 (0.83, 1.08)
	Kwai Tsing	4785	0.043	4719	0.048	0.90 (0.77, 1.02)
1992	Southern	5605	0.056	5539	0.047	1.19 (1.06, 1.32)
	Kwai Tsing	5137	0.069	5059	0.046	1.50 (1.34, 1.66)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.3510	0.0263	177.6600	1	0.0000	-0.1290	0.7040
Gender	0.3503	0.0578	36.7159	1	0.0000	0.0547	1.4195
School session	0.0041	0.0576	0.0051	1	0.9432	0.0000	1.0041
Housing type	-0.0506	0.0591	0.7323	1	0.3921	0.0000	0.9507
Education:							
primary	-0.1268	0.0859	2.1787	1	0.1399	-0.0041	0.8809
secondary	-0.0016	0.0858	0.0004	1	0.9849	0.0000	0.9984
post-secondary	-0.2349	0.0944	6.1928	1	0.0128		
Smoking status:						-0.0199	0.7907
one smoker	0.1590	0.0628	6.4103	1	0.0113	0.0204	1.1724
two or more	0.5362	0.0838	40.9421	1	0.0000	0.0608	1.7095
Constant	0.3648	0.2776	1.7262	1	0.1889		

Table 6.6.4: Standard symptom ratio for morning phlegm by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.108	1504	0.114	0.95 (0.80, 1.09)
	Kwai Tsing	2017	0.134	2016	0.117	1.15 (1.01, 1.28)
1990	Southern	1486	0.092	1486	0.094	0.98 (0.81, 1.14)
	Kwai Tsing	2027	0.091	2027	0.095	0.96 (0.82, 1.10)
1991	Southern	4993	0.089	4943	0.099	0.90 (0.82, 0.98)
	Kwai Tsing	4785	0.088	4719	0.100	0.89 (0.80, 0.97)
1992	Southern	5605	0.100	5539	0.099	1.01 (0.93, 1.09)
	Kwai Tsing	5137	0.114	5059	0.100	1.14 (1.05, 1.23)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.1871	0.0176	112.4345	1	0.0000	-0.0786	0.8294
Gender	0.1961	0.0407	23.1848	1	0.0000	0.0344	1.2167
School session	0.2022	0.0407	24.7284	1	0.0000	0.0357	1.2241
Housing type	0.0263	0.0423	0.3853	1	0.5348	0.0000	1.0266
Education:							
primary	-0.0706	0.0598	1.3943	1	0.2377	0.0000	0.9318
secondary	-0.1811	0.0620	8.5418	1	0.0035	-0.0191	0.8343
post-secondary	-0.2050	0.0663	9.5460	1	0.0020	-0.0206	0.8146
Smoking status:							
one smoker	0.3000	0.0443	45.8539	1	0.0000	0.0496	1.3499
two or more	0.6277	0.0603	108.5266	1	0.0000	0.0772	1.8733
Constant	-0.5554	0.1909	8.4631	1	0.0036		

Table 6.6.5: Standard symptom ratio for phlegm day or night by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.108	1504	0.113	0.96 (0.81, 1.10)
	Kwai Tsing	2017	0.106	2016	0.115	0.92 (0.80, 1.05)
1990	Southern	1486	0.075	1486	0.081	0.93 (0.75, 1.10)
	Kwai Tsing	2027	0.077	2027	0.081	0.95 (0.80, 1.10)
1991	Southern	4993	0.088	4943	0.091	0.97 (0.88, 1.06)
	Kwai Tsing	4785	0.083	4719	0.092	0.90 (0.81, 0.99)
1992	Southern	5605	0.097	5539	0.091	1.07 (0.98, 1.16)
	Kwai Tsing	5137	0.099	5059	0.089	1.11 (1.02, 1.21)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.3233	0.0193	281.8972	1	0.0000	-0.1290	0.7238
Gender	0.2926	0.0427	46.8736	1	0.0000	0.0517	1.3399
School session	0.2234	0.0424	27.7379	1	0.0000	0.0391	1.2504
Housing type	-0.0460	0.0440	1.0921	1	0.2960	0.0000	0.9551
Education:							
primary	-0.1868	0.0615	9.2329	1	0.0024	-0.0207	0.8296
secondary	-0.2397	0.0632	14.3923	1	0.0001	-0.0272	0.7868
post-secondary	-0.3831	0.0691	30.7569	1	0.0000	-0.0414	0.6817
Smoking status:							
one smoker	0.3151	0.0464	46.0945	1	0.0000	0.0512	1.3704
two or more	0.6894	0.0622	122.7147	1	0.0000	0.0847	1.9926
Constant	0.7684	0.2041	14.1802	1	0.0002		

Table 6.6.6: Standard symptom ratio for phlegm for 3 months by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.035	1504	0.070	0.50 (0.36, 0.64)
	Kwai Tsing	2017	0.051	2016	0.070	0.73 (0.59, 0.87)
1990	Southern	1486	0.037	1486	0.056	0.66 (0.49, 0.84)
	Kwai Tsing	2027	0.044	2027	0.055	0.80 (0.63, 0.97)
1991	Southern	4993	0.055	4943	0.058	0.95 (0.84, 1.06)
	Kwai Tsing	4785	0.050	4719	0.059	0.85 (0.74, 0.95)
1992	Southern	5605	0.072	5539	0.058	1.24 (1.12, 1.36)
	Kwai Tsing	5137	0.079	5059	0.058	1.36 (1.23, 1.49)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.2096	0.0226	86.0605	1	0.0000	-0.0827	0.8109
Gender	0.4875	0.0531	84.3493	1	0.0000	0.0818	1.6282
School session	0.0156	0.0522	0.0890	1	0.7654	0.0000	1.0157
Housing type	-0.0313	0.0536	0.3419	1	0.5587	0.0000	0.9692
Education:							
primary	-0.1688	0.0766	4.8558	1	0.0276	-0.0152	0.8447
secondary	-0.1118	0.0775	2.0825	1	0.1490	-0.0026	0.8942
post-secondary	-0.1969	0.0834	5.5741	1	0.0182	-0.0170	0.8213
Smoking status:							
one smoker	0.2903	0.0564	26.5346	1	0.0000	0.0447	1.3368
two or more	0.5573	0.0770	52.3430	1	0.0000	0.0640	1.7459
Constant	-0.9381	0.2436	14.8303	1	0.0001		

Table 6.6.7: Standard symptom ratio for sore throat by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.053	1504	0.128	0.41 (0.32, 0.50)
	Kwai Tsing	2017	0.086	2016	0.133	0.65 (0.55, 0.74)
1990	Southern	1486	0.061	1486	0.110	0.55 (0.44, 0.67)
	Kwai Tsing	2027	0.098	2027	0.114	0.86 (0.74, 0.98)
1991	Southern	4993	0.099	4943	0.115	0.86 (0.78, 0.94)
	Kwai Tsing	4785	0.097	4719	0.118	0.82 (0.75, 0.90)
1992	Southern	5605	0.151	5539	0.116	1.30 (1.21, 1.39)
	Kwai Tsing	5137	0.174	5059	0.118	1.47 (1.38, 1.57)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.1486	0.0162	83.7512	1	0.0000	-0.0642	0.8619
Gender	0.0918	0.0379	5.8686	1	0.0154	0.0140	1.0961
School session	0.0836	0.0382	4.8027	1	0.0284	0.0119	1.0872
Housing type	0.0594	0.0395	2.2651	1	0.1323	0.0037	1.0612
Education:							
primary	-0.2349	0.0559	17.6575	1	0.0000	-0.0281	0.7907
secondary	-0.1139	0.0562	4.1113	1	0.0426	-0.0103	0.8923
post-secondary	-0.2974	0.0618	23.1521	1	0.0000	-0.0327	0.7427
Smoking status:							
one smoker	0.3564	0.0413	74.6207	1	0.0000	0.0605	1.4282
two or more	0.6716	0.0564	141.5893	1	0.0000	0.0839	1.9575
Constant	-0.6518	0.1765	13.6322	1	0.0002		

Table 6.6.8: Standard symptom ratio for nasal symptoms by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.288	1504	0.387	0.74 (0.67, 0.81)
	Kwai Tsing	2017	0.333	2016	0.390	0.85 (0.79, 0.92)
1990	Southern	1486	0.241	1486	0.342	0.70 (0.63, 0.78)
	Kwai Tsing	2027	0.253	2027	0.343	0.74 (0.67, 0.80)
1991	Southern	4993	0.359	4943	0.350	1.03 (0.98, 1.08)
	Kwai Tsing	4785	0.332	4719	0.355	0.94 (0.89, 0.98)
1992	Southern	5605	0.390	5539	0.349	1 12 (1.07, 1.16)
	Kwai Tsing	5137	0.422	5059	0.352	1.20 (1.15, 1.25)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.1696	0.0109	244.2800	1	0.0000	-0.0826	0.8440
Gender	0.3008	0.0257	137.2332	1	0.0000	0.0617	1.3509
School session	0.0490	0.0260	3.5563	1	0.0593	0.0066	1.0502
Housing type	0.0342	0.0267	1.6449	1	0.1997	0.0000	1.0348
Education:							
primary	-0.0507	0.0391	1.6829	1	0.1945	0.0000	0.9505
secondary	0.0165	0.0397	0.1717	1	0.6786	0.0000	1.0166
post-secondary	-0.0904	0.0422	4.5945	1	0.0321	-0.0085	0.9136
Smoking status:							
one smoker	0.1896	0.0278	46.4345	1	0.0000	0.0354	1.2088
two or more	0.4066	0.0418	94.6825	1	0.0000	0.0511	1.5017
Constant	0.8691	0.1191	53.2090	1	0.0000		

Table 6.6.9: Standard symptom ratio for wheezing by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.078	1504	0.110	0.71 (0.58, 0.84)
	Kwai Tsing	2017	0.106	2016	0.104	1.02 (0.88, 1.16)
1990	Southern	1486	0.094	1486	0.096	0.98 (0.82, 1.14)
	Kwai Tsing	2027	0.101	2027	0.092	1.10 (0.95, 1.25)
1991	Southern	4993	0.085	4943	0.095	0.89 (0.81, 0.98)
	Kwai Tsing	4785	0.091	4719	0.095	0.96 (0.87, 1.05)
1992	Southern	5605	0.090	5539	0.095	0.95 (0.86, 1.03)
	Kwai Tsing	5137	0.118	5059	0.095	1.24 (1.14, 1.34)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.1234	0.0176	49.0296	1	0.0000	-0.0521	0.8839
Gender	0.6259	0.0430	211.5505	1	0.0000	0.1100	1.8700
School session	0.1502	0.0417	12.9793	1	0.0003	0.0252	1.1621
Housing type	-0.1260	0.0429	8.6466	1	0.0033	-0.0196	0.8816
Education:							
primary	0.1419	0.0665	4.5576	1	0.0328	0.0122	1.1525
secondary	0.2330	0.0668	12.1658	1	0.0005	0.0242	1.2624
post-secondary	0.2639	0.0695	14.4081	1	0.0001	0.0268	1.3020
Smoking status:							
one smoker	0.1378	0.0453	9.2594	1	0.0023	0.0205	1.1478
two or more	0.3818	0.0640	35.6180	1	0.0000	0.0441	1.4649
Constant	-1.5967	0.1945	67.3972	1	0.0000		

Table 6.6.10: Standard symptom ratio for diagnosed asthma by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.074	1504	0.081	0.91 (0.74, 1.08)
	Kwai Tsing	2017	0.071	2016	0.074	0.96 (0.80, 1.12)
1990	Southern	1486	0.069	1486	0.075	0.92 (0.74, 1.10)
	Kwai Tsing	2027	0.070	2027	0.069	1.01 (0.85, 1.18)
1991	Southern	4993	0.072	4943	0.073	0.99 (0.88, 1.09)
	Kwai Tsing	4785	0.063	4719	0.071	0.89 (0.79, 0.99)
1992	Southern	5605	0.076	5539	0.072	1.06 (0.96, 1.16)
	Kwai Tsing	5137	0.077	5059	0.071	1.08 (0.98, 1.19)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.0676	0.0199	11.5815	1	0.0007	-0.0260	0.9347
Gender	0.7898	0.0504	245.1096	1	0.0000	0.1310	2.2029
School session	0.2323	0.0474	23.9969	1	0.0000	0.0394	1.2615
Housing type	-0.1184	0.0489	5.8653	1	0.0154	-0.0165	0.8884
Education:							
primary	0.1117	0.0759	2.1640	1	0.1413	0.0034	1.1182
secondary	0.1672	0.0765	4.7749	1	0.0289	0.0140	1.1820
post-secondary	0.3112	0.0781	15.8693	1	0.0001	0.0313	1.3651
Smoking status:							
one smoker	-0.1028	0.0521	3.8842	1	0.0487	-0.0115	0.9023
two or more	0.0140	0.0776	0.0326	1	0.8567	0.0000	1.0141
Constant	-2.4923	0.2210	127.1777	1.	0.0000		

Table 6.6.11: Standard symptom ratio for diagnosed allergic rhinitus by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.137	1504	0.177	0.77 (0.67, 0.88)
	Kwai Tsing	2017	0.127	2016	0.166	0.77 (0.67, 0.86)
1990	Southern	1486	0.164	1486	0.175	0.94 (0.82, 1.05)
	Kwai Tsing	2027	0.145	2027	0.166	0.87 (0.77, 0.97)
1991	Southern	4993	0.167	4943	0.168	0.99 (0.93, 1.06)
	Kwai Tsing	4785	0.148	4719	0.168	0.88 (0.82, 0.95)
1992	Southern	5605	0.190	5539	0.166	1.14 (1.08, 1.21)
	Kwai Tsing	5137	0.197	5059	0.168	1.17 (1.10, 1.24)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.0118	0.0136	0.7545	1	0.3850	0.0000	0.9882
Gender	0.4148	0.0331	156.6520	1	0.0000	0.0791	1.5140
School session	0.1019	0.0331	9.4731	1	0.0021	0.0174	1.1072
Housing type	0.0353	0.0340	1.0755	1	0.2997	0.0000	1.0359
Education:							
primary	0.1613	0.0545	8.7670	1	0.0031	0.0165	1.1751
secondary	0.4150	0.0540	59.0227	1	0.0000	0.0480	1.5143
post-secondary	0.5602	0.0556	101.6526	1	0.0000	0.0635	1.7510
Smoking status:							
one smoker	-0.1289	0.0358	12.9823	1	0.0003	-0.0211	0.8791
two or more	-0.2195	0.0572	14.7073	1	0.0001	-0.0227	0.8029
Constant	-2.0133	0.1527	173.9019	1	0.0000		

Table 6.6.12: Standard symptom ratio for diagnosed sinusitis by district and by survey year

Survey year	District	Actual value		Predicted value		SSR (95% CI)
		Valid N	Prevalence	Valid N	Prevalence	
1989	Southern	1504	0.015	1504	0.023	0.65 (0.38, 0.92)
	Kwai Tsing	2017	0.016	2016	0.022	0.73 (0.48, 0.98)
1990	Southern	1486	0.013	1486	0.022	0.59 (0.33, 0.85)
	Kwai Tsing	2027	0.014	2027	0.022	0.64 (0.40, 0.87)
1991	Southern	4993	0.020	4943	0.021	0.95 (0.77, 1.14)
	Kwai Tsing	4785	0.023	4719	0.022	1.05 (0.85, 1.24)
1992	Southern	5605	0.025	5539	0.021	1.19 (0.99, 1.39)
	Kwai Tsing	5137	0.027	5059	0.022	1.23 (1.02, 1.43)

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Age	-0.0220	0.0348	0.4001	1	0.5270	0.0000	0.9782
Gender	0.5871	0.0877	44.7983	1	0.0000	0.0867	1.7988
School session	-0.0275	0.0853	0.1040	1	0.7471	0.0000	0.9729
Housing type	0.1175	0.0878	1.7929	1	0.1806	0.0000	1.1247
Education:							
primary	0.2676	0.1417	3.5688	1	0.0589	0.0166	1.3068
secondary	0.3112	0.1435	4.7035	1	0.0301	0.0218	1.3650
post-secondary	0.5354	0.1451	13.6121	1	0.0002	0.0452	1.7081
Smoking status:							
one smoker	-0.0048	0.0925	0.0027	1	0.9589	0.0000	0.9952
two or more	0.2443	0.1296	3.5505	1	0.0595	0.0165	1.2767
Constant	-4.3231	0.3930	121.0375	1	0.0000		

Table 7.1.1: Models for analysing symptom prevalence by primary classes

Survey year	Class available	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
1989	3	3	3	3	3	3	
1989	4	4	4		4		4
1990	4	4	4	4			4
1990	5	5	5				
1991	3	3				3	
1991	4	4					4
1991	5		5	5			
1991	6		6				
1992	3					3	
1992	4	4					4
1992	5	5					
1992	6			6			

Table 7.2.1: Respiratory symptom model 1: morning cough

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.31	(0.65)	0.05	(0.55)
District	0.10	(0.10)	0.11	(0.08)
PM session	0.05	(0.10)	0.13	(0.08)
Year - 2nd	-0.00	(0.11)	0.08	(0.09)
Sex - male	0.44***	(0.10)	0.34***	(0.08)
Age	-0.24**	(0.07)	-0.24***	(0.06)
No. smoker types:				
1	0.03	(0.10)	0.47***	(0.09)
2-4	0.55***	(0.14)	0.65***	(0.12)
Public housing	0.07	(0.11)	0.16	(0.09)
Father eduction:				
Primary	-0.09	(0.14)	-0.28#	(0.13)
Lower secondary	-0.10	(0.15)	-0.25#	(0.12)
Upper secondary	-0.34#	(0.17)	-0.43*	(0.14)
Post secondary	-0.38	(0.26)	-0.28	(0.23)

Within-subject correlation: 0.148 0.139

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.2: Respiratory symptom model 1: evening cough

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.21	(0.65)	0.78	(0.56)
District	0.18	(0.11)	-0.00	(0.09)
PM session	0.32*	(0.10)	-0.01	(0.09)
Year - 2nd	-0.10	(0.11)	0.12	(0.09)
Sex - male	0.34**	(0.10)	0.30**	(0.08)
Age	-0.27***	(0.07)	-0.31***	(0.06)
No. smoker types:				
1	0.22#	(0.11)	0.40***	(0.09)
2-4	0.59***	(0.14)	0.71***	(0.12)
Public housing	0.05	(0.11)	0.13	(0.09)
Father eduction:				
Primary	-0.15	(0.15)	-0.20	(0.13)
Lower secondary	-0.10	(0.15)	-0.28#	(0.13)
Upper secondary	-0.35#	(0.18)	-0.29#	(0.14)
Post secondary	-0.49	(0.31)	-0.33	(0.22)

Within-subject correlation: 0.171 0.167

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.3: Respiratory symptom model 1: cough for 3 months

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.29#	(0.98)	-0.86	(0.68)
District	0.45*	(0.17)	0.07	(0.11)
PM session	0.26	(0.15)	-0.14	(0.12)
Year - 2nd	0.03	(0.17)	0.22	(0.13)
Sex - male	0.50*	(0.16)	0.39**	(0.11)
Age	-0.19#	(0.10)	-0.23*	(0.07)
No. smoker types:				
1	0.14	(0.16)	0.03	(0.12)
2-4	0.44#	(0.22)	0.46*	(0.16)
Public housing	-0.18	(0.16)	0.08	(0.12)
Father eduction:				
Primary	0.07	(0.25)	-0.18	(0.18)
Lower secondary	0.20	(0.26)	0.07	(0.18)
Upper secondary	-0.22	(0.30)	-0.07	(0.19)
Post secondary	-0.31	(0.45)	0.01	(0.29)

Within-subject correlation: 0.089 0.107

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.4: Respiratory symptom model 1: morning phlegm

Variable	1989/90 Log-Odds-Ratio	(S.E.)	1991/92 Log-Odds-Ratio	(S.E.)
(Intercept)	-1.30*	(0.54)	-0.47	(0.63)
District	0.10	(0.09)	0.08	(0.10)
PM session	0.20*	(0.09)	0.18#	(0.09)
Year - 2nd	-0.20*	(0.10)	0.12	(0.10)
Sex - male	0.18*	(0.09)	0.20#	(0.09)
Age	-0.11*	(0.05)	-0.22**	(0.06)
No. smoker types:				
1	0.34**	(0.09)	0.33**	(0.10)
2-4	0.63***	(0.12)	0.58***	(0.13)
Public housing	0.03	(0.10)	0.15	(0.10)
Father eduction:				
Primary	-0.02	(0.13)	-0.17	(0.14)
Lower secondary	-0.08	(0.14)	-0.17	(0.15)
Upper secondary	-0.11	(0.15)	-0.10	(0.15)
Post secondary	0.12	(0.22)	-0.18	(0.24)

Within-subject correlation: 0.145 0.166

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.5: Respiratory symptom model 1: phelgm day or night

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.59	(0.62)	0.50	(0.61)
District	-0.04	(0.10)	0.01	(0.10)
PM session	0.29*	(0.09)	0.15	(0.09)
Year - 2nd	-0.10	(0.11)	0.07	(0.10)
Sex - male	0.39***	(0.09)	0.35**	(0.09)
Age	-0.22**	(0.06)	-0.32***	(0.06)
No. smoker types:				
1	0.39***	(0.10)	0.31*	(0.10)
2-4	0.76***	(0.13)	0.59***	(0.13)
Public housing	0.05	(0.10)	0.15	(0.10)
Father eduction:				
Primary	-0.09	(0.14)	-0.30#	(0.15)
Lower secondary	-0.13	(0.15)	-0.12	(0.15)
Upper secondary	-0.16	(0.17)	-0.19	(0.16)
Post secondary	0.09	(0.24)	-0.10	(0.24)

Within-subject correlation: 0.103 0.123

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.6: Respiratory symptom model 1: phelgm for 3 months

Variable	1989/90 Log-Odds-Ratio	(S.E.)	1991/92 Log-Odds-Ratio	(S.E.)
(Intercept)	-2.17*	(0.84)	-1.16	(0.69)
District	0.23	(0.14)	0.06	(0.11)
PM session	0.17	(0.13)	-0.07	(0.11)
Year - 2nd	0.17	(0.15)	0.19	(0.12)
Sex - male	0.61***	(0.14)	0.51***	(0.11)
Age	-0.16#	(0.08)	-0.21*	(0.07)
No. smoker types:				
1	0.46*	(0.14)	0.40**	(0.11)
2-4	0.75***	(0.19)	0.56**	(0.16)
Public housing	-0.09	(0.14)	0.11	(0.11)
Father eduction:				
Primary	-0.24	(0.20)	-0.06	(0.17)
Lower secondary	-0.11	(0.21)	-0.03	(0.17)
Upper secondary	-0.28	(0.23)	-0.15	(0.19)
Post secondary	-0.16	(0.35)	-0.18	(0.30)

Within-subject correlation: 0.148 0.109

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.7: Respiratory symptom model 1: sore throat

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.83***	(0.64)	-1.87**	(0.48)
District	0.40**	(0.11)	0.13	(0.09)
PM session	0.24#	(0.10)	0.07	(0.08)
Year - 2nd	0.23#	(0.11)	0.30**	(0.08)
Sex - male	0.27*	(0.10)	0.01	(0.08)
Age	-0.06	(0.06)	-0.04	(0.05)
No. smoker types:				
1	0.38**	(0.11)	0.47***	(0.08)
2-4	0.57***	(0.14)	0.54***	(0.12)
Public housing	0.16	(0.11)	0.10	(0.09)
Father eduction:				
Primary	-0.07	(0.17)	-0.24	(0.13)
Lower secondary	0.28	(0.17)	-0.17	(0.13)
Upper secondary	-0.12	(0.19)	-0.15	(0.14)
Post secondary	-0.35	(0.35)	-0.15	(0.21)

Within-subject correlation: 0.167 0.169

\# : p < 0.05
* : p < 0.01
** : p < 0.001
*** : P < 0.0001

Table 7.2.8: Respiratory symptom model 1: nasal symptoms

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.13	(0.39)	0.40	(0.35)
District	0.13#	(0.06)	0.11	(0.06)
PM session	0.13#	(0.06)	0.01	(0.06)
Year - 2nd	-0.17*	(0.06)	0.27***	(0.06)
Sex - male	0.40***	(0.06)	0.33***	(0.06)
Age	-0.12*	(0.04)	-0.14***	(0.03)
No. smoker types:				
1	0.04	(0.06)	0.27***	(0.06)
2-4	0.29*	(0.09)	0.46***	(0.09)
Public housing	0.12	(0.07)	0.10	(0.06)
Father eduction:				
Primary	0.06	(0.09)	-0.09	(0.09)
Lower secondary	0.08	(0.10)	0.03	(0.09)
Upper secondary	-0.06	(0.11)	0.06	(0.09)
Post secondary	0.23	(0.15)	0.14	(0.15)

Within-subject correlation: 0.260 0.252

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.9: Respiratory symptom model 1: wheezing

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.59***	(0.62)	-1.34#	(0.58)
District	0.30*	(0.11)	0.22#	(0.10)
PM session	0.35**	(0.10)	-0.06	(0.10)
Year - 2nd	0.13	(0.10)	0.17	(0.09)
Sex - male	0.70***	(0.11)	0.65***	(0.10)
Age	-0.07	(0.06)	-0.16*	(0.06)
No. smoker types:				
1	0.10	(0.10)	0.25*	(0.09)
2-4	0.13	(0.15)	0.34#	(0.14)
Public housing	-0.20	(0.10)	-0.08	(0.09)
Father eduction:				
Primary	0.19	(0.16)	0.15	(0.15)
Lower secondary	0.35#	(0.16)	0.30#	(0.14)
Upper secondary	0.22	(0.19)	0.22	(0.16)
Post secondary	1.01***	(0.22)	0.29	(0.23)

Within-subject correlation: 0.367 0.336

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.10: Respiratory symptom model 1: doctor diagnosed asthma

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.29*	(0.73)	-0.69	(0.70)
District	0.12	(0.13)	-0.07	(0.11)
PM session	0.27#	(0.12)	0.10	(0.11)
Year - 2nd	0.06	(0.10)	0.37**	(0.10)
Sex - male	0.88***	(0.13)	0.78***	(0.12)
Age	-0.11	(0.07)	-0.25**	(0.07)
No. smoker types:				
1	-0.09	(0.11)	-0.09	(0.10)
2-4	-0.09	(0.16)	0.04	(0.15)
Public housing	-0.13	(0.12)	0.14	(0.11)
Father eduction:				
Primary	0.13	(0.16)	-0.19	(0.16)
Lower secondary	0.23	(0.17)	0.17	(0.16)
Upper secondary	0.08	(0.19)	0.12	(0.17)
Post secondary	0.80**	(0.24)	0.43	(0.24)

Within-subject correlation: 0.569 0.467

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.11: Respiratory symptom model 1: doctor diagnosed allergic rhinitis

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.39*	(0.52)	-1.84***	(0.44)
District	-0.04	(0.09)	-0.03	(0.08)
PM session	0.12	(0.09)	0.17*	(0.08)
Year - 2nd	0.33***	(0.08)	0.36***	(0.07)
Sex - male	0.56***	(0.09)	0.41***	(0.08)
Age	-0.13*	(0.05)	-0.04	(0.04)
No. smoker types:				
1	-0.15	(0.08)	0.00	(0.07)
2-4	-0.37*	(0.13)	-0.13	(0.12)
Public housing	-0.03	(0.09)	0.11	(0.08)
Father eduction:				
Primary	0.40*	(0.14)	-0.04	(0.11)
Lower secondary	0.66***	(0.14)	0.23#	(0.11)
Upper secondary	0.71***	(0.14)	0.36*	(0.12)
Post secondary	0.87***	(0.20)	0.57**	(0.17)

Within-subject correlation: 0.506 0.436

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.12: Respiratory symptom model 1: doctor diagnosed sinusitis

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-7.37***	(1.31)	-3.68*	(1.19)
District	0.16	(0.25)	-0.24	(0.19)
PM session	-0.15	(0.25)	-0.09	(0.18)
Year - 2nd	-0.44	(0.23)	0.40#	(0.18)
Sex - male	0.70*	(0.27)	0.79***	(0.20)
Age	0.24	(0.12)	-0.11	(0.12)
No. smoker types:				
1	-0.49	(0.25)	0.06	(0.18)
2-4	-0.36	(0.40)	0.42	(0.24)
Public housing	-0.12	(0.26)	0.47#	(0.19)
Father eduction:				
Primary	0.73	(0.48)	0.31	(0.29)
Lower secondary	0.75	(0.54)	0.20	(0.30)
Upper secondary	0.97	(0.53)	0.43	(0.31)
Post secondary	1.44#	(0.59)	1.13	(0.38)

Within-subject correlation: 0.341 0.323

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.2.13: Respiratory symptom model 1: all symptoms, for district effects

	1989/90		1991/92	
Symptoms	Odds-Ratio	(95% CI)	Odds-Ratio	(95% CI)
Morning cough	1.10	(0.90,1.35)	1.11	(0.94,1.31)
Evening cough	1.20	(0.97,1.49)	1.00	(0.84,1.18)
Cough 3 months	1.57	(1.13,2.18)	1.07	(0.85,1.34)
Morning phlegm	1.10	(0.93,1.32)	1.08	(0.89,1.30)
Phlegm day/night	0.96	(0.80,1.16)	1.01	(0.84,1.22)
Phlegm 3 months	1.26	(0.95,1.67)	1.06	(0.86,1.31)
Sore throat	1.49	(1.20,1.85)	1.14	(0.96,1.34)
Nasal symptoms	1.14	(1.00,1.29)	1.12	(0.99,1.26)
Wheezing	1.35	(1.10,1.66)	1.25	(1.04,1.51)
Diagnosed - asthma	1.12	(0.87,1.44)	0.93	(0.75,1.16)
allergic rhinitis	0.97	(0.81,1.15)	0.97	(0.83,1.14)
sinusitis	1.18	(0.72,1.93)	0.78	(0.55,1.13)

Table 7.2.14: Respiratory symptom model 1: all symptoms, for passive smoking effects

Symptoms	(No. of smoker types)	1989/90 Odds-Ratio	1989/90 (95% CI)	1991/92 Odds-Ratio	1991/92 (95% CI)
Morning cough	(1)	1.03	(0.84,1.26)	1.61	(1.35,1.90)
	(2)	1.73	(1.32,2.25)	1.92	(1.50,2.45)
Evening cough	(1)	1.24	(1.01,1.53)	1.49	(1.26,1.77)
	(2)	1.81	(1.37,2.38)	2.03	(1.60,2.57)
Cough 3 months	(1)	1.15	(0.84,1.57)	1.03	(0.81,1.30)
	(2)	1.55	(1.02,2.36)	1.59	(1.15,2.19)
Morning phlegm	(1)	1.40	(1.17,1.67)	1.39	(1.15,1.68)
	(2)	1.88	(1.47,2.40)	1.78	(1.38,2.28)
Phlegm day/night	(1)	1.48	(1.22,1.79)	1.36	(1.12,1.65)
	(2)	2.15	(1.68,2.75)	1.80	(1.39,2.33)
Phlegm 3 months	(1)	1.59	(1.20,2.09)	1.50	(1.20,1.87)
	(2)	2.11	(1.46,3.05)	1.74	(1.27,2.38)
Sore throat	(1)	1.46	(1.18,1.81)	1.59	(1.36,1.87)
	(2)	1.77	(1.34,2.33)	1.71	(1.35,2.16)
Nasal symptoms	(1)	1.04	(0.92,1.18)	1.32	(1.17,1.48)
	(2)	1.33	(1.11,1.60)	1.58	(1.33,1.87)
Wheezing	(1)	1.11	(0.91,1.34)	1.29	(1.07,1.55)
	(2)	1.14	(0.85,1.53)	1.40	(1.07,1.85)
Diagnosed - asthma	(1)	0.92	(0.75,1.13)	0.91	(0.75,1.11)
	(2)	0.92	(0.60,1.27)	1.04	(0.77,1.41)
allergic rhinitis	(1)	0.86	(0.74,1.01)	1.00	(0.87,1.16)
	(2)	0.69	(0.54,0.89)	0.88	(0.70,1.10)
sinusitis	(1)	0.61	(0.37,1.01)	1.06	(0.74,1.51)
	(2)	0.70	(0.32,1.53)	1.52	(0.95,2.43)

Table 7.3.1: Respiratory symptom model 2: morning cough

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.13	0.60
District	0.06	0.09
P.M. session	0.03	0.09
Year 90	0.02	0.11
91	-0.13	0.16
Sex - male	0.49^{***}	0.09
Age	-0.26^{***}	0.06
No. smoker types		
1	0.02	0.09
2-4	0.52^{***}	0.13
Public housing	0.08	0.10
Father education		
Primary	-0.05	0.13
Lower secondary	-0.10	0.14
Upper secondary	-0.28	0.15
Post secondary	-0.40	0.24

Within-subject correlation: 89 - 90: 0.151
89 - 91: 0.094
90 - 91: 0.153

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.2: Respiratory symptom model 2: evening cough

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.24	0.61
District	0.15	0.10
P.M. session	0.28*	0.09
Year 90	-0.05	0.11
91	-0.15	0.17
Sex - male	0.36**	0.10
Age	-0.31***	0.06
No. smoker types		
1	0.17	0.10
2-4	0.53***	0.13
Public housing	0.00	0.10
Father education		
Primary	-0.09	0.13
Lower secondary	-0.04	0.14
Upper secondary	-0.34#	0.16
Post secondary	-0.59#	0.28

Within-subject correlation: 89 - 90: 1.1760
89 - 91: 0.0891
90 - 91: 0.1110

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.3: Respiratory symptom model 2: cough for 3 months

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.77#	0.89
District	0.28	0.15
P.M. session	0.14	0.14
Year 90	0.08	0.16
91	-0.03	0.24
Sex - male	0.46*	0.15
Age	0.23*	0.09
No. smoker types		
1	0.13	0.14
2-4	0.52*	0.20
Public housing	-0.18	0.14
Father education		
Primary	0.18	0.23
Lower secondary	0.26	0.24
Upper secondary	-0.06	0.27
Post secondary	-0.27	0.40

Within-subject correlation: 89 - 90: 0.0949
89 - 91: 0.0770
90 - 91: 0.1136

: p < 0.05
* : p < 0.01
** : p < 0.001
*** : p < 0.0001

Table 7.3.4: Respiratory symptom model 2: morning phlegm

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.35*	0.51
District	0.05	0.08
P.M. session	0.22*	0.08
Year 90	-0.21#	0.09
91	-0.55***	0.13
Sex - male	0.18#	0.08
Age	-0.10#	0.05
No. smoker types		
1	0.33***	0.08
2-4	0.60***	0.11
Public housing	-0.01	0.09
Father education		
Primary	-0.04	0.12
Lower secondary	-0.12	0.12
Upper secondary	-0.12	0.13
Post secondary	-0.04	0.21

Within-subject correlation: 89 - 90: 0.131
89 - 91: 0.131
90 - 91: 0.170

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.5: Respiratory symptom model 2: phlegm day or night

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.53	0.57
District	-0.03	0.09
P.M. session	0.29**	0.08
Year 90	-0.11	0.10
91	-0.45*	0.15
Sex - male	0.36***	0.09
Age	-0.21**	0.06
No. smoker types		
1	0.33**	0.09
2-4	0.73***	0.12
Public housing	-0.00	0.09
Father education		
Primary	-0.12	0.13
Lower secondary	-0.14	0.14
Upper secondary	-0.23	0.15
Post secondary	0.05	0.23

Within-subject correlation: 89 - 90: 0.1041
89 - 91: 0.0816
90 - 91: 0.0999

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.6: Respiratory symptom model 2: phlegm for 3 months

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.41*	0.75
District	0.11	0.13
P.M. session	0.15	0.12
Year 90	0.13	0.14
91	-0.04	0.20
Sex - male	0.54***	0.13
Age	-0.13	0.07
No. smoker types		
1	0.42**	0.12
2-4	0.74***	0.17
Public housing	-0.15	0.13
Father education		
Primary	-0.21	0.18
Lower secondary	-0.05	0.18
Upper secondary	-0.12	0.20
Post secondary	0.15	0.31

Within-subject correlation: 89 - 90: 0.168
89 - 91: 0.063
90 - 91: 0.142

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.7: Respiratory symptom model 2: sore throat

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.82***	0.58
District	0.23*	0.10
P.M. session	0.18#	0.09
Year 90	0.23#	0.11
91	-0.01	0.15
Sex - male	0.31**	0.09
Age	-0.07	0.06
No. smoker types		
1	0.39***	0.09
2-4	0.57***	0.12
Public housing	0.15	0.10
Father education		
Primary	0.10	0.16
Lower secondary	0.36#	0.15
Upper secondary	0.12	0.17
Post secondary	-0.30	0.31

Within-subject correlation: 89 - 90: 0.165
89 - 91: 0.112
90 - 91: 0.176

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.8: Respiratory symptom model 2: nasal symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.16	0.35
District	0.09	0.06
P.M. session	0.11	0.06
Year 90	-0.13#	0.06
91	0.05	0.09
Sex - male	0.40***	0.06
Age	-0.15***	0.03
No. smoker types		
1	0.11#	0.05
2-4	0.30**	0.08
Public housing	0.12#	0.06
Father education		
Primary	0.03	0.08
Lower secondary	0.07	0.09
Upper secondary	-0.04	0.09
Post secondary	0.23	0.14

Within-subject correlation: 89 - 90: 0.256
89 - 91: 0.217
90 - 91: 0.287

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.9: Respiratory symptom model 2: wheezing

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.99**	0.57
District	0.27*	0.10
P.M. session	0.32**	0.10
Year 90	0.18	0.09
91	-0.03	0.14
Sex - male	0.72***	0.10
Age	-0.12#	0.06
No. smoker types		
1	0.10	0.09
2-4	0.25#	0.13
Public housing	-0.24#	0.09
Father education		
Primary	0.14	0.13
Lower secondary	0.23	0.14
Upper secondary	0.10	0.16
Post secondary	0.80***	0.20

Within-subject correlation: 89 - 90: 0.379
89 - 91: 0.295
90 - 91: 0.394

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.10: Respiratory symptom model 2: doctor diagnosed asthma

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.27**	0.67
District	0.14	0.12
P.M. session	0.32*	0.12
Year 90	0.06	0.10
91	0.10	0.15
Sex - male	0.94***	0.13
Age	-0.12	0.07
No. smoker types		
1	-0.08	0.09
2-4	-0.02	0.14
Public housing	-0.14	0.11
Father education		
Primary	0.11	0.13
Lower secondary	0.18	0.14
Upper secondary	0.11	0.16
Post secondary	0.60*	0.23

Within-subject correlation: 89 - 90: 0.596
89 - 91: 0.481
90 - 91: 0.560

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.11: Respiratory symptom model 2: doctor diagnosed allergic rhinitis

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.83	0.47
District	-0.05	0.08
P.M. session	0.21#	0.08
Year 90	0.39***	0.07
91	0.61***	0.11
Sex - male	0.55***	0.08
Age	-0.19***	0.05
No. smoker types		
1	-0.10	0.06
2-4	-0.19	0.11
Public housing	0.05	0.08
Father education		
Primary	0.23#	0.11
Lower secondary	0.51***	0.11
Upper secondary	0.62***	0.12
Post secondary	0.74***	0.17

Within-subject correlation: 89 - 90: 0.503
89 - 91: 0.414
90 - 91: 0.509

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.3.12: Respiratory symptom model 2: doctor diagnosed sinusitis

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-6.64***	1.11
District	0.27	0.22
P.M. session	-0.27	0.23
Year 90	-0.40	0.21
91	-0.40	0.28
Sex - male	0.58#	0.23
Age	0.20	0.10
No. smoker types		
1	-0.36	0.19
2-4	-0.33	0.33
Public housing	-0.21	0.21
Father education		
Primary	0.45	0.34
Lower secondary	0.54	0.38
Upper secondary	0.65	0.39
Post secondary	0.87	0.45

Within-subject correlation: 89 - 90: 0.376
89 - 91: 0 269
90 - 91: 0.278

\# $p < 0.05$
* $p < 0.01$
** $p < 0.001$
*** . $p < 0.0001$

Table 7.3.13: Respiratory symptom model 2: all symptoms for district effects

Symptoms	Odds-Ratio	(95% CI)
Morning cough	1.06	(0.88,1.27)
Evening cough	1.17	(0.96,1.41)
Cough 3 months	1.32	(0.99,1.76)
Morning phlegm	1.05	(0.89,1.24)
Phlegm day/night	0.97	(0.82,1.16)
Phlegm 3 months	1.11	(0.87,1.42)
Sore throat	1.26	(1.05,1.53)
Nasal symptoms	1.10	(0.98,1.23)
Wheezing	1.31	(1.07,1.60)
Diagnosed asthma	1.15	(0.90,1.46)
Diagnosed allergic rhinitis	0.95	(0.81,1.12)
Diagnosed sinusitis	1.32	(0.85,2.04)

Table 7.3.14: Respiratory symptom model 2: all symptoms for intervention effect

	1990		1991	
Symptoms	Odds-Ratio	(95% CI)	Odds-Ratio	(95% CI)
Morning cough	1.02	(0.83,1.26)	0.88	(0.64,1.21)
Evening cough	0.95	(0.76,1.18)	0.86	(0.62,1.20)
Cough 3 months	1.08	(0.79,1.50)	0.97	(0.61,1.56)
Morning phlegm	0.81	(0.68,0.97)	0.58	(0.44,0.75)
Phlegm day/night	0.90	(0.73,1.10)	0.64	(0.48,0.86)
Phlegm 3 months	1.14	(0.86,1.50)	0.96	(0.65,1.42)
Sore throat	1.26	(1.02,1.55)	0.99	(0.74,1.33)
Nasal symptoms	0.87	(0.78,0.99)	1.05	(0.88,1.24)
Wheezing	1.20	(1.00,1.43)	0.97	(0.73,1.28)
Diagnosed asthma	1.06	(0.88,1.28)	1.10	(0.82,1.49)
Diagnosed allergic rhinitis	1.48	(1.28,1.70)	1.84	(1.48,2.29)
Diagnosed sinusitis	0.67	(0.45,1.02)	0.67	(0.39,1.15)

Table 7.3.15: Respiratory symptom model 2: symptoms for district and intervention interaction

	1989		1990		1991	
Symptoms	Odds-Ratio	(95% CI)	Odds Ratio	(95% CI)	Odds Ratio	(95% CI)
Cough 3 months	1.81	(1.19,2.75)	1.32	(0.86,2.04)	0.78	(0.48,1.27)
Morning phlegm	1.24	(1.00,1.54)	0.95	(0.75,1.21)	0.86	(0.64,1.14)
Sore throat	1.51	(1.13,2.01)	1.48	(1.13,1.94)	0.85	(0.64,1.14)
Wheezing	1.58	(1.23,2.02)	1.20	(0.94,1.52)	1.13	(0.86,1.48)

Note: Only models with an interaction effect in any years are presented.

Table 7.4.1: Respiratory symptom model 3: morning cough

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.71#	0.84
District	0.14	0.11
P.M. session	0.07	0.11
Year 90	-0.20	0.15
91	-0.41	0.23
92	-0.28	0.31
Sex - male	0.49***	0.10
Age	-0.09	0.09
No. smoker types		
1	0.07	0.11
2-4	0.52**	0.15
Public housing	0.11	0.12
Father education		
Primary	-0.12	0.17
Lower secondary	-0.10	0 17
Upper secondary	-0.39#	0.20
Post secondary	-0.19	0.28

Within-subject correlation: 89 - 90: 0.1015
89 - 91: 0 0785
89 - 92· 0.0964
90 - 91 0.1416
90 - 92 0.0533
91 - 92 0 1272

. $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.2: Respiratory symptom model 3: evening cough

Variables	Log-Odds-Ratio	(S.E)
(Intercept)	0.27	1 02
District	0.29#	0 13
P.M. session	0 20	0.12
Year 90	0.02	0.17
91	0.08	0.26
92	0.30	0.38
Sex - male	0 38**	0.10
Age	-0.32*	0.11
No. smoker types		
1	0.07	0 12
2-4	0.57**	0.16
Public housing	0.03	0 12
Father education		
Primary	-0.16	0 18
Lower secondary	-0.05	0.18
Upper secondary	-0.35	0.21
Post secondary	-0.29	0.33

Within-subject correlation:
89 - 90: 0.2068
89 - 91: 0.0991
89 - 92: 0 1056
90 - 91: 0.1362
90 - 92: 0.0587
91 - 92: 0.0788

: p < 0.05
* : p < 0.01
** : p < 0.001
*** : p < 0.0001

Table 7.4.3: Respiratory symptom model 3: cough for 3 months

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-4.06*	1.32
District	0.18	0.18
P.M. session	0.15	0.17
Year 90	-0.33	0.24
91	-0.46	0.34
92	-0.41	0.48
Sex - male	0.31#	0.13
Age	0.03	0.14
No. smoker types		
1	-0.05	0.17
2-4	0.56#	0.22
Public housing	-0.21	0.17
Father education		
Primary	0.48	0.32
Lower secondary	0.36	0.32
Upper secondary	0.29	0.35
Post secondary	-0.19	0.50

Within-subject correlation: 89 - 90: 0.1352
89 - 91: 0.0867
89 - 92: 0.0315
90 - 91: 0.1175
90 - 92: 0.0087
91 - 92: 0.0743

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.4: Respiratory symptom model 3: morning phlegm

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.05	0.75
District	0.04	0.11
P.M. session	0.21#	0.10
Year 90	-0.17	0.14
91	-0.43#	0.21
92	-0.03	0.28
Sex - male	0.19	0.10
Age	-0.14	0.08
No. smoker types		
1	0.32*	0.11
2-4	0.61***	0.13
Public housing	-0.05	0.11
Father education		
Primary	-0.04	0.16
Lower secondary	-0.04	0.16
Upper secondary	-0.08	0.18
Post secondary	0.32	0.27

Within-subject correlation: 89 - 90: 0.117
89 - 91: 0.128
89 - 92: 0.102
90 - 91: 0.131
90 - 92: 0.101
91 - 92: 0.167

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.5: Respiratory symptom model 3: phlegm day or night

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.20#	0.93
District	-0.08	0.11
P.M. session	0.17	0.11
Year 90	0.06	0.16
91	-0.28	0.25
92	0.22	0.33
Sex - male	0.33**	0.10
Age	-0.27	0.10
No. smoker types		
1	0.40*	0.11
2-4	0.78**	0.15
Public housing	-0.11	0.11
Father education		
Primary	-0.31	0.16
Lower secondary	-0.21	0.16
Upper secondary	-0.49	0.19
Post secondary	-0.36	0.31

Within-subject correlation: 89 - 90: 0.1243
89 - 91: 0.0598
89 - 92: 0.0716
90 - 91: 0.0634
90 - 92: 0.1050
91 - 92: 0.1304

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.6: Respiratory symptom model 3: phlegm for 3 months

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.78#	1.12
District	0.18	0.16
P.M. session	0.21	0.15
Year 90	0.19	0.21
91	0.08	0.29
92	0.57	0.41
Sex - male	0.48**	0.14
Age	-0.12	0.12
No. smoker types		
1	0.45*	0.15
2-4	0.71**	0.21
Public housing	-0.16	0.16
Father education		
Primary	0.10	0.25
Lower secondary	0.24	0.25
Upper secondary	0.17	0.28
Post secondary	0.18	0.40

Within-subject correlation: 89 - 90: 0.2095
89 - 91: 0.0915
89 - 92: 0.0579
90 - 91: 0.155
90 - 92: 0.130
91 - 92: 0.1712

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.7: Respiratory symptom model 3: sore throat

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-3.09**	0.83
District	0.25#	0.11
P.M. session	0.16	0.11
Year 90	0.17	0.16
91	-0.13	0.23
92	0.48	0.31
Sex - male	0.24#	0.11
Age	0.01	0.09
No. smoker types		
1	0.36*	0.11
2-4	0.69***	0.15
Public housing	0.10	0.11
Father education		
Primary	-0.28	0.17
Lower secondary	0.03	0.17
Upper secondary	-0.25	0.19
Post secondary	-0.30	0.35

Within-subject correlation: 89 - 90: 0.1578
89 - 91: 0.0908
89 - 92: 0.0867
90 - 91: 0.1324
90 - 92: 0.0925
91 - 92: 0.1355

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.8: Respiratory symptom model 3: nasal symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.86	0.57
District	0.15	0.08
P.M. session	0.07	0.08
Year 90	0.06	0.10
91	0.39*	0.15
92	0.84***	0.20
Sex - male	0.36***	0.07
Age	-0.23**	0.06
No. smoker types		
1	0.13	0.07
2-4	0.31*	0.10
Public housing	0.07	0.08
Father education		
Primary	-0.05	0.11
Lower secondary	0.02	0.11
Upper secondary	-0.06	0.12
Post secondary	0.28	0.18

Within-subject correlation: 89 - 90: 0.258
89 - 91: 0.196
89 - 92: 0.156
90 - 91: 0.259
90 - 92: 0.216
91 - 92: 0.260

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.9: Respiratory symptom model 3: wheezing

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.83	1.11
District	0.15	0.13
P.M. session	0.35*	0.13
Year 90	0.56**	0.17
91	0.73*	0.27
92	1.26*	0.39
Sex - male	0.49**	0.14
Age	-0.43**	0.12
No. smoker types		
1	0.02	0.11
2-4	0.23	0.16
Public housing	-0.28#	0.12
Father education		
Primary	0.32	0.20
Lower secondary	0.39#	0.20
Upper secondary	0.12	0.22
Post secondary	0.66#	0.27

Within-subject correlation: 89 - 90: 0.343
89 - 91: 0.260
89 - 92: 0.198
90 - 91: 0.348
90 - 92: 0.265
91 - 92: 0.295

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.10: Respiratory symptom model 3: doctor diagnosed asthma

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.62	1.22
District	0.09	0.16
P.M. session	0.26	0.16
Year 90	0.20	0.18
91	0.34	0.30
92	0.83	0.43
Sex - male	0.53*	0.21
Age	-0.28#	0.13
No. smoker types		
1	-0.05	0.11
2-4	0.04	0.18
Public housing	-0.13	0.14
Father education		
Primary	0.22	0.16
Lower secondary	0.31	0.18
Upper secondary	0.18	0.20
Post secondary	0.42	0.31

Within-subject correlation: 89 - 90: 0.553
89 - 91: 0.457
89 - 92: 0.377
90 - 91: 0.526
90 - 92: 0.443
91 - 92: 0.497

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.11: Respiratory symptom model 3: doctor diagnosed allergic rhinitis

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.73	0.91
District	-0.05	0.11
P.M. session	0.07	0.11
Year 90	0.67***	0.13
91	1.06***	0.22
92	1.69***	0.32
Sex - male	0.40*	0.12
Age	-0.36**	0.10
No. smoker types		
1	-0.05	0.08
2-4	-0.17	0.14
Public housing	-0.01	0.10
Father education		
Primary	0.14	0.13
Lower secondary	0.36#	0.14
Upper secondary	0.47#	0.15
Post secondary	0.77**	0.21

Within-subject correlation: 89 - 90: 0.493
89 - 91: 0.379
89 - 92: 0.288
90 - 91: 0.493
90 - 92: 0.385
91 - 92: 0.435

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.12: Respiratory symptom model 3: doctor diagnosed sinusitis

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-7.49*	2.29
District	0.34	0.31
P.M. session	-0.08	0.32
Year 90	-0.04	0.42
91	-0.17	0.60
92	-0.12	0.85
Sex - male	0.19	0.24
Age	0.22	0.24
No. smoker types		
1	0.11	0.24
2-4	-0.21	0.40
Public housing	-0.21	0.30
Father education		
Primary	0.54	0.49
Lower secondary	0.82	0.51
Upper secondary	1.05	0.55
Post secondary	1.11	0.75

Within-subject correlation: 89 - 90: 0.375
89 - 91: 0.112
89 - 92: 0.146
90 - 91: 0.193
90 - 92: 0.192
91 - 92: 0.307

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.4.13: Respiratory symptom model 3: all symptoms for district effects

Symptoms	Odds-Ratio	(95% CI)
Morning cough	1.15	(0.92,1.44)
Evening cough	1.34	(1.05,1.72)
Cough 3 months	1.19	(0.84,1.69)
Morning phlegm	1.04	(0.84,1.28)
Phlegm day/night	0.92	(0.74,1.15)
Phlegm 3 months	1.20	(0.88,1.64)
Sore throat	1.28	(0.90,1.52)
Nasal symptoms	1.17	(0.79,1.50)
Wheezing	1.17	(1.03,1.60)
Doctor diagnosed asthma	1.08	(1.00,1.35)
Doctor diagnosed allergic rhinitis	0.95	(0.77,1.18)
Doctor diagnosed sinusitis	1.41	(0.77,2.58)

Table 7.5.1: Respiratory symptom model 4: morning cough

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.15	0.87
District	0.17	0.16
P.M. session	0.06	0.16
Sex - male	0.32*	0.12
Age	-0.23*	0.09
No. smoker types		
1	-0.01	0.14
2-4	0.51*	0.16
Public housing	-0.00	0.15
Father education		
Primary	-0.28	0.16
Lower secondary	-0.24	0.19
Upper secondary	-0.55*	0.19
Post secondary	-0.48	0.36

Intra-class correlation: 0.0271

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.2: Respiratory symptom model 4: evening cough

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.48	0.92
District	0.22	0.14
P M. session	0.38*	0.14
Sex - male	0.21	0.12
Age	-0.23#	0.10
No. smoker types		
1	0.10	0.14
2-4	0.57*	0.19
Public housing	0.08	0.15
Father education		
Primary	-0.18	0.21
Lower secondary	-0.15	0.20
Upper secondary	-0.41	0.22
Post secondary	-0.57	0 36

Intra-class correlation: 0 00737

. $p < 0.05$
* . $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.3: Respiratory symptom model 4: cough for 3 months

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.18	1 49
District	0.58	0.20
P.M. session	0.46*	0 20
Sex - male	0.36#	0 24
Age	-0.23	0 16
No. smoker types		
1	0.40#	0.19
2-4	0.55	0 30
Public housing	-0.20	0.22
Father education		
Primary	0.09	0 35
Lower secondary	0.30	0.34
Upper secondary	-0.31	0.39
Post secondary	-0.18	0.57

Intra-class correlation: 0.000271

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.4: Respiratory symptom model 4: morning phlegm

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.23	0.75
District	0.22	0.13
P.M. session	0.22	0.13
Sex - male	0.17	0.11
Age	-0.11	0.08
No. smoker types		
1	0.11	0.11
2-4	0.42*	0.15
Public housing	0.05	0.11
Father education		
Primary	-0.15	0.16
Lower secondary	-0.21	0.17
Upper secondary	-0.19	0.18
Post secondary	-0.12	0.33

Intra-class correlation: 0.0168

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.5: Respiratory symptom model 4: phlegm day or night

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.37	0.94
District	-0.07	0.14
P.M. session	0.33#	0.15
Sex - male	0.37**	0.11
Age	-0.23#	0.09
No. smoker types		
1	0.26#	0.12
2-4	0.59*	0.19
Public housing	0.14	0.11
Father education		
Primary	-0.18	0.17
Lower secondary	-0.26	0.18
Upper secondary	-0.31	0.20
Post secondary	-0.06	0.28

Intra-class correlation: 0.0203

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.6: Respiratory symptom model 4: phlegm for 3 months

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.67#	1.19
District	0.36	0.22
P.M. session	0.10	0.21
Sex - male	0.52*	0.20
Age	-0.11	0.12
No. smoker types		
1	0.45#	0.19
2-4	0.50	0.28
Public housing	-0.19	0.20
Father education		
Primary	-0.19	0.24
Lower secondary	-0.05	0.25
Upper secondary	-0.16	0.27
Post secondary	-0.17	0.43

Intra-class correlation: 0.00991

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.7: Respiratory symptom model 4: sore throat

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-3.63*	0.93
District	0.42#	0.16
P.M. session	0.47**	0.13
Sex - male	0.28#	0.14
Age	0.02	0.10
No. smoker types		
1	0.18	0.15
2-4	0.52#	0.22
Public housing	0.09	0.16
Father education		
Primary	-0.29	0.22
Lower secondary	0.36	0.21
Upper secondary	-0.15	0.24
Post secondary	-0.36	0.45

Intra-class correlation: 0.0109

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.8: Respiratory symptom model 4: nasal symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.37	0.56
District	0.18	0.09
P.M. session	0.03	0.09
Sex - male	0.37***	0.08
Age	-0.09	0.06
No. smoker types		
1	0.03	0.09
2-4	0.34*	0.13
Public housing	0.11	0.09
Father education		
Primary	0.03	0.13
Lower secondary	-0.07	0.13
Upper secondary	-0.12	0.13
Post secondary	0.01	0.20

Intra-class correlation: 0.0126

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.9: Respiratory symptom model 4: wheezing

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.85**	0.80
District	0.41*	0.13
P.M. session	0.27	0.14
Sex - male	0.66***	0.14
Age	-0.04	0.08
No. smoker types		
1	0.18	0.13
2-4	0.16	0.20
Public housing	-0.18	0.13
Father education		
Primary	0.08	0.21
Lower secondary	0.24	0.20
Upper secondary	0.09	0.25
Post secondary	0.75*	0.28

Intra-class correlation: 0.00795

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.10: Respiratory symptom model 4: doctor diagnosed asthma

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.48*	0.90
District	0.07	0.14
P.M. session	0.31#	0.14
Sex - male	0.87***	0.15
Age	-0.09	0.09
No. smoker types		
1	-0.07	0.16
2-4	-0.29	0.27
Public housing	-0.19	0.15
Father education		
Primary	0.20	0.24
Lower secondary	0.24	0.23
Upper secondary	0.13	0.25
Post secondary	0.62#	0.29

Intra-class correlation: 0.00119

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.11: Respiratory symptom model 4: doctor diagnosed allergic rhinitis

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.10*	0.64
District	-0.03	0.13
P.M. session	0.16	0.13
Sex - male	0.62***	0.10
Age	-0.08	0.06
No. smoker types		
1	-0.08	0.11
2-4	-0.48#	0.19
Public housing	-0.05	0.12
Father education		
Primary	0.69**	0.20
Lower secondary	0.80**	0.22
Upper secondary	0.88**	0.23
Post secondary	0.93**	0.28

Intra-class correlation: 0.0134

: p < 0.05
* : p < 0.01
** : p < 0.001
*** : P < 0.0001

Table 7.5.12: Respiratory symptom model 4: doctor diagnosed sinusitis

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-8.86***	1.53
District	0.14	0.33
P.M. session	-0.36	0.33
Sex - male	0.88*	0.32
Age	0.36*	0.14
No. smoker types		
1	-0.60	0.35
2-4	-0.33	0.52
Public housing	-0.01	0.30
Father education		
Primary	0.89	0.59
Lower secondary	0.74	0.58
Upper secondary	1.19#	0.59
Post secondary	1.75#	0.73

Intra-class correlation: 0.00349

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $P < 0.0001$

Table 7.5.13: Respiratory symptom model 4 for all symptoms for district effect

Symptoms	Odds-Ratio	(95% CI)
Morning cough	1.18	(0.87,1.61)
Evening cough	1.24	(0.95,1.63)
Cough 3 months	1.79	(1.21,2.65)
Morning phlegm	1.25	(0.96,1.63)
Phlegm day/night	0.94	(0.70,1.24)
Phlegm 3 months	1.43	(0.93,2.20)
Sore throat	1.52	(1.10,2.10)
Nasal symptoms	1.20	(1.00,1.43)
Wheezing	1.51	(1.17,1.95)
Diagnosed asthma	1.07	(0.82,1.40)
Diagnosed allergic rhinitis	0.98	(0.76,1.25)
Diagnosed sinusitis	1.14	(0.60,2.17)

Intra-class correlation: (0.000 to 0.027)

Table 7.6.1: Respiratory symptom models 5 and 6: morning cough

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.36#	0.68	-0.96	0.80
District	0.11	0.10	0.15	0.09
P.M. session	0.14	0.10	0.11	0.09
Year 90	-	-	0.12	0.13
91	0.38*	0.14	0.50**	0.14
92	0.72***	0.14	0.67***	0.13
Sex - male	0.21#	0.08	0.35***	0.09
Age	-0.12	0.07	-0.20*	0.07
No. smoker types				
1	0.27*	0.08	0.26*	0.10
2-4	0.47***	0.12	0.74***	0.11
Public housing	0.10	0.09	0.21#	0.09
Father education				
Primary	-0.08	0.11	-0.23	0.14
Lower secondary	-0.10	0.12	-0.26	0.15
Upper secondary	-0.30#	0.14	-0.45*	0.16
Post secondary	-0.07	0.23	-0.23	0.23

Intra-class correlation: 0.0205 0.00325

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.2: Respiratory symptom models 5 and 6: evening cough

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.70#	0.78	0.17	0.82
District	-0.07	0.10	0.12	0.10
P.M. session	0.03	0.10	0.19#	0.09
Year 90	-	-	-0.07	0.12
91	0.54***	0.13	0.32#	0.13
92	0.81***	0.14	0.59***	0.12
Sex - male	0.19#	0.09	0.29**	0.08
Age	-0.08	0.08	-0.29**	0.08
No. smoker types				
1	0.30*	0.09	0.33**	0.09
2-4	0.58***	0.11	0.79***	0.13
Public housing	0.14	0.08	0.05	0.10
Father education				
Primary	-0.06	0.14	-0.21	0.16
Lower secondary	-0.06	0.14	-0.28	0.17
Upper secondary	-0.16	0.16	-0.42#	0.18
Post secondary	-0.08	0.21	-0.58#	0.28

Intra-class correlation: 0.0152 0.00908

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.3: Respiratory symptom models 5 and 6: cough for 3 months

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-4.56***	1.00	-2.40#	1.00
District	0.06	0.13	0.19	0.14
P.M. session	0.12	0.14	-0.02	0.13
Year 90	-	-	0.06	0.22
91	0.71**	0.18	0.46#	0.19
92	1.04***	0.18	0.92***	0.18
Sex - male	0.47***	0.12	0.37*	0.14
Age	0.11	0.11	-0.16	0.10
No. smoker types				
1	0.13	0.12	0.02	0.14
2-4	0.38#	0.17	0.35	0.20
Public housing	0.10	0.12	-0.05	0.14
Father education				
Primary	-0.28	0.16	0.05	0.22
Lower secondary	-0.01	0.17	0.31	0.21
Upper secondary	-0.25	0.20	-0.16	0.24
Post secondary	-0.18	0.29	-0.02	0.34

Intra-class correlation: 0.0119 0.00343

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.4: Respiratory symptom models 5 and 6: morning phlegm

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.90#	0.89	-0.39	0.74
District	0.02	0.10	0.20#	0.09
P.M. session	0.14	0.10	0.23*	0.09
Year 90	-	-	-0.19	0.13
91	-0.07	0.13	-0.25	0.14
92	-0.13	0.12	-0.09	0.12
Sex - male	0.11	0.09	0.19#	0.09
Age	-0.06	0.09	-0.20*	0.07
No. smoker types				
1	0.23#	0.09	0.40***	0.09
2-4	0.49**	0.13	0.72***	0.13
Public housing	0.22#	0.10	-0.05	0.09
Father education				
Primary	0.16	0.14	-0.08	0.13
Lower secondary	-0.01	0.14	-0.27	0.14
Upper secondary	0.00	0.16	-0.15	0.14
Post secondary	0.16	0.25	-0.23	0.24

Intra-class correlation: 0.00546 0.00607

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.5: Respiratory symptom models 5 and 6: phlegm day or night

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.49	0.86	0.43	0.81
District	-0.05	0.11	0.06	0.10
P.M. session	0.10	0.11	0.30*	0.10
Year 90	-	-	-0.08	0.13
91	0.14	0.14	-0.21	0.14
92	0.25	0.14	-0.11	0.15
Sex - male	0.29**	0.08	0.34**	0.09
Age	-0.21#	0.09	-0.31***	0.08
No. smoker types				
1	0.19#	0.09	0.36**	0.09
2-4	0.52**	0.14	0.75***	0.14
Public housing	0.13	0.10	-0.03	0.10
Father education				
Primary	0.00	0.14	-0.23	0.14
Lower secondary	-0.11	0.13	-0.10	0.14
Upper secondary	-0.26	0.15	-0.23	0.16
Post secondary	-0.13	0.22	-0.12	0.24

Intra-class correlation: 0.0171 0.00716

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.6: Respiratory symptom models 5 and 6: phlegm for 3 months

Variables	Primary 3 Log-Odds-Ratio	(S.E.)	Primary 4 Log-Odds-Ratio	(S.E.)
(Intercept)	-3.65**	0.98	-1.47	1.05
District	0.08	0.12	0.06	0.12
P.M. session	-0.02	0.13	0.05	0.12
Year 90	-	-	0.12	0.19
91	0.64**	0.18	0.32	0.18
92	0.97***	0.18	0.64**	0.17
Sex - male	0.49***	0.11	0.47***	0.11
Age	0.02	0.10	-0.22#	0.10
No. smoker types				
1	0.12	0.13	0.49***	0.12
2-4	0.31	0.18	0.74***	0.17
Public housing	0.02	0.11	0.09	0.13
Father education				
Primary	-0.10	0.19	-0.14	0.17
Lower secondary	0.02	0.19	-0.09	0.15
Upper secondary	-0.07	0.20	-0.29	0.20
Post secondary	-0.12	0.30	-0.14	0.31

Intra-class correlation: 0.00696 0.00365

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.7: Respiratory symptom models 5 and 6: sore throat

Variables	Primary 3 Log-Odds-Ratio	Primary 3 (S.E.)	Primary 4 Log-Odds-Ratio	Primary 4 (S.E.)
(Intercept)	-4.29***	0.72	-2.84***	0.74
District	-0.01	0.10	0.26*	0.10
P.M. session	0.22#	0.10	0.18#	0.09
Year 90	-	-	0.30#	0.13
91	0.55***	0.12	0.61***	0.14
92	1.13***	0.12	0.93***	0.12
Sex - male	-0.01	0.10	0.09	0.07
Age	0.18#	0.08	-0.03	0.07
No. smoker types				
1	0.26*	0.09	0.42***	0.08
2-4	0.44**	0.12	0.60***	0.13
Public housing	0.09	0.09	0.14	0.09
Father education				
Primary	-0.33*	0.12	-0.18	0.13
Lower secondary	-0.02	0.12	0.05	0.13
Upper secondary	-0.13	0.15	-0.10	0.15
Post secondary	-0.41	0.29	-0.21	0.26

Intra-class correlation: 0.00535 0.0079

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.8: Respiratory symptom models 5 and 6: nasal symptoms

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	0.28	0.55	0.94	0.50
District	0.10	0.08	0.13#	0.06
P.M. session	0.09	0.08	-0.00	0.06
Year 90	-	-	-0.25*	0.09
91	0.32**	0.10	0.30**	0.08
92	0.58***	0.10	0.44***	0.08
Sex - male	0.14#	0.06	0.41***	0.05
Age	-0.17*	0.06	-0.22***	0.05
No. smoker types				
1	0.19*	0.07	0.18*	0.06
2-4	0.38**	0.10	0.37***	0.08
Public housing	0.08	0.07	0.07	0.06
Father education				
Primary	0.08	0.11	-0.02	0.10
Lower secondary	0.06	0.11	0.06	0.09
Upper secondary	0.13	0.12	-0.06	0.10
Post secondary	0.23	0.16	0.05	0.13

Intra-class correlation: 0.0173 0.00701

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.9: Respiratory symptom models 5 and 6: wheezing

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.09#	0.99	-0.02	0.83
District	0.28#	0.12	0.20#	0.10
P.M. session	0.19	0.13	0.16	0.10
Year 90	-	-	0.05	0.14
91	0.16	0.15	0.24	0.13
92	0.25	0.15	0.20	0.13
Sex - male	0.49***	0.11	0.70***	0.08
Age	-0.11	0.10	-0.31***	0.08
No. smoker types				
1	0.13	0.10	0.25*	0.09
2-4	0.35*	0.15	0.31#	0.13
Public housing	-0.04	0.10	-0.11	0.09
Father education				
Primary	0.22	0.18	0.11	0.15
Lower secondary	0.26	0.18	0.31	0.16
Upper secondary	0.16	0.21	0.25	0.16
Post secondary	0.52*	0.25	0.39	0.22

Intra-class correlation: 0.0194 0.0106

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.10: Respiratory symptom models 5 and 6: doctor diagnosed asthma

Variables	Primary 3 Log-Odds-Ratio	Primary 3 (S.E.)	Primary 4 Log-Odds-Ratio	Primary 4 (S.E.)
(Intercept)	-2.55#	1.15	0.26	0.97
District	-0.01	0.12	0.07	0.10
P.M. session	0.21	0.12	0.15	0.10
Year 90	-	-	-0.01	0.14
91	0.11	0.14	0.12	0.14
92	-0.03	0.14	0.36*	0.13
Sex - male	0.76***	0.12	0.74***	0.09
Age	-0.09	0.12	-0.34**	0.09
No. smoker types				
1	0.03	0.13	-0.08	0.10
2-4	0.08	0.19	-0.14	0.17
Public housing	0.04	0.11	-0.14	0.10
Father education				
Primary	0.13	0.22	0.05	0.16
Lower secondary	0.28	0.21	0.22	0.18
Upper secondary	0.37	0.23	0.18	0.19
Post secondary	0.67#	0.29	0.55*	0.21

Intra-class correlation: 0.00315 0.00201

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.11: Respiratory symptom models 5 and 6: doctor diagnosed allergic rhinitis

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.07	0.77	-0.14	0.59
District	-0.07	0.11	-0.04	0.08
P.M. session	-0.03	0.10	0.15	0.08
Year 90	-	-	0.07	0.11
91	0.07	0.13	0.25#	0.12
92	0.43**	0.12	0.33*	0.11
Sex - male	0.28**	0.08	0.49***	0.06
Age	-0.17#	0.09	-0.23***	0.06
No. smoker types				
1	0.01	0.09	-0.09	0.07
2-4	-0.11	0.15	-0.26#	0.12
Public housing	0.11	0.09	-0.04	0.07
Father education				
Primary	0.39*	0.15	0.36*	0.12
Lower secondary	0.42*	0.15	0.57***	0.13
Upper secondary	0.63***	0.15	0.44**	0.13
Post secondary	0.95***	0.20	0.73***	0.17

Intra-class correlation: 0.0162 0.0137

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 7.6.12: Respiratory symptom models 5 and 6: doctor diagnosed sinusitis

	Primary 3		Primary 4	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-7.72***	1.74	-3.69*	1.43
District	0.13	0.22	-0.18	0.17
P.M. session	-0.11	0.22	-0.26	0.17
Year 90	-	-	-0.54#	0.27
91	0.99**	0.29	0.01	0.25
92	0.83*	0.28	0.51#	0.23
Sex - male	0.65*	0.22	0.85***	0.18
Age	0.15	0.17	-0.10	0.14
No. smoker types				
1	0.45	0.26	-0.38	0.20
2-4	0.80#	0.32	0.25	0.24
Public housing	0.33	0.23	0.22	0.18
Father education				
Primary	0.76	0.46	0.55	0.33
Lower secondary	0.60	0.46	0.33	0.35
Upper secondary	1.14#	0.47	0.48	0.35
Post secondary	2.14***	0.52	1.05#	0.41

Intra-class correlation: -0.00165 0.000532

: p < 0.05
* : p < 0.01
** : p < 0.001
*** : p < 0.0001

Table 7.6.13: Respiratory symptom model 5: all symptoms for district effect

Symptoms	Odds-Ratio	(95% CI)
Morning cough	1.11	(0.91,1.36)
Evening cough	0.94	(0.77,1.14)
Cough 3 months	1.06	(0.82,1.37)
Morning phlegm	1.02	(0.83,1.24)
Phlegm day/night	0.95	(0.76,1.19)
Phlegm 3 months	1.08	(0.85,1.37)
Sore throat	0.99	(0.81,1.21)
Nasal symptoms	1.11	(0.96,1.29)
Wheezing	1.32	(1.05,1.67)
Diagnosed asthma	0.99	(0.78,1.25)
Diagnosed allergic rhinitis	0.94	(0.76,1.15)
Diagnosed sinusitis	1.14	(0.74,1.75)

Intra-class correlation: (-0.002 to 0.019)

Table 7.6.14: Respiratory symptom model 6: all symptoms for district effect

Symptoms	Odds-Ratio	(95% CI)
Morning cough	1.16	(0.97,1.38)
Evening cough	1.12	(0.93,1.36)
Cough 3 months	1.21	(0.92,1.58)
Morning phlegm	1.22	(1.01,1.46)
Phlegm day/night	1.06	(0.88,1.29)
Phlegm 3 months	1.06	(0.84,1.34)
Sore throat	1.30	(1.08,1.57)
Nasal symptoms	1.14	(1.01,1.29)
Wheezing	1.22	(1.01,1.48)
Diagnosed asthma	1.07	(0.89,1.29)
Diagnosed allergic rhinitis	0.96	(0.82,1.12)
Diagnosed sinusitis	0.84	(0.60,1.17)

Intra-class correlation: (0.000 to 0.011)

Table 8.1.1: Composite symptom scores for tables 8.2.1 to 8.4.10

	Weighting	Factor analysis			
		Weighting of positive prevalence of each symptom			
Symptom	(1)	(2)	(3)	(4)	(5)
Morning cough	1	0.77	0.09	0.09	-0.00
Evening cough	1	0.78	0.11	0.08	-0.01
Cough for 3 months	1	0.38	0.30	0.29	-0.09
Morning phlegm	1	0.24	0.68	-0.01	0.19
Phlegm day or night	1	0.26	0.71	0.03	0.07
Phlegm for 3 months	1	0.01	0.76	0.15	-0.05
Sore throat	1	0.50	0.27	-0.03	0.10
Nasal symptoms	1	0.42	0.12	0.01	0.56
Wheezing	1	0.11	0.14	0.82	0.07
Diagnosed asthma	1	0.03	-0.00	0.84	0.13
Diagnosed rhinitis	1	0.03	-0.00	0.31	0.67
Diagnosed sinusitis	1	-0.12	0.06	-0.04	0.69
Proportion of variation explained		25%	12%	9.3%	8.5%

Values in columms 2 to 5 are obtained from factor analysis. The four factors account for 55% of the variation.

Table 8.2.1: Factor model 1: any cough or sore throat symptoms

Variable	1989/90 Log-Odds-Ratio	(S.E.)	1991/92 Log-Odds-Ratio	(S.E.)
(Intercept)	-0.01	(0.47)	0.56	(0.40)
District	0.20*	(0.08)	0.04	(0.07)
PM session	0.12	(0.07)	0.02	(0.06)
Year - 2nd	0.04	(0.08)	0.15#	(0.07)
Sex - male	0.31***	(0.07)	0.23**	(0.06)
Age	-0.20***	(0.05)	-0.19***	(0.04)
No. smoker types:				
1	0.19#	(0.08)	0.39***	(0.06)
2-4	0.52***	(0.11)	0.60***	(0.10)
Public housing	0.00	(0.08)	0.10	(0.07)
Father education:				
Primary	-0.03	(0.11)	-0.20#	(0.10)
Lower secondary	-0.00	(0.12)	-0.14	(0.10)
Upper secondary	-0.28#	(0.13)	-0.23#	(0.10)
Post secondary	-0.47#	(0.21)	-0.27	(0.16)

Within-subject correlation: 0.197 0.209

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.2.2: Factor model 1: any phlegm symptoms

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.18	(0.48)	0.41	(0.48)
District	0.11	(0.08)	0.03	(0.07)
PM session	0.16#	(0.07)	0.10	(0.07)
Year - 2nd	-0.11	(0.08)	0.06	(0.08)
Sex - male	0.28**	(0.07)	0.33***	(0.07)
Age	-0.18***	(0.05)	-0.24***	(0.05)
No. smoker types:				
1	0.28**	(0.08)	0.34***	(0.08)
2-4	0.67***	(0.11)	0.53***	(0.11)
Public housing	0.03	(0.08)	0.16#	(0.08)
Father education:				
Primary	-0.07	(0.11)	-0.11	(0.11)
Lower secondary	-0.11	(0.12)	-0.10	(0.11)
Upper secondary	-0.17	(0.13)	-0.09	(0.12)
Post secondary	0.01	(0.19)	-0.05	(0.18)

Within-subject correlation: 0.181 0.178

#	: $p < 0.05$
*	: $p < 0.01$
**	: $p < 0.001$
***	: $p < 0.0001$

Table 8.2.3: Factor model 1: any wheezing or asthmatic symptoms

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-2.01**	(0.59)	-0.79	(0.53)
District	0.24#	(0.10)	0.10	(0.09)
PM session	0.33**	(0.09)	0.01	(0.09)
Year - 2nd	-0.03	(0.09)	0.22*	(0.08)
Sex - male	0.74***	(0.10)	0.71***	(0.09)
Age	-0.08	(0.06)	-0.18**	(0.05)
No. smoker types:				
1	0.02	(0.09)	0.16	(0.08)
2-4	0.11	(0.14)	0.26#	(0.12)
Public housing	-0.18	(0.10)	0.04	(0.09)
Father education:				
Primary	0.13	(0.14)	-0.00	(0.13)
Lower secondary	0.31#	(0.15)	0.22	(0.13)
Upper secondary	0.20	(0.17)	0.21	(0.13)
Post secondary	0.93***	(0.20)	0.34	(0.20)

Within-subject correlation: 0.434 0.4

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.2.4: Factor model 1: any nasal symptoms, allegic rhinitis or sinusitis

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	0.20	(0.38)	0.51	(0.34)
District	0.08	(0.06)	0.08	(0.06)
PM session	0.16#	(0.06)	0.05	(0.06)
Year - 2nd	-0.10	(0.06)	0.31***	(0.05)
Sex - male	0.44***	(0.06)	0.35***	(0.06)
Age	-0.14**	(0.04)	-0.13**	(0.03)
No. smoker types:				
1	0.03	(0.06)	0.23***	(0.06)
2-4	0.17	(0.09)	0.40***	(0.09)
Public housing	0.08	(0.07)	0.11	(0.06)
Father education:				
Primary	0.13	(0.09)	-0.10	(0.08)
Lower secondary	0.24#	(0.10)	0.01	(0.09)
Upper secondary	0.17	(0.10)	0.12	(0.09)
Post secondary	0.38#	(0.15)	0.22	(0.14)

Within-subject correlation: 0.331 0.293

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.2.5: Factor model 1: any symptoms

	1989/90		1991/92	
Variable	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	0.66	(0.40)	1.01*	(0.38)
District	0.14#	(0.07)	0.04	(0.06)
PM session	0.16#	(0.06)	0.00	(0.06)
Year - 2nd	-0.05	(0.06)	0.10	(0.06)
Sex - male	0.47***	(0.06)	0.50***	(0.06)
Age	-0.21***	(0.04)	-0.21***	(0.04)
No. smoker types:				
1	0.15#	(0.06)	0.32***	(0.06)
2-4	0.45***	(0.09)	0.55***	(0.09)
Public housing	-0.03	(0.07)	0.12	(0.06)
Father education:				
Primary	0.03	(0.09)	-0.09	(0.09)
Lower secondary	0.07	(0.10)	-0.00	(0.09)
Upper secondary	-0.04	(0.11)	-0.09	(0.10)
Post secondary	0.17	(0.16)	0.00	(0.15)

Within-subject correlation: 0.3 0.286

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.2.6: Factor model 1: symptoms score for all symptoms

Variable	1989/90 Mean estimate	(S.E.)	1991/92 Mean estimate	(S.E.)
(Intercept)	1.24***	(0.20)	1.98***	(0.22)
District	0.08*	(0.03)	0.04	(0.04)
PM session	0.13**	(0.04)	0.03	(0.04)
Year - 2nd	-0.01	(0.03)	0.10*	(0.03)
Sex - male	0.25***	(0.03)	0.28***	(0.04)
Age	-0.09***	(0.02)	-0.15***	(0.02)
No. smoker types:				
1	0.10*	(0.03)	0.19***	(0.04)
2-4	0.27***	(0.06)	0.35***	(0.06)
Public housing	-0.02	(0.04)	0.07	(0.04)
Father education:				
Primary	-0.01	(0.05)	-0.10	(0.06)
Lower secondary	0.02	(0.05)	-0.04	(0.06)
Upper secondary	-0.07	(0.05)	-0.09	(0.06)
Post secondary	0.12	(0.09)	-0.03	(0.09)

Within-subject correlation: 0.337 0.338

: p < 0.05
* : p < 0.01
** : p < 0.001
*** : p < 0.0001

Table 8.2.7: Factor model 1: symptoms score for cough and sore throat

	1989/90		1991/92	
Variable	Mean estimate	(S.E.)	Mean estimate	(S.E.)
(Intercept)	0.74***	(0.10)	1.11***	(0.12)
District	0.05*	(0.02)	0.03	(0.02)
PM session	0.06**	(0.02)	0.02	(0.02)
Year - 2nd	-0.02	(0.02)	0.07**	(0.02)
Sex - male	0.11***	(0.02)	0.11***	(0.02)
Age	-0.05***	(0.01)	-0.08***	(0.01)
No. smoker types:				
1	0.05*	(0.02)	0.14***	(0.02)
2-4	0.16***	(0.03)	0.23***	(0.03)
Public housing	0.02	(0.02)	0.05#	(0.02)
Father education:				
Primary	-0.01	(0.03)	-0.08#	(0.03)
Lower secondary	0.01	(0.03)	-0.05	(0.03)
Upper secondary	-0.05	(0.03)	-0.07#	(0.03)
Post secondary	-0.01	(0.04)	-0.05	(0.05)
Within-subject correlation:	0.286		0.288	

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.2.8: Factor model 1: symptoms score for phlegm

	1989/90		1991/92	
Variable	Mean estimate	(S.E.)	Mean estimate	(S.E.)
(Intercept)	0.51***	(0.09)	0.76***	(0.09)
District	0.03#	(0.02)	0.02	(0.02)
PM session	0.05**	(0.02)	0.02	(0.02)
Year - 2nd	-0.01	(0.01)	0.04*	(0.01)
Sex - male	0.09***	(0.01)	0.09***	(0.02)
Age	-0.04***	(0.01)	-0.06***	(0.01)
No. smoker types:				
1	0.07***	(0.01)	0.09***	(0.02)
2-4	0.15***	(0.03)	0.16***	(0.03)
Public housing	0.01	(0.02)	0.03#	(0.02)
Father education:				
Primary	-0.01	(0.02)	-0.04	(0.03)
Lower secondary	-0.00	(0.02)	-0.02	(0.03)
Upper secondary	-0.03	(0.03)	-0.03	(0.03)
Post secondary	-0.02	(0.04)	-0.02	(0.04)

Within-subject correlation: 0.255 0.269

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.2.9: Factor model 1: symptoms score for wheezing and asthma

Variable	1989/90 Mean estimate	(S.E.)	1991/92 Mean estimate	(S.E.)
(Intercept)	0.30**	(0.08)	0.51***	(0.08)
District	0.03#	(0.01)	0.01	(0.01)
PM session	0.05*	(0.02)	0.01	(0.02)
Year - 2nd	0.03#	(0.01)	0.06***	(0.01)
Sex - male	0.12***	(0.01)	0.13***	(0.01)
Age	-0.02*	(0.01)	-0.04***	(0.01)
No. smoker types:				
1	0.00	(0.01)	0.03#	(0.01)
2-4	0.01	(0.02)	0.05#	(0.02)
Public housing	-0.02	(0.01)	0.01	(0.01)
Father education:				
Primary	0.02	(0.02)	-0.01	(0.02)
Lower secondary	0.05*	(0.02)	0.03	(0.02)
Upper secondary	0.03	(0.02)	0.02	(0.02)
Post secondary	0.17***	(0.04)	0.06	(0.04)

Within-subject correlation: 0.56 0.497

: p < 0.05
* : p < 0.01
** : p < 0.001
*** : p < 0.0001

Table 8.2.10: Factor model 1: symptoms score for nasal symptoms, allergic rhinitis and sinusitis

	1989/90		1991/92	
Variable	Mean estimate	(S.E.)	Mean estimate	(S.E.)
(Intercept)	0.43***	(0.08)	0.52***	(0.08)
District	0.02	(0.01)	0.01	(0.01)
PM session	0.03#	(0.01)	0.02	(0.01)
Year - 2nd	0.00	(0.01)	0.08***	(0.01)
Sex - male	0.11***	(0.01)	0.11***	(0.01)
Age	-0.03***	(0.01)	-0.03**	(0.01)
No. smoker types:				
1	-0.00	(0.01)	0.05**	(0.01)
2-4	0.02	(0.02)	0.07**	(0.02)
Public housing	0.01	(0.01)	0.04#	(0.01)
Father education:				
Primary	0.04#	(0.02)	-0.01	(0.02)
Lower secondary	0.07**	(0.02)	0.03	(0.02)
Upper secondary	0.05*	(0.02)	0.05#	(0.02)
Post secondary	0.13**	(0.04)	0.11*	(0.04)

Within-subject correlation: 0.465 0.409

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.1: Factor model 2: any cough or sore throat symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.20	0.43
District	0.12	0.07
P.M. session	0.11	0.07
Year 2nd	0.07	0.08
3rd	-0.06	0.11
Sex - male	0.35***	0.07
Age	-0.23***	0.04
No. smoker types		
1	0.20*	0.07
2-4	0.49***	0.09
Public housing	-0.01	0.07
Father education		
Primary	0.05	0.10
Lower secondary	0.06	0.10
Upper secondary	-0.15	0.11
Post secondary	-0.42#	0.19

Within-subject correlation: 89 - 90: 0.194
89 - 91: 0.137
90 - 91: 0.192

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.2: Factor model 2: any phlegm symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.24	0.45
District	0.05	0.07
P.M. session	0.14	0.07
Year 2nd	-0.13	0.08
3rd	-0.47***	0.12
Sex - male	0.30***	0.07
Age	-0.17**	0.04
No. smoker types		
1	0.28***	0.07
2-4	0.66***	0.10
Public housing	0.00	0.08
Father education		
Primary	-0.11	0.10
Lower secondary	-0.14	0.10
Upper secondary	-0.18	0.12
Post secondary	-0.05	0.18

Within-subject correlation: 89 - 90: 0.175
89 - 91: 0.121
90 - 91: 0.198

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.3: Factor model 2: any wheezing or asthmatic symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.65*	0.54
District	0.21#	0.09
P.M. session	0.32**	0.09
Year 2nd	0.00	0.08
3rd	-0.04	0.13
Sex - male	0.80**	0.10
Age	-0.12#	0.05
No. smoker types		
1	0.02	0.08
2-4	0.17	0.12
Public housing	-0.21#	0.09
Father education		
Primary	0.08	0.12
Lower secondary	0.20	0.12
Upper secondary	0.12	0.14
Post secondary	0.72**	0.19

Within-subject correlation: 89 - 90: 0.442
89 - 91: 0.343
90 - 91: 0.458

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.4: Factor model 2: any nasal symptoms, allergic rhinitis, sinusitis

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.50	0.34
District	0.04	0.06
P.M. session	0.15*	0.06
Year 2nd	-0.07	0.06
3rd	0.17#	0.08
Sex - male	0.45***	0.06
Age	-0.17***	0.03
No. smoker types		
1	0.09	0.05
2-4	0.18#	0.08
Public housing	0.11#	0.06
Father education		
Primary	0.05	0.08
Lower secondary	0.20#	0.08
Upper secondary	0.15	0.09
Post secondary	0.33#	0.13

Within-subject correlation: 89 - 90: 0.325
89 - 91: 0.270
90 - 91: 0.364

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.5: Factor model 2: any symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.81#	0.37
District	0.09	0.06
P.M. session	0.16*	0.06
Year 2nd	-0.04	0.06
3rd	-0.18	0.09
Sex - male	0.51***	0.06
Age	-0.22***	0.04
No. smoker types		
1	0.16*	0.06
2-4	0.46***	0.08
Public housing	-0.07	0.06
Father education		
Primary	0.03	0.08
Lower secondary	0.03	0.09
Upper secondary	-0.03	0.10
Post secondary	0.13	0.14

Within-subject correlation: 89 - 90: 0.296
89 - 91: 0.231
90 - 91: 0.316

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.6: Factor model 2: symptoms score for all symptoms

Variables	Mean estimate	(S.E.)
(Intercept)	1.22***	0.17
District	0.05	0.03
P.M. session	0.11**	0.03
Year 2nd	-0.02	0.03
3rd	-0.09#	0.04
Sex - male	0.23***	0.03
Age	-0.08***	0.02
No. smoker types		
1	0.07*	0.03
2-4	0.24***	0.05
Public housing	-0.03	0.03
Father education		
Primary	-0.01	0.04
Lower secondary	0.02	0.04
Upper secondary	-0.05	0.04
Post secondary	0.07	0.07

Within-subject correlation: 89 - 90: 0.384
89 - 91: 0.244
90 - 91: 0.267

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.7: Factor model 2: symptoms score for cough and sore throat

Variables	Mean estimate	(S.E.)
(Intercept)	0.75***	0.08
District	0.03	0.01
P.M. session	0.04*	0.02
Year 2nd	-0.02	0.02
3rd	-0.03	0.02
Sex - male	0.11***	0.01
Age	-0.05***	0.01
No. smoker types		
1	0.04*	0.01
2-4	0.14***	0.02
Public housing	0.02	0.01
Father education		
Primary	0.00	0.02
Lower secondary	0.02	0.02
Upper secondary	-0.03	0.02
Post secondary	-0.01	0.03

Within-subject correlation: 89 - 90: 0.322
89 - 91: 0.216
90 - 91: 0.238

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.8: Factor model 2: symptoms score for phlegm

Variables	Mean estimate	(S.E.)
(Intercept)	0.49***	0.07
District	0.02	0.01
P.M. session	0.04**	0.01
Year 2nd	-0.02	0.01
3rd	-0.05*	0.02
Sex - male	0.07***	0.01
Age	-0.03***	0.01
No. smoker types		
1	0.06***	0.01
2-4	0.13***	0.02
Public housing	-0.00	0.01
Father education		
Primary	-0.01	0.02
Lower secondary	0.00	0.02
Upper secondary	-0.02	0.02
Post secondary	0.01	0.03

Within-subject correlation: 89 - 90: 0.286
89 - 91: 0.175
90 - 91: 0.214

#	: $p < 0.05$
*	: $p < 0.01$
**	: $p < 0.001$
***	: $p < 0.0001$

Table 8.3.9: Factor model 2: symptoms score for wheezing and asthma

Variables	Mean estimate	(S.E.)
(Intercept)	0.35***	0.07
District	0.02	0.01
P.M. session	0.05**	0.01
Year 2nd	0.03*	0.01
3rd	0.02	0.02
Sex - male	0.12***	0.01
Age	-0.03**	0.01
No. smoker types		
1	0.00	0.01
2-4	0.02	0.02
Public housing	-0.02	0.01
Father education		
Primary	0.02	0.01
Lower secondary	0.04*	0.01
Upper secondary	0.02	0.02
Post secondary	0.12**	0.03

Within-subject correlation: 89 - 90: 0.609
89 - 91: 0.437
90 - 91: 0.535

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.3.10: Factor model 2: symptoms score for nasal symptoms, allergic rhinitis and sinusitis

Variables	Mean estimate	(S.E.)
(Intercept)	0.51***	0.07
District	0.01	0.01
P.M. session	0.04*	0.01
Year 2nd	0.01	0.01
3rd	0.04#	0.02
Sex - male	0.11***	0.01
Age	-0.03***	0.01
No. smoker types		
1	0.01	0.01
2-4	0.03	0.02
Public housing	0.01	0.01
Father education		
Primary	0.02	0.01
Lower secondary	0.05*	0.01
Upper secondary	0.04*	0.02
Post secondary	0.10**	0.03

Within-subject correlation: 89 - 90: 0.469
89 - 91: 0.379
90 - 91: 0.475

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.1: Factor model 3: any cough or sore throat symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.08	0.67
District	0.20#	0.09
P.M. session	0.09	0.09
Year 2nd	-0.09	0.11
3rd	-0.29	0.17
4th	-0.02	0.24
Sex - male	0.38***	0.08
Age	-0.07	0.07
No. smoker types		
1	0.12	0.08
2-4	0.54***	0.11
Public housing	-0.01	0.09
Father education		
Primary	-0.14	0.13
Lower secondary	-0.04	0.13
Upper secondary	-0.30#	0.15
Post secondary	-0.35	0.23

Within-subject correlation: 89 - 90: 0.219
89 - 91: 0.137
89 - 92: 0.120
90 - 91: 0.207
90 - 92: 0.120
91 - 92: 0.151

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.2: Factor model 3: any phlegm symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.56	0.68
District	0.04	0.09
P.M. session	0.12	0.09
Year 2nd	-0.10	0.12
3rd	-0.49*	0.19
4th	-0.14	0.25
Sex - male	0.29*	0.10
Age	-0.13	0.07
No. smoker types		
1	0.27*	0.09
2-4	0.64***	0.12
Public housing	-0.02	0.10
Father education		
Primary	-0.10	0.13
Lower secondary	-0.06	0.13
Upper secondary	-0.22	0.15
Post secondary	0.03	0.23

Within-subject correlation: 89 - 90: 0.198
89 - 91: 0.124
89 - 92: 0.131
90 - 91: 0.171
90 - 92: 0.152
91 - 92: 0.189

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.3: Factor model 3: any wheezing or asthmatic symptoms

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	0.28	0.97
District	0.13	0.12
P.M. session	0.30#	0.12
Year 2nd	0.23	0.15
3rd	0.39	0.24
4th	0.88#	0.35
Sex - male	0.52**	0.15
Age	-0.32*	0.11
No. smoker types		
1	-0.05	0.10
2-4	0.14#	0.14
Public housing	-0.24	0.12
Father education		
Primary	0.21	0.16
Lower secondary	0.30	0.17
Upper secondary	0.08	0.19
Post secondary	0.52	0.25

Within-subject correlation: 89 - 90: 0.428
89 - 91: 0.318
89 - 92: 0.245
90 - 91: 0.405
90 - 92: 0.333
91 - 92: 0.361

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.4: Factor model 3: any nasal symptoms, allergic rhinitis, sinusitis

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	1.33	0.59
District	0.11	0.08
P.M. session	0.08#	0.08
Year 2nd	0.15	0.10
3rd	0.53	0.15
4th	1.01#	0.21
Sex - male	0.40**	0.07
Age	-0.26*	0.06
No. smoker types		
1	0.11	0.06
2-4	0.26**	0.10
Public housing	0.06	0.08
Father education		
Primary	-0.03#	0.10
Lower secondary	0.10	0.11
Upper secondary	0.08	0.12
Post secondary	0.04#	0.17

Within-subject correlation:
89 - 90: 0.325
89 - 91: 0.248
89 - 92: 0.203
90 - 91: 0.335
90 - 92: 0.280
91 - 92: 0.317

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.5: Factor model 3: any symptoms

Variables		Log-Odds-Ratio	(S.E.)
(Intercept)		1.30#	0.60
District		0.05	0.08
P.M. session		0.11	0.08
Year	2nd	0.06	0.10
	3rd	-0.04	0.15
	4th	0.36	0.22
Sex - male		0.47***	0.08
Age		-0.26***	0.06
No. smoker types			
	1	0.13	0.07
	2-4	0.46***	0.10
Public housing		-0.04	0.08
Father education			
	Primary	0.00	0.11
	Lower secondary	0.07	0.11
	Upper secondary	-0.10	0.13
	Post secondary	-0.04	0.19

Within-subject correlation: 89 - 90: 0.300
89 - 91: 0.207
89 - 92: 0.173
90 - 91: 0.278
90 - 92: 0.208
91 - 92: 0.257

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.6: Factor model 3: symptoms score for all symptoms

Variables	Mean estimate	(S.E.)
(Intercept)	1.43***	0.25
District	0.05	0.04
P.M. session	0.11#	0.04
Year 2nd	0.00	0.05
3rd	-0.04	0.06
4th	0.13	0.09
Sex - male	0.22***	0.04
Age	-0.11***	0.03
No. smoker types		
1	0.07#	0.04
2-4	0.29***	0.06
Public housing	-0.05	0.04
Father education		
Primary	0.00	0.05
Lower secondary	0.04	0.05
Upper secondary	-0.05	0.06
Post secondary	0.04	0.10

Within-subject correlation: 89 - 90: 0.363
89 - 91: 0.246
89 - 92: 0.249
90 - 91: 0.260
90 - 92: 0.234
91 - 92: 0.260

\# : $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.7: Factor model 3: symptoms score for cough and sore throat

Variables		Mean estimate	(S.E.)
(Intercept)		0.77***	0.14
District		0.05#	0.02
P.M. session		0.04	0.02
Year	2nd	-0.01	0.02
	3rd	-0.01	0.04
	4th	0.09	0.05
Sex - male		0.11***	0.02
Age		-0.05**	0.01
No. smoker types			
	1	0.05#	0.02
	2-4	0.17***	0.03
Public housing		0.01	0.02
Father education			
	Primary	-0.03	0.03
	Lower secondary	-0.00	0.03
	Upper secondary	-0.06	0.03
	Post secondary	-0.01	0.05

Within-subject correlation:
89 - 90: 0.305
89 - 91: 0.201
89 - 92: 0.182
90 - 91: 0.229
90 - 92: 0.179
91 - 92: 0.198

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.8: Factor model 3: symptoms score for phlegm

Variables	Mean estimate	(S.E.)
(Intercept)	0.55***	0.11
District	0.02	0.02
P.M. session	0.04#	0.02
Year 2nd	-0.00	0.02
3rd	-0.03	0.03
4th	0.06	0.04
Sex - male	0.08***	0.02
Age	-0.04*	0.01
No. smoker types		
1	0.06***	0.02
2-4	0.16***	0.03
Public housing	-0.02	0.02
Father education		
Primary	-0.02	0.02
Lower secondary	0.00	0.03
Upper secondary	-0.03	0.03
Post secondary	0.01	0.05

Within-subject correlation: 89 - 90: 0.279
89 - 91: 0.158
89 - 92: 0.187
90 - 91: 0.197
90 - 92: 0.201
91 - 92: 0.225

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.9: Factor model 3: symptoms score for wheezing and asthma

Variables		Mean estimate	(S.E.)
(Intercept)		0.60***	0.11
District		0.02	0.02
P.M. session		0.04#	0.02
Year	2nd	0.06**	0.02
	3rd	0.09**	0.03
	4th	0.17***	0.04
Sex - male		0.10***	0.02
Age		-0.05***	0.01
No. smoker types			
	1	0.00	0.01
	2-4	0.03	0.02
Public housing		-0.03	0.02
Father education			
	Primary	0.03	0.02
	Lower secondary	0.05*	0.02
	Upper secondary	0.03	0.02
	Post secondary	0.09#	0.04

Within-subject correlation:
89 - 90: 0.568
89 - 91: 0.430
89 - 92: 0.373
90 - 91: 0.498
90 - 92: 0.439
91 - 92: 0.459

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 8.4.10: Factor model 3: symptoms score for nasal symptoms, allergic rhinitis and sinusitis

Variables	Mean estimate	(S.E.)
(Intercept)	0.71***	0.12
District	0.01	0.02
P.M. session	0.02	0.02
Year 2nd	0.06*	0.02
3rd	0.12***	0.03
4th	0.24***	0.04
Sex - male	0.10***	0.02
Age	-0.06***	0.01
No. smoker types		
1	0.02	0.01
2-4	0.04#	0.02
Public housing	0.00	0.02
Father education		
Primary	0.00	0.02
Lower secondary	0.04#	0.02
Upper secondary	0.03	0.02
Post secondary	0.12*	0.04

Within-subject correlation: 89 - 90: 0.437
89 - 91: 0.321
89 - 92: 0.277
90 - 91: 0.412
90 - 92: 0.386
91 - 92: 0.438

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.3.1: Samples sizes for Tables 9.3.2 to 9.3.13 by school, by primary grade, by district and by survey year

		Southern					Kwai Tsing		
		Survey year					Survey year		
School	Primary grade	1990	1991	1992	School	Primary grade	1990	1991	1992
13	4	56	56	39	22	4	41	37	28
	5	55	41	56		5	52	36	18
	6		54	49		6		51	14
16	4	57	57	61	25	4	56	49	66
	5	54	50	48		5	52	50	44
	6		44	50		6		54	51

Table 9.3.2: Prevalence of $PD_{20} < 7.79$ by school, by primary grade, by district and by survey year

		Southern					Kwai Tsing		
		Survey year					Survey year		
School	Primary grade	1990	1991	1992	School	Primary grade	1990	1991	1992
13	4	0.179	0.161	0.128	22	4	0.268	0.270	0.071
	5	0.255	0.122	0.161		5	0.385	0.139	0.333
	6		0.148	0.122		6		0.118	0.071
16	4	0.281	0.298	0.131	25	4	0.286	0.367	0.227
	5	0.259	0.160	0.125		5	0.231	0.280	0.136
	6		0.114	0.140		6		0.241	0.157

Table 9.3.3: Prevalence of $PD_{20} < 3.19$ by school, by primary grade, by district and by survey year

		Southern					Kwai Tsing		
		Survey year					Survey year		
School	Primary grade	1990	1991	1992	School	Primary grade	1990	1991	1992
13	4	0.036	0.071	0.051	22	4	0.122	0.135	0.036
	5	0.109	0.098	0.107		5	0.173	0.111	0.222
	6		0.111	0.061		6		0.059	0.071
16	4	0.018	0.281	0.033	25	4	0.125	0.143	0.152
	5	0.056	0.060	0.083		5	0.096	0.180	0.023
	6		0.068	0.040		6		0.056	0.098

Table 9.3.4: PD_{20} by district and by survey year

		Survey year					
District	PD_{20}	1990		1991		1992	
Southern		n	%	n	%	n	%
	< 0.10						
	0.10 - 0.79	5	2.3	9	3.0	6	2.0
	0.80 - 3.19	7	3.2	27	8.9	13	4.3
	3.20 - 7.79	42	18.9	16	5.3	22	7.3
	≥ 7.80	168	75.7	250	82.8	262	86.5
Kwai Tsing	< 0.10			1	0.4	2	0.9
	0.10 - 0.79	6	3.0	5	1.8	3	1.4
	0.80 - 3.19	20	10.0	25	9.0	17	7.7
	3.20 - 7.79	33	16.4	35	12.6	16	7.2
	≥ 7.80	142	70.6	211	76.2	183	82.8
Total		423		579		524	

Table 9.3.5: Distribution of study group PD_{20} categories (μmol histamine) by gender, by district and by survey year

		Southern						Kwai Tsing					
		Survey year						Survey year					
		1990		1991		1992		1990		1991		1992	
PD_{20}	Gender	n	%	n	%	n	%	n	%	n	%	n	%
< 0.10	Boys	0	0.0	0	0.0	0	0.0	0	0.0	1	0.7	1	0.9
0.10 - 0.79		1	0.9	6	3.6	4	2.5	5	4.7	3	2.1	3	2.8
0.80 - 3.19		4	3.4	17	10.2	8	4.9	15	11.3	15	10.3	10	9.2
3.20 - 7.79		23	19.8	11	6.6	18	11.1	23	21.7	17	11.6	10	9.2
≥ 7.80		88	75.9	133	79.6	132	81.5	66	62.3	110	75.3	85	78.0
< 0.10	Girls	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.9
0.10 - 0.79		4	3.8	3	2.3	2	1.4	1	1.1	2	1.6	0	0.0
0.80 - 3.19		3	2.8	8	6.1	5	3.5	8	8.4	9	7.0	7	6.3
3.20 - 7.79		19	17.9	5	3.8	4	2.8	10	10.5	18	14.0	6	5.4
≥ 7.80		80	75.5	115	87.8	130	92.2	76	80.0	100	77.5	98	87.5

Table 9.3.6: Distribution of study group PD_{20} categories (μmol histamine) by age, by district and by survey year

		Southern						Kwai Tsing					
		Survey year						Survey year					
		1990		1991		1992		1990		1991		1992	
PD_{20}	Age (years)	n	%	n	%	n	%	n	%	n	%	n	%
< 0.10	8.0 - 10.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	4.4
0.10 - 0.79		0	0.0	2	4.3	0	0.0	0	0.0	1	2.0	1	2.2
0.80 - 3.19		1	2.2	9	19.6	0	0.0	5	13.9	4	8.0	3	6.7
3.20 - 7.79		13	28.3	2	4.3	2	4.8	5	13.9	12	24.0	4	8.9
≥ 7.80		32	69.6	33	71.7	40	95.2	26	72.2	33	66.0	35	77.8
< 0.10	10.1 - 11.00	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
0.10 - 0.79		0	0.0	2	2.2	2	2.3	4	4.5	2	2.5	1	1.3
0.80 - 3.19		5	5.7	9	9.7	6	6.9	9	10.2	9	11.4	5	6.6
3.20 - 7.79		17	19.3	7	7.5	5	5.7	14	15.9	7	8.9	7	9.2
≥ 7.80		66	75.0	75	80.6	74	85.1	61	69.3	61	77.2	63	82.9
< 0.10	≥11.1	0	0.0	0	0.0	0	0.0	0	0.0	1	0.7	0	0.0
0.10 - 0.79		5	5.7	5	3.1	4	2.3	2	2.6	2	1.4	1	1.0
0.80 - 3.19		1	1.1	9	5.5	7	4.0	6	7.8	12	8.1	9	9.0
3.20 - 7.79		12	13.6	7	4.3	15	8.6	14	18.2	16	10.8	5	5.0
≥ 7.80		70	79.5	142	87.1	148	85.1	55	71.4	117	79.1	85	85.0

Table 9.3.7: Distribution of study group PD20 categories (μmol histamine) by wheezing and asthmatic status, by district and by survey year

		Southern						Kwai Tsing					
		Survey year						Survey year					
		1990		1991		1992		1990		1991		1992	
PD_{20}	Status	n	%	n	%	n	%	n	%	n	%	n	%
< 0.10	Non asthmatic/ non wheezer	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0
0.10 - 0.79		3	1.4	4	1.5	3	1.1	3	1.7	2	0.8	1	0.5
0.80 - 3.19		5	2.4	20	7.4	10	3.6	16	9.0	19	7.5	9	4.7
3.20 - 7.79		39	18.4	12	4.4	20	7.1	30	16.9	30	11.9	12	6.3
≥ 7.80		165	77.8	236	86.8	247	88.2	129	72.5	200	79.4	168	88.4
< 0.10	Asthmatic/ wheezer	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	6.5
0.10 - 0.79		2	20.0	5	16.7	3	13.0	3	13.0	3	12.0	2	6.5
0.80 - 3.19		2	20.0	7	23 3	3	13.0	4	17.4	6	24.0	8	25.8
3.20 - 7.79		3	30.0	4	13.3	2	8.7	3	13.0	5	20.0	4	12.9
≥ 7.80		3	30.0	14	46.7	15	65.2	13	56.5	11	44.0	15	48.4

Table 9.3.8: Mean BR slope by school, by primary grade, by district and by survey year

		Southern					Kwai Tsing		
		Survey year					Survey year		
School	Primary grade	1990	1991	1992	School	Primary grade	1990	1991	1992
13	4	0.397	0.394	0.325	22	4	0.500	0.485	0.323
	5	0.451	0.409	0.396		5	0.543	0.398	0.480
	6		0.409	0.344		6		0.397	0.346
16	4	0.434	0.505	0.333	25	4	0.516	0.526	0.496
	5	0.488	0.416	0.355		5	0.471	0.490	0.369
	6		0.380	0.356		6		0.405	0.390

Table 9.3.9: Mean BR slope by district, by gender and by survey year

	Southern			Kwai Tsing		
	Survey year			Survey year		
Gender	1990	1991	1992	1990	1991	1992
Boys	0.448	0.472	0.403	0.568	0.470	0.487
Girls	0.436	0.348	0.296	0.442	0.423	0.342

Table 9.3.10: Mean BR slope by district, by age and by survey year

	Southern			Kwai Tsing		
	Survey year			Survey year		
Age group	1990	1991	1992	1990	1991	1992
≤ 10.0	0.438	0.526	0.250	0.536	0.474	0.489
10.1 - 11.0	0.436	0.406	0.370	0.524	0.455	0.389
≥ 11.1	0.450	0.401	0.369	0.477	0.440	0.398

Table 9.3.11: Mean BR slope by district, by family smoking status and by survey year

	Southern			Kwai Tsing		
	Survey year			Survey year		
Family smoking status	1990	1991	1992	1990	1991	1992
No smokers	0.422	0.418	0.329	0.523	0.498	0.371
1 smoker	0.480	0.447	0.360	0.507	0.422	0.471
2 or more smokers	0.405	0.376	0.416	0.469	0.354	0.398

Table 9.3.12: Mean BR slope by wheezing and asthmatic status, by district and by survey year

	Southern			Kwai Tsing		
	Survey year			Survey year		
Status	1990	1991	1992	1990	1991	1992
Asthmatic/wheezer	0.890	0.808	0.629	0.722	0.708	0.790
Non asthmatic/non wheezer	0.421	0.379	0.330	0.480	0.425	0.352

Table 9.4.1: Models for analysing histamine responses by primary classes

Survey year	Class available	Model 1	Model 2	Model 3	Model 4
1990	4	4	4	4	4
1990	5	5			
1991	4			4	4
1991	5		5	5	
1991	6				
1992	4				4
1992	5			5	
1992	6		6		

Table 9.5.1: Histamine model 1, all children: BR slope

Variables	Mean estimate	(S.E.)
(Intercept)	0.38#	0.15
District	0.05	0.03
P.M. session	0.02	0.02
Sex - male	0.06	0.03
Age	0.00	0.01
No. smoker types		
1	0.03	0.04
2-4	-0.02	0.05
Public housing	-0.02	0.04
Father education		
Primary	-0.01	0.04
Lower secondary	0.03	0.05
Upper & post secondary	0.02	0.06

Intra-class correlation: -0.0256

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.5.2: Histamine model 1, all children: regression coefficient

Variables	Mean estimate (10^{-2})	(S.E.)
(Intercept)	0.85	1.89
District	-0.52#	0.26
P.M. session	-0.03	0.22
Sex - male	-0.58	0.31
Age	-0.25	0.15
No. smoker types		
1	-0.26	0.30
2-4	0.20	0.47
Public housing	0.18	0.40
Father education		
Primary	0.38	0.44
Lower secondary	-0.22	0.64
Upper & post secondary	0.16	0.61

Intra-class correlation: -0.021

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.5.3: Histamine model 1, all children: BHR of slight, mild, moderate or severe

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.52	1.30
District	0.18	0.15
P.M. session	0.10	0.14
Sex - male	0.42	0.29
Age	0.01	0.09
No. smoker types		
1	0.40	0.30
2-4	-0.02	0.39
Public housing	-0.29	0.28
Father education		
Primary	0.13	0.35
Lower secondary	0.14	0.36
Upper & Post secondary	-0.14	0.44

Intra-class correlation: -0.0243

Table 9.5.4: Histamine model 1, all children: BHR mild, moderate or severe

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-4.08#	1.90
District	0.92*	0.30
P.M. session	0.04	0.26
Sex - male	0.16	0.35
Age	0.14	0.15
No. smoker types		
1	0.12	0.29
2-4	-0.90	0.68
Public housing	-0.23	0.40
Father education		
Primary	-0.50	0.61
Lower secondary	-0.06	0.53
Upper & Post secondary	-0.42	0.59

Intra-class correlation: -0.0181

Table 9.5.5: Histamine model 1, non-wheezy/non-asthmatic children: BR slope

Variables	Mean estimate	(S.E.)
(Intercept)	0.40*	0.14
District	0.05#	0.03
P.M. session	-0.00	0.02
Sex - male	0.02	0.03
Age	-0.00	0.01
No. smoker types		
1	0.01	0.04
2-4	-0.03	0.04
Public housing	0.01	0.04
Father education		
Primary	0.02	0.03
Lower secondary	0.05	0.04
Upper & Post secondary	0.04	0.04

Intra-class correlation: -0.0255

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.5.6: Histamine model 1, non-wheezy/non-asthmatic children: regression coefficient

Variables	Mean estimate (10^{-2})	(S.E.)
(Intercept)	0.80	1.90
District	-0.47#	0.24
P.M. session	0.15	0.20
Sex - male	-0.20	0.28
Age	-0.22	0.16
No. smoker types		
1	-0.00	0.25
2-4	0.34	0.34
Public housing	-0.07	0.34
Father education		
Primary	-0.01	0.27
Lower secondary	-0.50	0.50
Upper & post secondary	-0.08	0.41

Intra-class correlation: -0.0239

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.5.7: Histamine model 1, non-wheezy/non-asthmatic children: BHR slight, mild moderate or severe

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.76	1.46
District	0.25	0.21
P.M. session	0.12	0.19
Sex - male	0.26	0.31
Age	-0.08	0.12
No. smoker types		
1	0.31	0.32
2-4	-0.03	0.41
Public housing	-0.20	0.32
Father education		
Primary	0.31	0.34
Lower secondary	0.20	0.39
Upper & Post secondary	-0.11	0.46

Intra-class correlation: -0.0148

Table 9.5.8: Histamine model 1, non-wheezy/non-asthmatic children: BHR mild moderate or severe

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-4.76*	1.79
District	1.25***	0.28
P.M. session	-0.22	0.32
Sex - male	-0 21	0.44
Age	0.20	0.14
No. smoker types		
1	-0.19	0.37
2-4	-1.85	1.06
Public housing	0.07	0.48
Father education		
Primary	-0.62	0.67
Lower secondary	-0.08	0.55
Upper & Post secondary	-0.57	0.60

Intra-class correlation: -0.0201

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.6.1: Histamine model 2, all children: BR slope

Variables	Mean estimate	(S.E.)
(Intercept)	0.77#	0.31
District	0.05	0.03
P.M. session	0.00	0.03
Sex - male	0.12**	0.03
Age	-0.05	0.03
Year 91	0.00	0.04
92	0.00	0.07
No. smoker types		
1	0.01	0.03
2-4	0.01	0.05
Public housing	-0.04	0.04
Father education		
Primary	0.13*	0.04
Lower secondary	0.12*	0.04
Upper & post secondary	0.10	0.05

Within-subject correlation: 90-91: 0.326
90-92: 0.082
91-92: 0.163

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.6.2: Histamine model 2, all children: regression coefficient

Variables	Mean estimate (10^{-2})	(S.E.)
(Intercept)	5.43	3.79
District	-0.98#	0.45
P.M. session	0.06	0.44
Sex - male	-1.17#	0.46
Age	0.52	0.37
Year 91	3.93***	0.53
92	4.57***	0.87
No. smoker types		
1	-0.21	0.40
2-4	-0.69	0.80
Public housing	0.32	0.49
Father education		
Primary	-1.25#	0.59
Lower secondary	-0.96	0.57
Upper & post secondary	-1.07	0.63

Within-subject correlation: 90-91: 0.257
90-92: 0.0963
91-92: 0.3471

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.6.3: Histamine model 2, all children: BHR slight, mild, moderate or severe

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.70	2.74
District	0.20	0.28
P.M. session	0.10	0.27
Sex - male	0.72#	0.28
Age	-0.17	0.26
Year 91	-0.35	0.33
92	-0.43	0.57
No. smoker types		
1	0.29	0.25
2-4	-0.12	0.44
Public housing	-0.34	0.30
Father education		
Primary	1.10#	0.50
Lower secondary	1.01#	0.49
Upper & post secondary	0.99	0.54

Within-subject correlation: 90-91: 0.212
90-92: 0.097
91-92: 0.144

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.6.4: Histamine model 2, all children: BHR mild, moderate or severe

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-4.24	3.93
District	0.88#	0.41
P.M. session	0.16	0.41
Sex - male	0.62	0.44
Age	-0.02	0.36
Year 91	0.46	0.43
92	0.06	0.79
No. smoker types		
1	0.00	0.38
2-4	0.45	0.57
Public housing	-0.15	0.43
Father education		
Primary	1.02	0.84
Lower secondary	1.12	0.83
Upper & post secondary	1.09	0.86

Within-subject correlation: 90-91: 0.215
90-92: 0.158
91-92: 0.119

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.7.1: Histamine model 3, all children: BR slope

	1990-91		1991-92	
Variables	Mean estimate	(S.E.)	Mean estimate	(S.E.)
(Intercept)	0.58	0.34	0.54	0.39
District	0.06	0.04	0.05	0.05
P.M. session	0.01	0.04	0.04	0.05
Sex - male	0.10*	0.04	0.07	0.05
Age	-0.03	0.03	-0.02	0.04
Year 2nd	-0.01	0.04	-0.05	0.05
No. smoker types				
1	0.01	0.03	-0.03	0.04
2-4	-0.02	0.06	-0.07	0.06
Public housing	-0.04	0.05	0.05	0.05
Father education				
Primary	0.13#	0.05	0.04	0.05
Lower secondary	0.13#	0.05	0.14#	0.06
Upper & post secondary	0.13#	0.06	0.05	0.06

Within-subject correlation: 0.281 0.236

#	: $p < 0.05$
*	: $p < 0.01$
**	: $p < 0.001$
***	: $p < 0.0001$

Table 9.7.2: Histamine model 3, all children: regression coefficient

Variables	1990-91 Mean estimate	(S.E.)	1991-92 Mean estimate	(S.E.)
(Intercept)	-0.03	0.05	-0.04	0.06
District	-0.01#	0.00	0.00	0.01
P.M. session	0.00	0.00	-0.00	0.01
Sex - male	-0.01#	0.00	-0.00	0.01
Age	0.00	0.00	0.01	0.01
Year 2nd	0.04***	0.01	0.00	0.01
No. smoker types				
1	-0.00	0.00	0.00	0.01
2-4	-0.00	0.01	0.01	0.01
Public housing	0.00	0.01	-0.00	0.01
Father education				
Primary	-0.01#	0.01	-0.01	0.01
Lower secondary	-0.01#	0.01	-0.02#	0.01
Upper & post secondary	-0.01	0.01	-0.01	0.01

Within-subject correlation: 0.233 0.313

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.7.3: Histamine model 3, all children: BHR slight, mild, moderate or severe

	1990-91		1991-92	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-1.50	3.01	0.05	2.52
District	0.31	0.30	0.36	0.30
P.M. session	0.07	0.29	0.11	0.30
Sex - male	0.60#	0.30	0.17	0.30
Age	-0.11	0.28	-0.19	0.24
Year 2nd	-0.40	0.34	-0.37	0.32
No. smoker types				
1	0.36	0.28	-0.36	0.29
2-4	-0.26	0.48	-1.21#	0.50
Public housing	-0.21	0.33	0.29	0.33
Father education				
Primary	1.18#	0.56	0.53	0.47
Lower secondary	1.15#	0.55	0.82	0.46
Upper & post secondary	1.04	0.63	0.85	0.46

Within-subject correlation: 0.188 0.219

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.7.4: Histamine model 3, all children: BHR mild, moderate or severe

	1990-91		1991-92	
Variables	Log-Odds-Ratio	(S.E.)	Log-Odds-Ratio	(S.E.)
(Intercept)	-4.96	4.53	-2.12	2.81
District	1.07#	0.44	-0.31	0.39
P.M. session	0.06	0.42	0.22	0.37
Sex - male	0.67	0.45	0.01	0.36
Age	0.00	0.39	0.00	0.25
Year 2nd	0.52	0.45	-0.58	0.37
No. smoker types				
1	0.06	0.41	-0.50	0.38
2-4	0.02	0.69	-1 05	0.62
Public housing	-0.33	0.49	0.06	0.39
Father education				
Primary	1.65	1.21	0.19	0.63
Lower secondary	1.64	1.21	1.18#	0.58
Upper & post secondary	1.64	1.25	0.57	0.60

Within-subject correlation: 0.128 0.224

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.8.1: Histamine model 4, all children: BR slope

Variables	Mean estimate	(S.E.)
(Intercept)	0.66#	0.28
District	0.09***	0.02
P.M. session	0.05*	0.02
Sex - male	0.12***	0.02
Age	-0.04	0.03
Year 91	0.02	0.03
92	-0.06*	0.04
No. smoker types		
1	0.02	0.02
2-4	-0.06*	0.02
Public housing	0.03	0.03
Father education		
Primary	0.07	0.04
Lower secondary	0.11***	0.03
Upper & post secondary	0.10#	0.04

Intra-class correlation: -0.0248

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.8.2: Histamine model 4, all children: regression coefficient

Variables	Mean estimate (10^{-1})	(S.E.)
(Intercept)	-0.05	0.03
District	-0.01	0.00
P.M. session	-0.00	0.00
Sex - male	-0.01**	0.00
Age	0.00	0.00
Year 91	0.00	0.00
92	0.01*	0.00
No. smoker types		
1	0.04***	0.00
2-4	0.04***	0.00
Public housing	-0.00	0.00
Father education		
Primary	-0.00	0.00
Lower secondary	-0.01	0.00
Upper & post secondary	-0.00	0.01

Intra-class correlation: -0.00685

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.8.3: Histamine model 4, all children: BHR slight, mild, moderate or severe

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-0.07	2.01
District	0.35#	0.14
P.M. session	0.12	0.13
Sex - male	0.32	0.18
Age	-0.20	0.20
Year 91	0.09	0.25
92	-0.74	0.49
No. smoker types		
1	0.09	0.15
2-4	-0.60*	0.19
Public housing	0.16	0.24
Father education		
Primary	0.49	0.40
Lower secondary	0.62	0.34
Upper & post secondary	0.75	0.45

Intra-class correlation: -0.023

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 9.8.4: Histamine model 4, all children: BHR mild, moderate or severe

Variables	Log-Odds-Ratio	(S.E.)
(Intercept)	-4.29	2.49
District	0.43	0.29
P.M. session	0.34	0.26
Sex - male	0.55*	0.19
Age	0.03	0.21
Year 91	0.05	0.32
92	-1.06	0.66
No. smoker types		
1	1.01*	0.33
2-4	0.20	0.35
Public housing	0.08	0.31
Father education		
Primary	0.54	0.51
Lower secondary	1.07#	0.43
Upper & post secondary	0.91	0.46

Intra-class correlation: -0.00528

: $p < 0.05$
* : $p < 0.01$
** : $p < 0.001$
*** : $p < 0.0001$

Table 10.3.1: Attributable risk (%) of subjective respiratory symptoms for living in Kwai Tsing

Symptom groups		1989/90 data estimates	1991/92 data estimates
Cough	morning	9.2	7.7
	evening	12.1	0.0
	for 3 months	26.9	-1.8
Sore throat		21.8	5.9
Any cough or sore throat		11.7	1.2
Phlegm	morning	8.7	2.1
	evening	-1.6	-2.5
	for 3 months	12.5	-1.5
Any phlegm		6.4	-1.0
Wheezing		14.4	7.4
Nasal symptoms		8.4	5.0

Table 10.3.2: Prediction of the number of cases preventable by pollution controls, for any of the respiratory symptoms, in Kwai Tsing children aged 8-11 years, if the proportion of the population at risk is exposed to air pollution similar to that in Kwai Tsing in 1989-1990

Reduction in exposure prevalence	Respiratory problems (any)				
	Cough	Phlegm	Wheezing	Nasal	All
25%	227	120	187	172	270
50%	431	233	352	337	520
75%	616	340	498	497	754
100%	784	441	629	650	973

Note: Symptom prevalence and relative risk derived from 1989/90 data: Population sizes from 1991 census data

Table 10.3.3: Prediction of the number of cases preventable by pollution controls, for any of the respiratory symptoms, in Hong Kong children aged 8-11 years, if the proportion of the population at risk is exposed to air pollution similar to that in Kwai Tsing in 1989-1990

Reduction in exposure prevalence	Respiratory problems (any)				
	Cough	Phlegm	Wheezing	Nasal	All
10%	1229	641	1021	915	1448
20%	2407	1267	1991	1815	2854
30%	3536	1879	2912	2701	4220
40%	4619	2477	3788	3573	5547
50%	5660	3061	4623	4432	6837

Note: Symptom prevalence and relative risk derived from 1989/90 data: Population sizes from 1991 census data

Table 10.3.4: Prediction of the number of cases preventable by pollution controls, for any of the respiratory symptoms, in Kwai Tsing children aged 0-11 years, if the proportion of the population at risk is exposed to air pollution similar to that in Kwai Tsing in 1989-1990

Reduction in exposure prevalence	Respiratory problems (any)				
	Cough	Phlegm	Wheezing	Nasal	All
25%	606	320	500	460	721
50%	1152	623	940	902	1391
75%	1646	908	1332	1327	2017
100%	2096	1179	1681	1373	2601

Note: Symptom prevalence and reliable risk derived from 1989/90 data: Population sizes from 1991 census data

Table 10.3.5: Prediction of the number of cases preventable by pollution controls, for any of the respiratory symptoms, in Hong Kong children aged 0-11 years, if the proportion of the population at risk is exposed to air pollution similar to that in Kwai Tsing in 1989-1990

Reduction in exposure prevalence	Respiratory problems (any)				
	Cough	Phlegm	Wheezing	Nasal	All
10%	3306	1724	2747	2459	3894
20%	6472	3407	5354	4880	7675
30%	9508	5052	7830	7262	11347
40%	12420	6659	10185	9608	14916
50%	15218	8229	12429	11917	18384

Note: Symptom prevalence and relative risk derived from 1989/90 data: Population sizes from 1991 census data

Table 10.3.6: Attributable risk (%) of subjective respiratory symptoms for living with a family who smoke

	1989/90 data estimates			1991/92 data estimates		
	Smoking status			Smoking status		
Symptom group	1	2 or more	1 or more	1	2 or more	1 or more
Cough morning	1.2	7.4	8.6	15.6	8.2	23.8
evening	5.1	8.0	13.0	13.7	8.6	22.3
for 3 months	5.7	5.7	11.4	0.3	6.2	6.6
Sore throat	12 4	6 4	18.8	14 9	5.5	20.4
Any cough or sore throat	5.8	6.2	12.0	12.7	6.8	19.5
Phlegm morning	9.8	8.0	17.8	10.9	5.7	16.6
evening	11.2	8 5	19.7	8.7	6.6	15.3
for 3 months	18.1	9.8	27.9	12.5	5.3	17.8
Any phlegm	8.8	7.9	16.8	11.0	5.3	16.3
Wheezing	2.8	0.7	3.5	9.8	3.8	13.5
Nasal symptoms	1.6	3.2	4.8	8.2	4.4	12.6

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APPENDICES

APPENDIX 1

孩子的姓名：______________

班級：______________

班號：______________

學童健康調查

家庭健康問卷

多謝你願意幫忙我們．
我們是用科學方法抽樣選出你的孩子參加，你的合作對這個調查非常重要．

請填寫你的姓名及你與孩子的關係：
你的姓名：______________
關係：______________

請你盡量準確地完成這份問卷．所有資料，將絕對保密，並只用作醫學研究，如果你想知道多些有關這份問卷，或者有關你的孩子的健康，或者須要我們幫助你填寫問卷，請致電香港大學社會醫學系林姑娘或陳姑娘．（電話：5-8199231；或5-8199299）
(如果監護人不是孩子的父母，男監護人請提供自己的資料於父親項內，女監護人請提供自己的資料於母親項內．)

答問題的方法是：
1. 在合適的答案填上☑
2. 在空位上填上數目或其他適當的文字答案．

例：你是否居住在香港？ 是☑ 否□
你的孩子的年齡是 ____9____ 歲

第一部份 孩子健康問題

喉嚨痛、咳與痰（傷風感冒時喉嚨痛、咳與痰不算）

1. 他有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服（經常即一星期有三天或以上）？ 有□ 沒有□
2. 他有沒有經常在早上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳） 有□ 沒有□
3. 他有沒有經常在晚上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳） 有□ 沒有□
4. 在一年中，他有沒有經常在日間或晚間咳連續三個月或以上？ 有□ 沒有□
5. 在最近十二個月內，他有沒有因經常咳而要看醫生？ 有□ 沒有□
6. 他有沒有經常在早上起床後便要咳痰？ 有□ 沒有□
7. 他有沒有經常在日間或晚上咳痰？ 有□ 沒有□
8. 在一年中他有沒有連續三個月或以上經常有痰？ 有□ 沒有□
9. 在最近十二個月內，他有沒有因經常有痰而要看醫生？ 有□ 沒有□

氣促或呼吸困難

10. 你有沒有發覺他與其他小孩玩耍時有氣促或呼吸困難？ 有□ 沒有□
如果答"沒有"，不用答第11題．
11. 如果答"有"，他的情況是否比同年紀的孩子差？ 是□ 否□

扯哈或哮喘

12. 他的胸部或肺部在呼吸時有沒有試過發出『嗚嗚』聲，『扯哈』聲或『哮喘』聲？ 有☐ 沒有☐
    如果沒有聲，不用答第13至15題．
    如果答有聲：
    13. 這情形通常是在日間還是在晚上出現？ 日間☐ 晚上☐
    14. 最近出現這情形是在幾時之前發生？ ____月____日前
    15. 在最近十二個月內，他有沒有因為這樣而引起氣促或呼吸困難？ 有☐ 沒有☐
16. 他曾否經醫生診斷為患上哮喘病？ 是☐ 否☐
17. 他曾否用過醫生開的哮喘葯？ 有☐ 沒有☐
18. 在最近十二個月內，他有沒有哮喘病發作？ 有☐ 沒有☐

鼻問題

19. 他有沒有經常鼻塞或流鼻水？（經常即一星期有三天或以上；傷風感冒時鼻塞或流鼻水不算） 有☐ 沒有☐
20. 在最近十二個月內，他有沒有因經常鼻塞或流鼻水而要看醫生（經常即一星期有三天或以上；傷風感冒時鼻塞或流鼻水不算）？ 有☐ 沒有☐
21. 他曾否經醫生診斷為患上鼻敏感症？ 是☐ 否☐
22. 他曾否經醫生診斷為患上鼻竇炎？ 是☐ 否☐

其他疾病（無論曾否經醫生証實）

23. 他曾否有皮膚敏感或濕疹？ 有☐ 沒有☐
24. 他曾否有百日咳？ 有☐ 沒有☐
25. 他曾否有痲疹（出痲仔）？ 有☐ 沒有☐
26. 他曾否有耳發炎？ 有☐ 沒有☐
27. 在最近十二個月內，他曾否有傷風或感冒？ 有☐ 沒有☐
28. 在最近十二個月內，他曾否有任何胸肺病，（例如：支氣管炎，肺炎，肺癆病）而要留在家中或在床上一個星期或以上？ 有☐ 沒有☐

第二部份　孩子居住單位

29. 孩子居住的單位是甚麼類型？（請選下列任何一項）
    1 ☐公共屋村
    2 ☐私人樓宇（一家人自住一單位）
    3 ☐私人樓宇（與別家人共住一單位）
    4 ☐居者有其屋
    5 ☐房屋署臨時房屋區，木屋或天台木屋
    6 ☐其他（包括石屋，鄉村屋）

30. 居住單位實用面積有多少？ ________平方英呎
31. 他居住的單位用甚麼燃料？（可選多於一項）
    ☐煤氣
    ☐石油氣
    ☐火水爐
    ☐燒柴
    ☐電爐

32. 有多少人與他同住一單位？

請寫出同住的人數：

兄弟姊妹	:____________人	(不計算孩子自己)
父母	:____________人	
監護人	:____________人	
祖父母,外祖父母	:____________人	
其他親戚	:____________人	
其他朋友或同屋	:____________人	

33. 他在現時的單位居住了多久？ ________年________月

第三部份 父母職業及教育程度

	母親			父親		
	是	否	不知道	是	否	不知道
34. 是否與孩子同住？	☐	☐	☐	☐	☐	☐
35. 現時是否有一份全職的職業？	☐	☐	☐	☐	☐	☐
	1	0	9	1	0	9
36. 甚麼職業？（請說明工作性質及職位）（如果現時沒有職業，請填寫對上一份職業．退休人士請填退休前的職業．如果主要做家務，可填家庭主婦）	________			________		

37. 教育程度是：

父親：（請選一項）	母親：（請選一項）
1 ☐無正式入學	1 ☐無正式入學
2 ☐小學	2 ☐小學
3 ☐初中	3 ☐初中
4 ☐高中	4 ☐高中
5 ☐專上或大學	5 ☐專上或大學

第四部份 父母健康情況

喉嚨痛、咳與痰（傷風感冒時喉嚨痛、咳與痰不算）

	母親			父親		
	有	沒有	不知道	有	沒有	不知道
38. 有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服（經常即一星期有三天或以上）？	☐	☐	☐	☐	☐	☐
39. 有沒有經常在早上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）	☐	☐	☐	☐	☐	☐
40. 有沒有經常在晚上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）	☐	☐	☐	☐	☐	☐
41. 有沒有經常在早上起床後便要咳痰？	☐	☐	☐	☐	☐	☐
42. 有沒有經常在日間或晚上咳痰？	☐	☐	☐	☐	☐	☐
43. 在一年中，有沒有連續三個月或以上經常有痰？	☐	☐	☐	☐	☐	☐
44. 在最近十二個月內，有沒有因咳或痰而要看醫生？	☐	☐	☐	☐	☐	☐

其他疾病

有沒有以下的疾病？（無論曾否經醫生証實）

45. 肺炎	☐	☐	☐	☐	☐	☐
46. 肺結核或肺癆病	☐	☐	☐	☐	☐	☐
47. 慢性支氣管炎	☐	☐	☐	☐	☐	☐
48. 肺氣腫	☐	☐	☐	☐	☐	☐
49. 鼻敏感症	☐	☐	☐	☐	☐	☐
50. 鼻竇炎	☐	☐	☐	☐	☐	☐
51. 哮喘	☐	☐	☐	☐	☐	☐
52. 其他胸肺病	☐	☐	☐	☐	☐	☐
53. 心臟病或心臟問題	☐	☐	☐	☐	☐	☐
54. 血壓高	☐	☐	☐	☐	☐	☐

第五部份　　父母及他人吸煙問題

	母親 有	母親 沒有	母親 不知道	父親 有	父親 沒有	父親 不知道
55. 曾經吸過煙嗎？（曾於一年內每日吸一枝或以上，或一生人曾吸二十包或以上才算是）	□	□	□	□	□	□

如果從未吸過煙，不用答第56至60題．
如果答 " 曾吸過 "

	母親	父親
56. 現在（或最近一個月內）有沒有吸煙？	□ □ □	□ □ □
57. 開始吸煙時的年紀是多少？	____歲	____歲
58. 如果是現在有吸，每日吸多少枝煙？	____枝	____枝
59. 如果已經戒煙,成功戒煙時的年紀是多少？	____歲	____歲
60. 戒煙前，通常每日吸多少枝煙？	____枝	____枝

	母親 有	母親 沒有	母親 不知道	父親 有	父親 沒有	父親 不知道
61. 除了香煙（煙仔）外,曾否吸過其他煙草（如雪茄,熟煙 ，煙斗）？	□	□	□	□	□	□
62. 有沒有聽過 "香港不吸煙日" 這個運動？	□	□	□	□	□	□
63. 如果是吸煙者，在 "不吸煙日" 有沒有停止吸煙？	□	□	□	□	□	□

64. 在與孩子同住的人中，有沒有吸煙者？　　有□　　沒有□
如果答 "有"
65. 請填寫同住的吸煙人數：
兄弟姊妹　　：__________人
父母　　　　：__________人
監護人　　　：__________人
祖父母，外祖母：__________人
其他親戚　　：__________人
其他朋友或同屋：__________人

第六部份　　空氣質素

66. 你認為孩子居住單位室內的空氣好不好？　　好□　　不好□
67. 你認為孩子居住單位室外附近的空氣好不好？　　好□　　不好□
68. 你認為孩子學校的空氣好不好？　　好□　　不好□
69. 你認為孩子居住的地區的空氣好不好？　　好□　　不好□
70. 你認為孩子平日在外遊玩的地方（即家庭和學校以外）空氣好不好？　　好□　　不好□
71. 孩子居住的單位內有沒有燒香燭？　　有□　　沒有□
72. 孩子居住的單位內有沒有點蚊香 (在春、夏時)?　　有□　　沒有□
73. 除了學校和家中，平日他在其他地方的時間（例如街上，公園）多或少？　　多□　　少□

74. 請填寫孩子的住址：______________________________
（如果你不方便填寫詳細地址，請寫上街道，或屋村名稱）
75. 如果方便，請填寫與你聯絡的電話號碼：______________

76. 我們希望將來能夠知道你們家庭的健康情況,你願不願意我們將來與你們聯絡？　　願意□　　不願意□

請你將填好的問卷裝入附上的信封內，封口後交由孩子帶回學校．
十分多謝你幫忙．

孩子的姓名：______________

班級：______________

班號：______________

學童健康調查
家庭健康問卷

多謝你願意幫忙我們．
我們是用科學方法抽樣選出你的孩子參加，你的合作對這個調查非常重要．

請填寫你的姓名及孩子的關係：

你的姓名：____________________

關係：____________________

請你盡量準確地完成這份問卷．所有資料，將絕對保密，並只用作醫學研究，如果你想知道多些有關這問卷，或者有關你的孩子的健康，或者須要我們幫助你填寫問卷，請致電香港大學社會醫學系林姑娘或李姑娘．(電話：8199231；或8199299)
（如果監護人不是孩子的父母，男監護人請提供自已的資料於父親項內，女監護人請提供自已的資料於母親項內．）

答問題的方法是：
1. 在合適的答案填上
2. 在空位上填上數目或其他適當的文字答案．

例：你是否居住在香港？ 是☑ 否☐
你的孩子的年齡是 ___9___ 歲

第一部份

孩子健康問題

平時喉嚨痛、咳與痰 （傷風感冒時喉嚨痛、咳與痰不算）

1. 他有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服（經常即一星期有三天或以上）？ 有☐ 沒有☑
2. 他有沒有經常在早上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳） 有☐ 沒有☑
3. 他有沒有經常在晚上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳） 有☐ 沒有☑
4. 在一年中，他有沒有經常在日間或晚間咳連續三個月或以上？ 有☐ 沒有☑
5. 他有沒有經常在早上起床後便要咳痰？ 有☐ 沒有☑
6. 他有沒有經常在日間或晚上咳痰？ 有☐ 沒有☑
7. 在一年中他有沒有連續三個月或以上經常有痰？ 有☐ 沒有☑

呼吸困難或氣促

8. 你有沒有發覺他與其他小孩玩耍時有氣促或呼吸困難？ 有☐ 沒有☑

   如果答"沒有"，不用答第9題.

   9. 如果答"有"，他的情況是否比同年紀的孩子差？ 是☐ 否☑

扯哈或哮喘

10. 他的胸部或肺部在呼吸時有沒有試過發出『嗚嗚』聲，『扯哈』聲或『哮喘』聲？ 有☐ 沒有☑

    如果沒有聲，不用答第11至13題.

    如果答有聲：

    11. 這情形通常是在日間還是晚上出現？ 日間☐ 晚上☐
    12. 最近出現這情形是在幾時之前發生？ _____月前，或_____日前
    13. 在最近十二個月內，他有沒有因為這樣而引起氣促或呼吸困難？ 有☐ 沒有☑

14. 他曾否經醫生診斷為患上哮喘病？ 有☐ 沒有☑
15. 他曾否用過醫生開的哮喘葯？ 有☐ 沒有☑
16. 在最近十二個月內，他有沒有哮喘病發作？ 有☐ 沒有☑

鼻問題

17. 他有沒有經常鼻塞或流鼻水？（經常即一星期有三天或以上；傷風感冒時鼻塞或流鼻水不算） 有☐ 沒有☑
18. 他曾否經醫生診斷為患上鼻敏感症？ 有☐ 沒有☑
19. 他曾否經醫生診斷為患上鼻竇炎？ 有☐ 沒有☑

其他疾病（無論曾否經醫生証實）

20. 他曾否有皮膚敏感或濕疹？ 有☐ 沒有☑
21. 他曾否有百日咳？ 有☐ 沒有☑
22. 他曾否有痲疹（出痲仔）？ 有☐ 沒有☑
23. 他曾否有耳發炎？ 有☐ 沒有☑
24. 在最近十二個月內，他曾否有傷風或感冒？ 有☐ 沒有☑
25. 在最近十二個月內，他曾否有任何胸肺病，（例如：支氣管炎，肺炎，肺癆病）而要留在家中或在床上一個星期或以上？ 有☐ 沒有☑

第二部份　　孩子居住單位

26. 孩子居住的單位是甚麼類型？（請選下列任何一項）
- ☐公共屋邨
- ☐私人樓宇（一家人自住一單位）
- ☐私人樓宇（與別家人共住一單位）
- ☐居者有其屋
- ☐房屋署臨房屋，木屋或天台木屋
- ☐其他（包括石屋，鄉村屋）

27. 居住單位實用面積有多少？ ＿＿＿＿＿平方英呎
28. 他居住的單位用甚麼燃料？ （可選多於一項）
- ☐煤氣
- ☐石油氣
- ☐火水爐
- ☐燒柴
- ☐電爐

29. 有多少人與他同住一單位？

請寫出同住的人數：
- 兄弟姊妹 ：＿＿＿＿＿人 （不計算孩子自己）
- 父母 ：＿＿＿＿＿人
- 監護人 ：＿＿＿＿＿人
- 祖父母，外祖父母：＿＿＿＿＿人
- 其他親戚 ：＿＿＿＿＿人
- 其他朋友或同屋 ：＿＿＿＿＿人

30. 他在現時的單位居住了多久？ ＿＿＿年＿＿＿月

第三部份　　父母職業及教育程度

	母親 是	母親 否	母親 不知道	父親 是	父親 否	父親 不知道
31. 是否與孩子同住？	☐	☐	☐	☐	☐	☐
32. 現時是否有一份全職的職業？	☐	☐	☐	☐	☐	☐
33. 甚麼職業？（請說明工作性質及職位）（如果現時沒有職業，請填寫對上一份職業．退休人士請填退休前的職業．如果主要做家務，可填家庭主婦）	＿＿＿＿			＿＿＿＿		

34. 教育程度是：

父親：（請選一項）
- ☐無正式入學
- ☐小學
- ☐初中
- ☐高中
- ☐專上或大學

母親：（請選一項）
- ☐無正式入學
- ☐小學
- ☐初中
- ☐高中
- ☐專上或大學

第四部份　　父母健康情況

喉嚨痛、咳與痰　（傷風感冒時喉嚨痛、咳與痰不算）

	母親 有	母親 沒有	母親 不知道	父親 有	父親 沒有	父親 不知道
35. 有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服（經常即一星期有三天或以上）？	☐	☐	☐	☐	☐	☐
36. 有沒有經常在早上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）	☐	☐	☐	☐	☐	☐
37. 有沒有經常在晚上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）	☐	☐	☐	☐	☐	☐
38. 有沒有經常在早上起床後便要咳痰？	☐	☐	☐	☐	☐	☐
39. 他有沒有經常在日間或晚上咳痰？	☐	☐	☐	☐	☐	☐
40. 在一年中他有沒有連續三個月或以上經常有痰？	☐	☐	☐	☐	☐	☐

其他疾病

有沒有以下的疾病？（無論曾否經醫生証實）

	母親 有	母親 沒有	母親 不知道	父親 有	父親 沒有	父親 不知道
41. 肺炎	☐	☐	☐	☐	☐	☐
42. 肺結核或肺癆病	☐	☐	☐	☐	☐	☐
43. 慢性支氣管炎	☐	☐	☐	☐	☐	☐
44. 肺氣腫	☐	☐	☐	☐	☐	☐
45. 鼻敏感症	☐	☐	☐	☐	☐	☐
46. 鼻竇炎	☐	☐	☐	☐	☐	☐
47. 哮喘	☐	☐	☐	☐	☐	☐
48. 其他胸肺病	☐	☐	☐	☐	☐	☐
49. 心臟病或心臟問題	☐	☐	☐	☐	☐	☐
50. 血壓高	☐	☐	☐	☐	☐	☐

第五部份　　父母及他人吸煙問題

	母親 有	母親 沒有	母親 不知道	父親 有	父親 沒有	父親 不知道
51. 曾經吸過煙嗎？（曾於一年內每日吸一枝或以上，或一生人曾吸二十包或以上才算是）	☐	☐	☐	☐	☐	☐

如果你從來沒有吸煙，不用答第 52至56題．
如果答 "曾吸過"

	母親			父親		
52. 現在（或最近一個月內）有沒有吸煙？	☐	☐	☐	☐	☐	☐
53. 開始吸煙時你的年紀是多少？	______歲			______歲		
54. 如果是現在有吸，每天吸多少枝煙？	______枝			______枝		
55. 如果已經戒煙，成功戒煙時的年紀是多少？	______歲			______歲		
56. 戒煙前，通常每日吸多少枝煙？	______枝			______枝		

	母親 有	母親 沒有	母親 不知道	父親 有	父親 沒有	父親 不知道
57. 除了香煙（煙仔）外，曾否吸過其他煙草（如雪茄、熟煙、煙斗）？	☐	☐	☐	☐	☐	☐
58. 有沒有聽過 "香港不吸煙日" 這個運動？	☐	☐	☐	☐	☐	☐
59. 如果是吸煙者，在 "不吸煙日" 有沒有停止吸煙？	☐	☐	☐	☐	☐	☐

60. 在與孩子同住的人中，有沒有吸煙者？ 有☐ 沒有☐

如果答 "有"

61. 請填寫同住的吸煙人數：

兄弟姊妹 :______人
父母 :______人
監護人 :______人
祖父母,外祖父母:______人
其他親戚 :______人
其他朋友或同屋 :______人

第六部份 空氣質素

62. 你認為孩子居住單位室內的空氣好不好？ 好☐ 不好☐
63. 你認為孩子居住單位室外附近的空氣好不好？ 好☐ 不好☐
64. 你認為孩子學校的空氣好不好？ 好☐ 不好☐
65. 你認為孩子居住的地區的空氣好不好？ 好☐ 不好☐
66. 你認為孩子平日在外遊玩的地方 (即家庭和學校以外) 空氣好不好？ 好☐ 不好☐
67. 孩子居住單位內有沒有燒香燭？ 有☐ 沒有☐
68. 孩子居住單位內有沒有點蚊香（在春,夏時）？ 有☐ 沒有☐
69. 除了學校和家中，平日他在其他地方的時間 (例如街上，公園) 多或少？ 多☐ 少☐

70. 請填寫孩子的住址：______________________
(如果你不方便填寫詳細地址，請寫上街道，或屋邨名稱)
71. 如果方便，請填寫與你聯絡的電話號碼：______________

72. 我們希望將來能夠知道你們家庭的健康情況，你願不願意我將來與你們聯絡？ 願意☐ 不願意☐

請你將填好的問卷裝入附上的信封內，封口後交由孩子帶回學校．
十分多謝你幫忙．

學童健康調查
家庭健康問卷

多謝你願意幫忙我們。
我們是用科學方法抽樣選出你的孩子參加，你的合作對這個調查非常重要。

請填寫你的姓名及孩子的關係：
你 的 姓 名：________________

你孩子的姓名：________________

關　　　係：________________

你的孩子出生日期：____年____月____日

你的孩子出生地點：香港☐　　中國大陸☐　　其他地方☐

你的孩子在香港居住年數：________年

請你盡量準確地完成這份問卷。所有資料，將絕對保密，並只用作醫學研究，如果你想知道多些有關這問卷，或者有關你的孩子的健康，或者須要我們幫助你填寫問卷，請致電香港大學社會醫學系。（電話：819 9199）
（如果監護人不是孩子的父母，男監護人請提供自已的資料於父親項內，女監護人請提供自已的資料於母親項內。）

答問題的方法是：
1.在合適的答案塡上☑
2.在空位上塡上數目或其他適當的文字答案。

例：你是否居住在香港？　　是☑　　否☐
你的孩子的年齡是__9__歲

第一部份　　孩子健康問題

平時喉嚨痛、咳與痰（傷風感冒時喉嚨痛、咳與痰不算）。

1. 他有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服（經常即一星期有三天或以上）？　有☐　沒有☐
2. 他有沒有經常在早上咳（經常即一星期有三天或以上）？（淸喉嚨或咳一聲不算咳）　有☐　沒有☐
3. 他有沒有經常在晚上咳（經常即一星期有三天或以上）？（淸喉嚨或咳一聲不算咳）　有☐　沒有☐
4. 在一年中，他有沒有經常在日間或晚間咳連續三個月或以上？　有☐　沒有☐
5. 他有沒有經常在早上起床後便要咳痰？　有☐　沒有☐

6. 他有沒有經常在日間或晚上咳痰？ 有☐ 沒有☐
7. 在一年中他有沒有連續三個月或以上經常有痰？ 有☐ 沒有☐
8. 在過去十二個月內，他有沒有因經常咳或痰而要看醫生？ 有☐ 沒有☐

氣促或呼吸困難

9. 你有沒有發覺他與其他小孩玩耍時有氣促或呼吸困難？ 有☐ 沒有☐
10. 如果答"有"，他的情況是否比同年紀的孩子差？ 是☐ 否☐

扯哈或哮喘

11. 他的胸部或肺部在呼吸時有沒有試過發出『嗚嗚』聲，『扯哈』聲或『哮喘』聲？ 有☐ 沒有☐

如果沒有聲，不用答第12至14題。

如果答有聲：

12. 這情形通常是在日間還是晚上出現？ 日間☐ 晚上☐
13. 最近出現這情形是在幾時之前發生？ ____月前，或____日前
14. 在最近十二個月內，他有沒有因爲這樣而引起氣促或呼吸困難？ 有☐ 沒有☐

15. 他曾否經醫生診斷爲患上哮喘病？ 有☐ 沒有☐
16. 他曾否用過醫生開的哮喘葯？ 有☐ 沒有☐
17. 在最近十二個月內，他有沒有哮喘病發作？ 有☐ 沒有☐

鼻問題

18. 他有沒有經常鼻塞或流鼻水？（經常即一星期有三天或以上；傷風感冒時鼻塞或流鼻水不算） 有☐ 沒有☐
19. 他曾否經醫生診斷爲患上鼻敏感症？ 有☐ 沒有☐
20. 他曾否經醫生診斷爲患上鼻竇炎？ 有☐ 沒有☐

其他疾病（經醫生証實）

21. 他曾否有皮膚敏感或濕疹？ 有☐ 沒有☐
22. 他曾否有痲疹（出麻仔）？ 有☐ 沒有☐
23. 他曾否有耳發炎？ 有☐ 沒有☐
24. 在最近十二個月內，他曾否有傷風或感冒？ 有☐ 沒有☐
25. 在最近十二個月內，他曾否有任何胸肺病，（例如：支氣管炎，肺炎，肺癆病）而要留在家中或在床上一個星期或以上？ 有☐ 沒有☐

第二部份 **孩子居住單位**

26. 孩子居住的單位是甚麼類型？（請選下列任何一項）

☐公共屋村
☐私人樓宇（一家人自住一單位）
☐私人樓宇（與別家人共住一單位）
☐居者有其屋
☐房屋署臨時房屋區，木屋或天台木屋
☐其他（包括石屋，鄉村屋）

27. 居住單位實用面積有多少？ ____________平方英呎

28. 他居住的單位用甚麼燃料？ （可選多於一項）

☐煤氣
☐石油氣
☐火水爐
☐燒柴
☐電爐

29. 有多少人與他同住一單位？
請寫出同住的人數：

兄弟姊妹共 ：________人（不計算孩子自己）
父母/監護人共 ：________人
祖父母，外祖父母共：________人
其他親戚共 ：________人
其他朋友或同屋共 ：________人

30. 他在現時的單位居住了多久？ ______年 ______月

第三部份 父母職業及教育程度

	母親 是	母親 否	母親 不知道	父親 是	父親 否	父親 不知道
31. 是否與孩子同住？	☐	☐	☐	☐	☐	☐
32. 現時是否有一份全職的職業？	☐	☐	☐	☐	☐	☐

33. 甚麼職業？（如果現時沒有職業，請填寫對上一份職業。退休人士請填退休前的職業）

母親	父親
☐家庭主婦	☐沒有一份全職工作
☐專業與行政，如醫生、律師、會計師	☐專業與行政，如醫生、律師、會計師
☐文職，如文員，郵務員，接線生	☐文職，如文員、郵務員、接線生
☐銷售業，如小販，店員、店舖東主	☐銷售業，如小販、店員、店舖東主
☐服務行業，如警察、導遊、理髮師	☐服務行業，如警察、導遊、理髮師
☐製造，運輸與勞工，如司機、包裝	☐製造、運輸與勞工，如司機、包裝
☐其它	☐其它

34. 教育程度是：

母親：（請選一項）	父親：（請選一項）
☐無正式入學	☐無正式入學
☐小學	☐小學
☐初中	☐初中
☐高中	☐高中
☐專上或大學	☐專上或大學

第四部份 **父母健康情況**

喉嚨痛、咳與痰（傷風感冒時喉嚨痛、咳與痰不算）

	母親			父親		
	是	否	不知道	是	否	不知道
35. 有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服（經常即一星期有三天或以上）？	☐	☐	☐	☐	☐	☐
36. 有沒有經常在早上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）	☐	☐	☐	☐	☐	☐
37. 有沒有經常在晚上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）	☐	☐	☐	☐	☐	☐
38. 有沒有經常在早上起床後便要咳痰？	☐	☐	☐	☐	☐	☐
39. 他有沒有經常在日間或晚上咳痰？	☐	☐	☐	☐	☐	☐
40. 在一年中他有沒有連續三個月或以上經常有痰？	☐	☐	☐	☐	☐	☐
41. 在過去十二個月內，有沒有因經常咳或痰而要看醫生？	☐	☐	☐	☐	☐	☐

其他疾病

	母親			父親		
	有	沒有	不知道	有	沒有	不知道
有沒有以下的疾病？（經醫生証實）	☐	☐	☐	☐	☐	☐
42. 肺炎	☐	☐	☐	☐	☐	☐
43. 肺結核或肺癆病	☐	☐	☐	☐	☐	☐
44. 皮膚敏感或濕疹	☐	☐	☐	☐	☐	☐
45. 慢性支氣管炎	☐	☐	☐	☐	☐	☐
46. 肺氣腫	☐	☐	☐	☐	☐	☐
47. 哮喘	☐	☐	☐	☐	☐	☐
48. 其他胸肺病	☐	☐	☐	☐	☐	☐
49. 心臟病或心臟問題	☐	☐	☐	☐	☐	☐
50. 血壓高	☐	☐	☐	☐	☐	☐
51. 鼻敏感症	☐	☐	☐	☐	☐	☐
52. 鼻竇炎	☐	☐	☐	☐	☐	☐

第五部份 **父母及他人吸煙問題**

	母親			父親		
	有	沒有	不知道	有	沒有	不知道
53. 曾經吸過煙嗎？（曾於一年內每日吸一枝或以上，或一生人曾吸二十包或以上才算是）	☐	☐	☐	☐	☐	☐
如果你從來沒有吸煙，不用答第54至58題。						
如果答“曾吸過”：						
54. 現在（或最近一個月內）有沒有吸煙？	☐	☐	☐	☐	☐	☐
55. 開始吸煙時你的年紀是多少？	______歲			______歲		
56. 如果是現在有吸，每天吸多少枝煙？	______枝			______枝		
57. 如果已經戒煙，成功戒煙時的年紀是多少？	______歲			______歲		
58. 戒煙前，通常每日吸多少枝煙？	______枝			______枝		

	母親 是	母親 否	母親 不知道	父親 是	父親 否	父親 不知道
59. 除了香煙（煙仔）外，曾否吸過其他煙草（如雪茄、熟煙、煙斗）？	□	□	□	□	□	□
60. 有沒有聽過"香港不吸煙日"這個運動？	□	□	□	□	□	□
61. 如果是吸煙者，在"不吸煙日"有沒有停止吸煙？	□	□	□	□	□	□

62. 在與孩子同住的人中，有沒有吸煙者？ 有□ 沒有□

如果答"有"

63. 請填寫同住的吸煙人數：

兄弟姊妹共　　：________人

父母/監護人共　：________人

祖父母，外祖父母：________人

其他親戚共　　：________人

其他朋友或同屋共：________人

第六部份　　你對孩子吸煙的看法

63. 你對兒童吸煙的意見如何？

□非常反對　□反對　□無所謂　□贊成　□非常贊成

64. 你對你的孩子吸煙的意見如何？

□非常反對　□反對　□無所謂　□贊成　□非常贊成

65. 你認爲是否需要爲孩子提供反吸煙的健康教育？

□非常需要　□需要　□無所謂　□不需要　□非常不需要

66. 你認爲應該在甚麼地方爲孩子提供反吸煙的健康教育？（可填多項）

□家庭　□學校　□電視　□電台　□報章

□兒童刊物　□其他，請說明：________

第七部份　　空氣質素

67. 你認爲孩子居住單位室內的空氣好不好？　好□　不好□

68. 你認爲孩子居住單位室外附近的空氣好不好？　好□　不好□

69. 你認爲孩子學校的空氣好不好？　好□　不好□

70. 你認爲孩子居住的地區的空氣好不好？　好□　不好□

71. 你認爲孩子平日在外遊玩的地方（即家庭和學校以外）空氣好不好？　好□　不好□

72. 孩子居住單位內有沒有燒香燭？　有□　沒有□

73. 孩子居住單位內有沒有點蚊香（在春，夏時）？　有□　沒有□

74. 除了學校和家中，平日他在其他地方的時間（例如街上，公園）多或少？　多□　少□

75. 請填寫孩子的住址：________________________________

（如果你不方便填寫詳細地址，請寫上街道，或屋村名稱）

76. 電話號碼：________________________________

77. 我們希望將來能夠知道你們家庭的健康情況，你願不願意我們將來繼續與你們聯絡？　願意□　不願意□

請你將填好的問卷交由孩子帶回學校。十分多謝你幫忙。

學童健康調查
家庭健康問卷

多謝你願意幫忙我們。
我們是用科學方法抽樣選出你的孩子參加，你的合作對這個調查非常重要。

請填寫你的姓名及孩子的關係：
你 的 姓 名：________________________

你孩子的姓名：________________________

關　　　係：________________________

你的孩子出生日期：______年______月______日

你的孩子出生地點：香港☐　　中國大陸☐　　其他地方☐

你的孩子在香港居住年數：____________年

請你盡量準確地完成這份問卷。所有資料，將絕對保密，並只用作醫學研究，如果你想知道多些有關這問卷，或者有關你的孩子的健康，或者須要我們幫助你填寫問卷，請致電香港大學社會醫學系。（電話：819 9199）
（如果監護人不是孩子的父母，男監護人請提供自已的資料於父親項內，女監護人請提供自已的資料於母親項內。）

答問題的方法是：
1.在合適的答案填上☑
2.在空位上填上數目或其他適當的文字答案。

例：你是否居住在香港？　是☑　否☐
你的孩子的年齡是＿9＿歲

第一部份　　孩子健康問題

平時喉嚨痛、咳與痰（傷風感冒時喉嚨痛、咳與痰不算）。

1. 他有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服（經常即一星期有三天或以上）？　有☐　沒有☐
2. 他有沒有經常在早上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）　有☐　沒有☐
3. 他有沒有經常在晚上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）　有☐　沒有☐
4. 在一年中，他有沒有經常在日間或晚間咳連續三個月或以上？　有☐　沒有☐
5. 他有沒有經常在早上起床後便要咳痰？　有☐　沒有☐

6. 他有沒有經常在日間或晚上咳痰？ 有☐ 沒有☐
7. 在一年中他有沒有連續三個月或以上經常有痰？ 有☐ 沒有☐
8. 在過去十二個月內，他有沒有因經常咳或痰而要看醫生？ 有☐ 沒有☐

氣促或呼吸困難

9. 你有沒有發覺他與其他小孩玩耍時有氣促或呼吸困難？ 有☐ 沒有☐
10. 如果答“有”，他的情況是否比同年紀的孩子差？ 是☐ 否☐

扯哈或哮喘

11. 他的胸部或肺部在呼吸時有沒有試過發出『嗚嗚』聲，『扯哈』聲或『哮喘』聲？ 有☐ 沒有☐
    如果沒有聲，不用答第12至14題。
    如果答有聲：
    12. 這情形通常是在日間還是晚上出現？ 日間☐ 晚上☐
    13. 最近出現這情形是在幾時之前發生？
        （只可選下列任何一項）
        在七日內 ☐
        二至四星期前 ☐
        二至三個月前 ☐
        四至五個月前 ☐
        六個月前或以上☐
    14. 在最近十二個月內，他有沒有因爲這樣而引起氣促或呼吸困難？ 有☐ 沒有☐
15. 他曾否經醫生診斷爲患上哮喘病？ 有☐ 沒有☐
16. 他曾否用過醫生開的哮喘葯？ 有☐ 沒有☐
17. 在最近十二個月內，他有沒有哮喘病發作？ 有☐ 沒有☐

鼻問題

18. 他有沒有經常鼻塞或流鼻水？（經常即一星期有三天或以上；傷風感冒時鼻塞或流鼻水不算） 有☐ 沒有☐
19. 他曾否經醫生診斷爲患上鼻敏感症？ 有☐ 沒有☐
20. 他曾否經醫生診斷爲患上鼻竇炎？ 有☐ 沒有☐

其他疾病（經醫生証實）

21. 他曾否有皮膚敏感或濕疹？ 有☐ 沒有☐
22. 他曾否有痳疹（出痳仔）？ 有☐ 沒有☐
23. 他曾否有耳發炎？ 有☐ 沒有☐
24. 在最近十二個月內，他曾否有傷風或感冒？ 有☐ 沒有☐
25. 在最近十二個月內，他曾否有任何胸肺病，（例如：支氣管炎，肺炎，肺癆病）而要留在家中或在床上一個星期或以上？ 有☐ 沒有☐

第二部份 **孩子居住單位**

26. 孩子居住的單位是甚麼類型？（請選下列任何一項）
    ☐公共屋村
    ☐私人樓宇（一家人自住一單位）
    ☐私人樓宇（與別家人共住一單位）
    ☐居者有其屋
    ☐房屋署臨時房屋區，木屋或天台木屋
    ☐其他（包括石屋，鄉村屋）

27. 孩子與家人同住的居住單位實用面積有多少？ ____________平方英呎
28. 孩子在該單位居住了多久？ ________年 ________月
29. 請分別寫出有多少人與孩子同住在上述單位裏。

兄弟姊妹共 ：________人（不計算孩子自己）

父母/監護人共 ：________人

祖父母，外祖父母共：________人

其他親戚共 ：________人

其他朋友或同屋共 ：________人

30. 他居住的單位用甚麼燃料？ （可選多於一項）

☐煤氣
☐石油氣
☐火水爐
☐燒柴
☐電爐

第三部份 **父母職業及教育程度**

	母親 是	母親 否	母親 不知道	父親 是	父親 否	父親 不知道
31. 是否與孩子同住？	☐	☐	☐	☐	☐	☐
32. 現時是否有一份全職的職業？	☐	☐	☐	☐	☐	☐

33. 甚麼職業？（如果現時沒有職業，請填寫對上一份職業。退休人士請填退休前的職業）

母親	父親
☐家庭主婦	☐沒有一份全職工作
☐專業與行政，如醫生、律師、會計師	☐專業與行政，如醫生、律師、會計師
☐文職，如文員，郵務員，接線生	☐文職，如文員、郵務員、接線生
☐銷售業，如小販，店員、店舖東主	☐銷售業，如小販、店員、店舖東主
☐服務行業，如警察、導遊、理髮師	☐服務行業，如警察、導遊、理髮師
☐製造，運輸與勞工，如司機、包裝	☐製造、運輸與勞工，如司機、包裝
☐其它	☐其它

34. 教育程度是：

母親：（請選一項）	父親：（請選一項）
☐無正式入學	☐無正式入學
☐小學	☐小學
☐初中	☐初中
☐高中	☐高中
☐專上或大學	☐專上或大學

第四部份　　父母健康情況

喉嚨痛、咳與痰（傷風感冒時喉嚨痛、咳與痰不算）

	母親 是	母親 否	母親 不知道	父親 是	父親 否	父親 不知道
35. 有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服（經常即一星期有三天或以上）？	☐	☐	☐	☐	☐	☐
36. 有沒有經常在早上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）	☐	☐	☐	☐	☐	☐
37. 有沒有經常在晚上咳（經常即一星期有三天或以上）？（清喉嚨或咳一聲不算咳）	☐	☐	☐	☐	☐	☐
38. 有沒有經常在早上起床後便要咳痰？	☐	☐	☐	☐	☐	☐
39. 他有沒有經常在日間或晚上咳痰？	☐	☐	☐	☐	☐	☐
40. 在一年中他有沒有連續三個月或以上經常有痰？	☐	☐	☐	☐	☐	☐
41. 在過去十二個月內，有沒有因經常咳或痰而要看醫生？	☐	☐	☐	☐	☐	☐

其他疾病

有沒有以下的疾病？（經醫生証實）

	母親 有	母親 沒有	母親 不知道	父親 有	父親 沒有	父親 不知道
42. 肺炎	☐	☐	☐	☐	☐	☐
43. 肺結核或肺癆病	☐	☐	☐	☐	☐	☐
44. 皮膚敏感或濕疹	☐	☐	☐	☐	☐	☐
45. 慢性支氣管炎	☐	☐	☐	☐	☐	☐
46. 肺氣腫	☐	☐	☐	☐	☐	☐
47. 哮喘	☐	☐	☐	☐	☐	☐
48. 其他胸肺病	☐	☐	☐	☐	☐	☐
49. 心臟病或心臟問題	☐	☐	☐	☐	☐	☐
50. 血壓高	☐	☐	☐	☐	☐	☐
51. 鼻敏感症	☐	☐	☐	☐	☐	☐
52. 鼻竇炎	☐	☐	☐	☐	☐	☐
53. 請寫出相方配偶的年齡	______歲			______歲		

第五部份　　父母及他人吸煙問題

	母親 有	母親 沒有	母親 不知道	父親 有	父親 沒有	父親 不知道
54. 曾經吸過煙嗎？（曾於一年內每日吸一枝或以上，或一生人曾吸二十包或以上才算是）	☐	☐	☐	☐	☐	☐
如果你從來"沒有"吸煙，不用答第55至59題。						
如果你答"有"：						
55. 開始吸煙時你的年紀是多少？	______歲			______歲		
56. 現在（或最近一個月內）有沒有吸煙？	☐	☐	☐	☐	☐	☐
如果是現在"有"吸煙，請答第57題。						
如果現在"沒有"吸煙，請答第58, 59題。						
57. 你每日吸多少枝煙？	______枝			______枝		
58. 如果已經戒煙，成功戒煙的年紀是多少？	______歲			______歲		
59. 戒煙前，通常每日吸多少枝煙？	______枝			______枝		

	母親 是	母親 否	母親 不知道	父親 是	父親 否	父親 不知道
60. 除了香煙（煙仔）外，曾否吸過其他煙草（如雪茄、熟煙、煙斗）？	□	□	□	□	□	□
61. 有沒有聽過"香港不吸煙日"這個運動？	□	□	□	□	□	□
62. 如果是吸煙者，在"不吸煙日"有沒有停止吸煙？	□	□	□	□	□	□

63. 在與孩子同住的人中，有沒有吸煙者？ 有□ 沒有□
如果答"有"

64. 請填寫與孩子同住的吸煙人數：
兄弟姊妹共　　：________人
父母/監護人共　：________人
祖父母，外祖父母：________人
其他親戚共　　：________人
其他朋友或同屋共：________人

第六部份　　你對孩子吸煙的看法

65. 你對兒童吸煙的意見如何？
□非常反對　□反對　□無所謂　□贊成　□非常贊成

66. 你對你的孩子吸煙的意見如何？
□非常反對　□反對　□無所謂　□贊成　□非常贊成

67. 你認爲是否需要爲孩子提供反吸煙的健康教育？
□非常需要　□需要　□無所謂　□不需要　□非常不需要

68. 你認爲應該在甚麼地方爲孩子提供反吸煙的健康教育？（可填多項）
□家庭　□學校　□電視　□電台　□報章
□兒童刊物　□其他，請說明：________

第七部份　　空氣質素

69. 你認爲孩子居住單位室內的空氣好不好？ 好□ 不好□
70. 你認爲孩子居住單位室外附近的空氣好不好？ 好□ 不好□
71. 你認爲孩子學校的空氣好不好？ 好□ 不好□
72. 你認爲孩子居住的地區的空氣好不好？ 好□ 不好□
73. 你認爲孩子平日在外遊玩的地方（即家庭和學校以外）空氣好不好？ 好□ 不好□
74. 孩子居住單位內有沒有燒香燭？ 有□ 沒有□
75. 孩子居住單位內有沒有點蚊香（在春，夏時）？ 有□ 沒有□
76. 除了學校和家中，平日他在其他地方的時間（例如街上，公園）多或少？ 多□ 少□

77. 請填寫孩子的住址：________________________________
（如果你不方便填寫詳細地址，請寫上街道，或屋村名稱）

78. 電話號碼：________________________________

79. 我們希望將來能夠知道你們家庭的健康情況，你願不願意我們將來繼續與你們聯絡？ 願意□ 不願意□

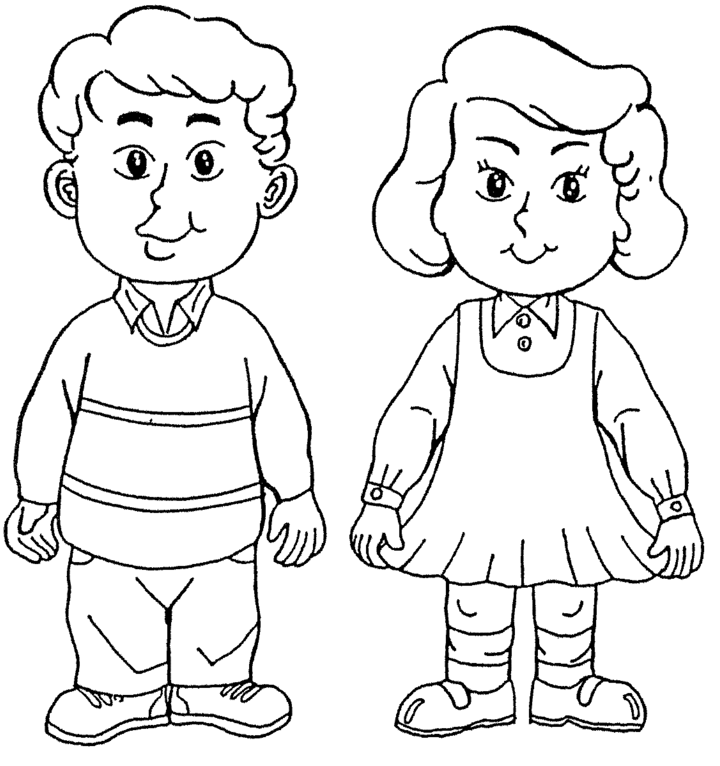
請你將塡好的問卷交由孩子帶回學校。十分多謝你幫忙。

姓名：________________

班級：________________

班號：________________

學童健康調查



各位小朋友，你好嗎？我們想請你幫忙，回答一些健康問題．
請你答問題時，不要問你的隔鄰同學，也不要看別人的答案．

 □□□□-□□□-□□
(請勿填寫此格)

親愛的同學，這份問卷不是測驗，是不計分數的．你的老師和家長都不會看到你的答案．請你告訴我們你自己的情形．除了醫生和護士之外，沒有人會知道是誰答這份問卷的．

首先，讓我們認識你好嗎？

1. 你是男孩還是女孩？　男孩□　女孩□
2. 你出生的日期是：　_____年_____月_____日

第一部份　　你的健康情況

我們想知道有關喉嚨痛、咳、痰、呼吸困難和流鼻水的情形．
(傷風感冒時的喉嚨痛、咳、痰、呼吸困難和流鼻水不算)．

喉嚨痛和咳

3. 你有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服？　有□　沒有□
4. 你有沒有經常在早上咳？　有□　沒有□
5. 你有沒有經常在晚上咳？　有□　沒有□
6. 在一年中你有沒有連續三個月或以上經常在日間或晚上咳？　有□　沒有□
7. 在最近的三個月內，你有沒有因為經常咳而要看醫生？　有□　沒有□

痰

8. 你有沒有經常在早上起床後便要咳痰？　有□　沒有□
9. 你有沒有經常在日間或晚上咳痰？　有□　沒有□
10. 在一年中你有沒有連續三個月或以上經常有痰？　有□　沒有□
11. 在最近的三個月內，你有沒有因經常有痰而要看醫生？　有□　沒有□

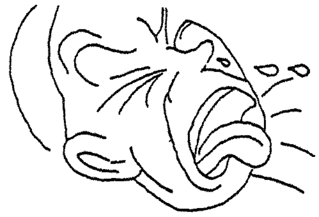
呼吸困難或氣促

12. 你有沒有試過呼吸時，胸部或肺部發出響聲，『鳴鳴聲』或『哮喘聲』？　有□　沒有□
如果沒有聲，不用答第13至16題．

(13) 如果有聲，這通常是在日間還是晚上發生？　日間□　晚上□
(14) 如果有聲，最近一次是在幾時之前發生？　_____月_____日前
(15) 在最近的三個月內，你有沒有試過因為呼吸發出響聲，而引起呼吸困難或氣促？　有□　沒有□
(16) 在最近三個月內，你有沒有因為呼吸發出響聲而要看醫生？　有□　沒有□

17. 你曾否經醫生診斷為患上哮喘病？　有□　沒有□

鼻塞和流鼻水：



18. 你有沒有經常鼻塞或流鼻水？ 有□ 沒有□

19. 在最近的三個月內，你有沒有因為經常鼻塞或流鼻水而看醫生？ 有□ 沒有□

20. 你曾否經醫生診斷為患上鼻敏感症？ 有□ 沒有□

21. 你曾否經醫生診斷為患上鼻竇炎？ 有□ 沒有□

第二部份　　吸煙問題

我們想知道你家中有沒有人吸煙.

22. 你的爸爸吸煙嗎？
- 1 □吸
- 2 □以前吸,現在不吸
- 3 □從來不吸
- 9 □不知道
- 3 □我沒有爸爸/爸爸不與我同住

23. 你的媽媽吸煙嗎？
- 1 □吸
- 2 □以前吸,現在不吸
- 3 □從來不吸
- 9 □不知道
- 3 □我沒有媽媽/媽媽不與我同住

24. 和你同住的兄弟姊妹中，有沒有人吸煙？
- 1 □有
- 0 □沒有
- 0 □我沒有兄弟姊妹

如果沒有，不用答第25題.

(25) 如果有，吸煙的人是：
- □ 姐姐
- □ 妹妹
- □ 哥哥
- □ 弟弟

26. 除了爸媽和兄弟姊妹外，和你同住的其他人吸煙嗎？
- 1 □有
- 0 □沒有
- 0 □我沒有和他人同住

如果沒有，不用答第27題.

(27) 如果有，和你同住的吸煙的人是：
- □祖父母或外祖父母
- □親戚
- □家人的朋友
- □其他人

我們想問你對吸煙的意見.

28.	如果你吸煙，你的爸爸會管你嗎？	會☐	不會☐	不知道☐
29.	如果你吸煙，你的媽媽會管你嗎？	會☐	不會☐	不知道☐
30.	如果你吸煙，你的老師會管你嗎？	會☐	不會☐	不知道☐
31.	你有沒有見過你的老師吸煙？	有☐	沒有☐	
32.	你認為老師吸煙是可以的嗎？	可以☐	不可以☐	不知道☐
33.	你有沒有見過你同班的同學吸煙？	有☐	沒有☐	
34.	你認為同學吸煙是可以的嗎？	可以☐	不可以☐	不知道☐

請告訴我們下面的問題中，哪些你認為是對的，哪些不對.

35.	吸煙會令你比較容易氣促或呼吸困難	對☐	不對☐	不知道☐
36.	吸煙會令你比較容易咳	對☐	不對☐	不知道☐
37.	吸煙會使你多頭皮	對☐	不對☐	不知道☐
38.	吸煙會危害你的肺	對☐	不對☐	不知道☐
39.	吸煙會危害你的心臟	對☐	不對☐	不知道☐
40.	吸煙會使你患上癌症	對☐	不對☐	不知道☐
41.	吸煙很好玩	對☐	不對☐	不知道☐
42.	兒童吸煙是為了表示自己"威水"	對☐	不對☐	不知道☐
43.	吸煙使你神經放鬆	對☐	不對☐	不知道☐
44.	吸煙使你顯得堅強	對☐	不對☐	不知道☐
45.	吸煙浪費金錢	對☐	不對☐	不知道☐
46.	吸煙使你感到自己成熟	對☐	不對☐	不知道☐
47.	吸煙可以減肥	對☐	不對☐	不知道☐
48.	吸煙給你信心	對☐	不對☐	不知道☐

下面是一些關於你和吸煙的問題. 請老實回答. 信任我們，我們不會讓任何人知道你的答案.

49. 先看下面的句子，在最適合你的句子前填上 ☑ (只填一項)

- ☐ 我從來沒吸過煙
- ☐ 我只吸過一次或幾次煙 (玩的，試吸的都算)
- ☐ 我以前有吸煙習慣，但現在不吸
- ☐ 我有時會吸煙，但一星期吸不夠一枝煙
- ☐ 我一星期吸一至六枝煙
- ☐ 我一星期吸多過六枝煙

如果你從來沒有吸過煙，不用答第50、51題.
如果你曾經吸過煙 (即使是吸過一次或幾次)：

(50) 請寫上最初吸煙時你多少歲？ ____________歲

(51) 自從昨天早餐後，你吸過多少枝煙？ ____________枝

1990

姓名：________________

班級：________________

班號：________________

學童健康調查

各位小朋友，你好嗎？我們想請你幫忙，回答一些健康問題.
請你答問題時，不要問你的隔鄰同學，也不要看別人的答案.

(請勿填寫此格)

親愛的同學，這份問卷不是測驗，是不計分數的．你的老師和家長都不會看到你的答案．請你告訴我們你自己的情形．除了醫生和護士之外，沒有人會知道是誰答這份問卷的．

首先，讓我們認識你好嗎？

1. 你是男孩還是女孩？ 男孩□ 女孩□
2. 你出生的日期是： ______年______月______日

第一部份 你的健康情況

感冒

3. 你在最近十天內有沒有患感冒？ 有□ 沒有□

喉嚨痛和咳

我們想知道有關喉嚨痛、咳、痰、呼吸困難和流鼻水的情形．
(傷風感冒時的喉嚨痛、咳、痰、呼吸困難和流鼻水不算)．

4. 你有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服？ 有□ 沒有□
5. 你有沒有經常在早上咳？ 有□ 沒有□
6. 你有沒有經常在晚上咳？ 有□ 沒有□
7. 在一年中你有沒有連續三個月或以上經常在日間或晚上咳？ 有□ 沒有□

痰

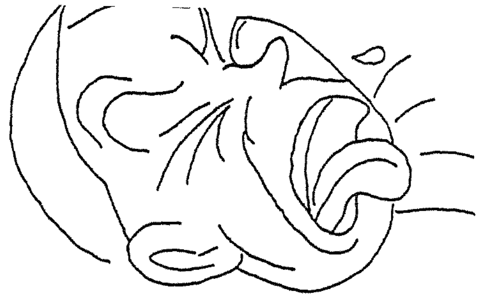
8. 你有沒有經常在早上起床後便要咳痰？ 有□ 沒有□
9. 你有沒有經常在日間或晚上咳痰？ 有□ 沒有□
10. 在一年中你有沒有連續三個月或以上經常有痰？ 有□ 沒有□

呼吸困難或氣促

11. 你有沒有試過呼吸時，胸部或肺部發出響聲，『嗚嗚聲』或『哮喘聲』？ 有□ 沒有□
    如果沒有聲，不用答第12至15題．

    12. 如果有聲，這通常是在日間還是晚上發生？ 日間□ 晚上□
    13. 如果有聲，最近一次是在幾時之前發生？ ____月前，或____日前
    14. 在最近的三個月內，你有沒有試過因為呼吸發出響聲，而引起呼吸困難或氣促？ 有□ 沒有□
    15. 在最近三個月內，你有沒有因為呼吸發出響聲，而要看醫生？ 有□ 沒有□

16. 你曾否經醫生診斷為患上哮喘病？ 有□ 沒有□
17. 你在最近兩天內有沒有使用哮喘藥物？ 有□ 沒有□



鼻塞和流鼻水

18. 你有沒有經常鼻塞或流鼻水？ 有☐ 沒有☐
19. 你曾否經醫生診斷為患上鼻敏感症？ 有☐ 沒有☐
20. 你曾否經醫生診斷為患上鼻竇炎？ 有☐ 沒有☐

第二部份 **吸煙問題**

我們想知道你家中有沒有人吸煙.

21. 你的爸爸吸煙嗎？
☐吸
☐以前吸,現在不吸
☐從來不吸
☐不知道
☐我沒有爸爸/爸爸不與我同住

22. 你的媽媽吸煙嗎？
☐吸
☐以前吸,現在不吸
☐從來不吸
☐不知道
☐我沒有媽媽/媽媽不與我同住

23. 和你同住的兄弟姊妹中，有沒有人吸煙？
☐有
☐沒有
☐我沒有兄弟姊妹

如果沒有，不用答第24題.

(24) 如果有，吸煙的人是：
☐ 姐姐
☐ 妹妹
☐ 哥哥
☐ 弟弟

25. 除了爸媽和兄弟姊妹外，和你同住的其他人吸煙嗎？
☐有
☐沒有
☐我沒有和他人同住

如果沒有，不用答第26題.

(26) 如果有，和你同住的吸煙的人是：
☐祖父母或外祖父母
☐親戚
☐家人的朋友
☐其他人

我們想問你對吸煙的意見.

27. 如果你吸煙，你的爸爸會管你嗎?	會☐	不會☐	不知道☐
28. 如果你吸煙，你的媽媽會管你嗎?	會☐	不會☐	不知道☐
29. 如果你吸煙，你的老師會管你嗎?	會☐	不會☐	不知道☐
30. 你有沒有見過你的老師吸煙?	有☐	沒有☐	
31. 你認為老師吸煙是可以的嗎?	可以☐	不可以☐	不知道☐
32. 你有沒有見過你同班的同學吸煙?	有☐	沒有☐	
33. 你認為同學吸煙是可以的嗎?	可以☐	不可以☐	不知道☐

請告訴我們下面的問題中，哪些你認為是對的，哪些不對.

34. 吸煙會令你比較容易氣促或呼吸困難	對☐	不對☐	不知道☐
35. 吸煙會令你比較容易咳	對☐	不對☐	不知道☐
36. 吸煙會使你多頭皮	對☐	不對☐	不知道☐
37. 吸煙會危害你的肺	對☐	不對☐	不知道☐
38. 吸煙會危害你的心臟	對☐	不對☐	不知道☐
39. 吸煙會使你患上癌症	對☐	不對☐	不知道☐
40. 吸煙很好玩	對☐	不對☐	不知道☐
41. 兒童吸煙是為了表示自己"威水"	對☐	不對☐	不知道☐
42. 吸煙使你神經放鬆	對☐	不對☐	不知道☐
43. 吸煙使你顯得堅強	對☐	不對☐	不知道☐
44. 吸煙浪費金錢	對☐	不對☐	不知道☐
45. 吸煙使你感到自己成熟	對☐	不對☐	不知道☐
46. 吸煙可以減肥	對☐	不對☐	不知道☐
47. 吸煙給你信心	對☐	不對☐	不知道☐

下面是一些關於你和吸煙的問題. 請老實回答. 信任我們，我們不會讓任何人知道你的答案.

48. 先看下面的句子，在最適合你的句子前填上 ☐ (只填一項)

☐ 我從來沒吸煙
☐ 我只吸過一次或幾次煙 (玩的，試吸的都算)
☐ 我以前有吸煙習慣，但現在不吸
☐ 我有時會吸煙，但一星期吸不夠一枝煙
☐ 我一星期吸一至六枝煙
☐ 我一星期吸多過六枝煙

如果你從來沒有吸煙，不用答第 49、50 題.
如果你曾經吸過煙 (即使是吸過一次或幾次):
(49) 請寫上最初吸煙時你多少歲? ____________ 歲
(50) 自從昨天早餐後，你吸過多少枝煙? ____________ 枝

第三部份 环境與空氣質素

環境與空氣質素

我們想知道你對周圍的空氣質素的看法.

51. 你家中的空氣好不好? 好☐ 不好☐
52. 你學校裏面的空氣好不好? 好☐ 不好☐

53. 除了返學校和在家裏, 平日你多不多去其他地方? 多☐ 不多☐

54. 最後, 請寫上你的住址:

____

55. 你的電話號碼: ____________________

學童健康調查

1991

請勿填寫此欄．

ID :

BH : cm

BW : kg

DOE:

姓名：______________________

班級：______________________

班號：______________________

各位小朋友，你好嗎？我們想請你幫忙，回答一些健康問題。請你答問題時，不要問你的隔鄰同學，也不要看別人的答案。

親愛的同學，這份問卷不是測驗，是不計分數的。你的老師和家長都不會看到你的答案。請你告訴我們你自己的情形，除了醫生和護士之外，沒有人會知道是誰答這份問卷的。

首先，讓我們認識你好嗎？

1. 你是男孩還是女孩？ 男孩☐ 女孩☐
2. 你出生的日期是： _____年_____月_____日
3. 你的出生地點是： 香港 ☐
   中國大陸 ☐
   其他地方 ☐

第一部份 **你的健康情況**

傷風感冒

4. 你在最近十天內有沒有患傷風感冒？ 有☐ 沒有☐

喉嚨痛和咳

我們想知道有關喉嚨痛、咳、痰、呼吸困難和流鼻水的情形。
（傷風感冒時的喉嚨痛、咳、痰、呼吸困難和流鼻水不算）。

5. 你有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服？ 有☐ 沒有☐
6. 你有沒有經常在早上咳？ 有☐ 沒有☐
7. 你有沒有經常在晚上咳？ 有☐ 沒有☐
8. 在一年中你有沒有連續三個月或以上經常在日間或晚上咳？ 有☐ 沒有☐
9. 在最近的三個月內，你有沒有因爲經常咳而要看醫生？ 有☐ 沒有☐

痰

10. 你有沒有經常在早上起床後便要咳痰？ 有☐ 沒有☐
11. 你有沒有經常在日間或晚上咳痰？ 有☐ 沒有☐
12. 在一年中你有沒有連續三個月或以上經常有痰？ 有☐ 沒有☐
13. 在最近的三個月內，你有沒有因爲經常有痰而要看醫生？ 有☐ 沒有☐

呼吸困難或氣促

14. 你有沒有試過呼吸時，胸部或肺部發出響聲，
    『嗚嗚聲』或『哮喘聲』？ 有☐ 沒有☐
    如果沒有聲，不用答第15至18題。

(15) 如果有聲，這通常是在日間還是晚上發生？ 日間☐ 晚上☐

(16) 如果有聲，最近一次是在幾時之前發生？ ____月前，或____日前

(17) 在最近的三個月內，你有沒有試過因爲呼吸發出響聲，而引起呼吸困難或氣促？ 有☐ 沒有☐

(18) 在最近三個月內，你有沒有因爲呼吸發出響聲，而要看醫生？ 有☐ 沒有☐

19. 你曾否經醫生診斷爲患上哮喘病？ 有☐ 沒有☐

20. 你在最近兩天內有沒有使用哮喘藥物？ 有☐ 沒有☐

鼻塞、流鼻水、皮膚敏感：

21. 你有沒有經常鼻塞或流鼻水？ 有☐ 沒有☐

22. 你曾否經醫生診斷爲患上鼻敏感症？ 有☐ 沒有☐

23. 你曾否經醫生診斷爲患上鼻竇炎？ 有☐ 沒有☐

24. 你曾否經醫生診斷爲患上皮膚敏感或濕疹？ 有☐ 沒有☐

第二部份 **吸煙問題**

我們想知道你家中有沒有人吸煙。

25. 你的爸爸吸煙嗎？

☐吸
☐以前吸，現在不吸
☐從來不吸
☐不知道
☐我沒有爸爸/爸爸不與我同住

26. 你的媽媽吸煙嗎？

☐吸
☐以前吸，現在不吸
☐從來不吸
☐不知道
☐我沒有媽媽/媽媽不與我同住

27. 和你同住的兄弟姊妹中，有沒有人吸煙？

☐有
☐沒有
☐我沒有兄弟姊妹同住

如果沒有，不用答第28題。

(28) 如果有，和你同住的吸煙的人是：

☐姐姐
☐妹妹
☐哥哥
☐弟弟

29. 除了爸媽和兄弟姊妹外，和你同住的其他人吸煙嗎？

☐有
☐沒有
☐我沒有和他人同住

如果沒有，不用答第30題。

(30) 如果有，和你同住的吸煙的人是：

☐祖父母或外祖父母
☐親戚
☐家人的朋友
☐其他人

我們想問你對吸煙的意見。

31. 如果你吸煙，你的爸爸會管你嗎？	會☐	不會☐	不知道☐
32. 如果你吸煙，你的媽媽會管你嗎？	會☐	不會☐	不知道☐
33. 如果你吸煙，你的老師會管你嗎？	會☐	不會☐	不知道☐
34. 你有沒有見過你的老師吸煙？	有☐	沒有☐	
35. 你認爲老師吸煙是可以的嗎？	可以☐	不可以☐	不知道☐
36. 你有沒有見過你同班的同學吸煙？	有☐	沒有☐	
37. 你認爲同學吸煙是可以的嗎？	可以☐	不可以☐	不知道☐

請告訴我們下面的問題中，哪些你認爲是對的，哪些不對。

38. 吸煙會令你比較容易氣促或呼吸困難	對☐	不對☐	不知道☐
39. 吸煙會令你比較容易咳	對☐	不對☐	不知道☐
40. 吸煙會使你多頭皮	對☐	不對☐	不知道☐
41. 吸煙會危害你的肺	對☐	不對☐	不知道☐
42. 吸煙會危害你的心臟	對☐	不對☐	不知道☐
43. 吸煙會使你患上癌症	對☐	不對☐	不知道☐
44. 吸煙很好玩	對☐	不對☐	不知道☐
45. 兒童吸煙是爲了表示自己“威水”	對☐	不對☐	不知道☐
46. 吸煙使你神經放鬆	對☐	不對☐	不知道☐
47. 吸煙使你顯得堅强	對☐	不對☐	不知道☐
48. 吸煙浪費金錢	對☐	不對☐	不知道☐
49. 吸煙使你感到自己成熟	對☐	不對☐	不知道☐
50. 吸煙可以減肥	對☐	不對☐	不知道☐
51. 吸煙給你信心	對☐	不對☐	不知道☐
52. 吸煙會令你比較容易傷風、感冒或喉嚨痛	對☐	不對☐	不知道☐
53. 吸煙會使你上癮	對☐	不對☐	不知道☐
54. 吸煙會使你在運動時表現較差	對☐	不對☐	不知道☐
55. 吸煙的學生的學業成績比較差	對☐	不對☐	不知道☐

請指出以下的商標或牌子名稱是代表甚麼物品（在適當的物品下填上☑）

	食品	香煙	飲品	其他	不知道
56. 嘉士伯	☐	☐	☐	☐	☐
57. 萬寶路	☐	☐	☐	☐	☐
58. 吉百利	☐	☐	☐	☐	☐
59. 高露潔	☐	☐	☐	☐	☐
60. 沙龍	☐	☐	☐	☐	☐
61. 馬爹利	☐	☐	☐	☐	☐
62.	☐	☐	☐	☐	☐
63.	☐	☐	☐	☐	☐
64. Carlsberg	☐	☐	☐	☐	☐
65. Garden	☐	☐	☐	☐	☐
66. Salem	☐	☐	☐	☐	☐
67. Colgate	☐	☐	☐	☐	☐
68. Coke	☐	☐	☐	☐	☐

69. 你對自己的學業成績有信心嗎？ 很有信心☐ 有信心☐ 普通☐ 沒信心☐ 很沒信心☐
70. 你對自己的運動表現有信心嗎？ 很有信心☐ 有信心☐ 普通☐ 沒信心☐ 很沒信心☐
71. 你對自己與朋友相處有信心嗎？ 很有信心☐ 有信心☐ 普通☐ 沒信心☐ 很沒信心☐
72. 總的來說，你對自己做人有信心嗎？ 很有信心☐ 有信心☐ 普通☐ 沒信心☐ 很沒信心☐

下面是一些關於你和吸煙的問題。請老實回答。信任我們，我們不會讓任何人知道你的答案。

73. 先看下面的句子，在最適合你的句子前填上☑（只填一項）
- ☐我從來沒吸過煙
- ☐我只吸過一次或幾次煙（玩的，試吸的都算）
- ☐我以前有吸煙習慣，但現在不吸
- ☐我有時會吸煙，但一星期吸不夠一枝煙
- ☐我一星期吸一至六枝煙
- ☐我一星期吸多過六枝煙

74. 你曾否買過香煙（可填多項）
- ☐從未買過
- ☐在超級市場買過（包括7-11）
- ☐在商店買過
- ☐在攤檔買過
- ☐在其它地方買過

如果你從來沒有吸過煙，不用答第75、76、77題。
如果你曾經吸過煙（即使是吸過一次或幾次）：

(75) 你吸的香煙是從那裏得到的？（可填多項）

☐自己買的	☐父親	☐母親	☐兄，姐　姐
☐弟妹	☐外祖父母或祖父母	☐其他親戚	
☐同學	☐朋友（不是同學）	☐其他人	

(76) 請寫上最初吸煙時你多少歲？ ________歲
(77) 自從昨天早餐後，你吸過多少枝煙？ ________枝

第三部份　　　　**環境與空氣質素**

我們想知道你對周圍的空氣質素的看法。

78. 你家中的空氣好不好？　　好☐　不好☐
79. 你學校裏面的空氣好不好？　　好☐　不好☐
80. 除了返學校和在家裏，平日你多不多去其他地方？　　多☐　不多☐
81. 最後，請寫上你的住址：

____

82. 你的電話號碼：________________

1992

學童健康調查

請勿填寫此欄：

ID89		ID :	
ID90		BH :	cm
ID91		BW :	kg
		DOE:	

姓名：______________________

班級：______________________

班號：______________________

各位小朋友，你好嗎？我們想請你幫忙，回答一些健康問題。請你答問題時，不要問你的隔鄰同學，也不要看別人的答案。

親愛的同學，這份問卷不是測驗，是不計分數的。你的老師和家長都不會看到你的答案。請你告訴我們你自己的情形，除了醫生和護士之外，沒有人會知道是誰答這份問卷的。

首先，讓我們認識你好嗎？

1. 你是男孩還是女孩？ 男孩☐ 女孩☐
2. 你出生的日期是： ______年______月______日
3. 你的出生地點是： 香港 ☐
   中國大陸 ☐
   其他地方 ☐

第一部份 **你的健康情況**

傷風感冒

4. 你在最近十天內有沒有患傷風感冒？ 有☐ 沒有☐

喉嚨痛和咳

我們想知道有關喉嚨痛、咳、痰、呼吸困難和流鼻水的情形。
（傷風感冒時的喉嚨痛、咳、痰、呼吸困難和流鼻水不算）。

5. 你有沒有經常喉嚨痛、喉嚨痕或喉嚨不舒服？ 有☐ 沒有☐
6. 你有沒有經常在早上咳？ 有☐ 沒有☐
7. 你有沒有經常在晚上咳？ 有☐ 沒有☐
8. 在一年中你有沒有連續三個月或以上經常在日間或晚上咳？ 有☐ 沒有☐
9. 在最近的三個月內，你有沒有因爲經常咳而要看醫生？ 有☐ 沒有☐

痰

10. 你有沒有經常在早上起床後便要咳痰？ 有☐ 沒有☐
11. 你有沒有經常在日間或晚上咳痰？ 有☐ 沒有☐
12. 在一年中你有沒有連續三個月或以上經常有痰？ 有☐ 沒有☐
13. 在最近的三個月內，你有沒有因爲經常有痰而要看醫生？ 有☐ 沒有☐

呼吸困難或氣促

14. 你有沒有試過呼吸時，胸部或肺部發出響聲，
    『嗚嗚聲』或『哮喘聲』？ 有☐ 沒有☐
    如果沒有聲，不用答第15至18題。

(15) 如果有聲，這通常是在日間還是晚上發生？ 日間☐ 晚上☐

(16) 如果有聲，最近一次是在幾時之前發生？
（只可選下列任何一項）

在七日內 ☐
二至四星期前 ☐
二至三個月前 ☐
四至五個月前 ☐
六個月前或以上☐

(17) 在最近的三個月內，你有沒有試過因爲呼吸發出響聲，而引起呼吸困難或氣促？ 有☐ 沒有☐

(18) 在最近三個月內，你有沒有因爲呼吸發出響聲，而要看醫生？ 有☐ 沒有☐

19. 你曾否經醫生診斷爲患上哮喘病？ 有☐ 沒有☐
20. 你在最近兩天內有沒有使用哮喘藥物？ 有☐ 沒有☐

鼻塞、流鼻水、皮膚敏感：

21. 你有沒有經常鼻塞或流鼻水？ 有☐ 沒有☐
22. 你曾否經醫生診斷爲患上鼻敏感症？ 有☐ 沒有☐
23. 你曾否經醫生診斷爲患上鼻竇炎？ 有☐ 沒有☐
24. 你曾否經醫生診斷爲患上皮膚敏感或濕疹？ 有☐ 沒有☐

第二部份 吸煙問題

我們想知道你家中有沒有人吸煙。

25. 你的爸爸吸煙嗎？

☐吸
☐以前吸，現在不吸
☐從來不吸
☐不知道
☐我沒有爸爸/
爸爸不與我同住

26. 你的媽媽吸煙嗎？

☐吸
☐以前吸，現在不吸
☐從來不吸
☐不知道
☐我沒有媽媽/
媽媽不與我同住

27. 和你同住的兄弟姊妹中，有沒有人吸煙？

☐有
☐沒有
☐我沒有兄弟姊妹同住

如果答<u>有</u>，請答第28題。
如果<u>沒有</u>，不用答第28題。

(28) 與你同住而吸煙的人是：

☐姐姐
☐妹妹
☐哥哥
☐弟弟

29. 除了爸媽和兄弟姊妹外，和你同住的其他人吸煙嗎？

☐有
☐沒有
☐我沒有和他人同住

如果答有，請答第30題。
如果沒有，不用答第30題。

(30) 與你同住而吸煙的人是：

☐祖父母或外祖父母
☐親戚
☐家人的朋友
☐其他人

我們想問你對吸煙的意見。

31. 如果你吸煙，你的爸爸會管你嗎？ 會☐ 不會☐ 不知道☐
32. 如果你吸煙，你的媽媽會管你嗎？ 會☐ 不會☐ 不知道☐
33. 如果你吸煙，你的老師會管你嗎？ 會☐ 不會☐ 不知道☐
34. 你有沒有見過你的老師吸煙？ 有☐ 沒有☐
35. 你認爲老師吸煙是可以的嗎？ 可以☐ 不可以☐ 不知道☐
36. 你有沒有見過你同班的同學吸煙？ 有☐ 沒有☐
37. 你認爲同學吸煙是可以的嗎？ 可以☐ 不可以☐ 不知道☐

請告訴我們下面的問題中，哪些你認爲是對的，哪些不對。

38. 吸煙會令你比較容易氣促或呼吸困難 對☐ 不對☐ 不知道☐
39. 吸煙會令你比較容易咳 對☐ 不對☐ 不知道☐
40. 吸煙會使你多頭皮 對☐ 不對☐ 不知道☐
41. 吸煙會危害你的肺 對☐ 不對☐ 不知道☐
42. 吸煙會危害你的心臟 對☐ 不對☐ 不知道☐
43. 吸煙會使你患上癌症 對☐ 不對☐ 不知道☐
44. 吸煙很好玩 對☐ 不對☐ 不知道☐
45. 兒童吸煙是爲了表示自己"威水" 對☐ 不對☐ 不知道☐
46. 吸煙使你神經放鬆 對☐ 不對☐ 不知道☐
47. 吸煙使你顯得堅强 對☐ 不對☐ 不知道☐
48. 吸煙浪費金錢 對☐ 不對☐ 不知道☐
49. 吸煙使你感到自己成熟 對☐ 不對☐ 不知道☐
50. 吸煙可以減肥 對☐ 不對☐ 不知道☐
51. 吸煙給你信心 對☐ 不對☐ 不知道☐
52. 吸煙會令你比較容易傷風、感冒或喉嚨痛 對☐ 不對☐ 不知道☐
53. 吸煙會使你上癮 對☐ 不對☐ 不知道☐
54. 吸煙會使你在運動時表現較差 對☐ 不對☐ 不知道☐
55. 吸煙的學生的學業成績比較差 對☐ 不對☐ 不知道☐

請指出以下的商標或牌子名稱是代表甚麼物品（在適當的物品下填上☑）

	食品	香煙	飲品	其他	不知道
56. 嘉士伯	☐	☐	☐	☐	☐
57. 萬寶路	☐	☐	☐	☐	☐
58. 吉百利	☐	☐	☐	☐	☐
59. 高露潔	☐	☐	☐	☐	☐
60. 沙龍	☐	☐	☐	☐	☐
61. 馬爹利	☐	☐	☐	☐	☐
62.	☐	☐	☐	☐	☐
63.	☐	☐	☐	☐	☐
64. Carlsberg	☐	☐	☐	☐	☐
65. Garden	☐	☐	☐	☐	☐
66. Salem	☐	☐	☐	☐	☐
67. Colgate	☐	☐	☐	☐	☐
68. Coke	☐	☐	☐	☐	☐

69. 你有沒有見過在香煙廣告上的警告標語？ 有☐ 沒有☐

70. 你對自己的學業成績有信心嗎？ 很有信心☐ 有信心☐ 普通☐ 沒信心☐ 很沒信心☐
71. 你對自己的運動表現有信心嗎？ 很有信心☐ 有信心☐ 普通☐ 沒信心☐ 很沒信心☐
72. 你對自己與朋友相處有信心嗎？ 很有信心☐ 有信心☐ 普通☐ 沒信心☐ 很沒信心☐
73. 總的來說，你對自己做人有信心嗎？ 很有信心☐ 有信心☐ 普通☐ 沒信心☐ 很沒信心☐

下面是一些關於你和吸煙的問題。請老實回答。信任我們，我們不會讓任何人知道你的答案。

74. 你曾否買過香煙（可填多項）
- ☐從未買過
- ☐在超級市場買過（包括7-11）
- ☐在商店買過
- ☐在攤檔買過
- ☐在其它地方買過

75. 先看下面的句子，在最適合你的句子前填上☑（只填一項）
- ☐我從來沒吸過煙
- ☐我只吸過一次或幾次煙（玩的，試吸的都算）
- ☐我以前有吸煙習慣，但現在不吸
- ☐我有時會吸煙，但一星期吸不夠一枝煙
- ☐我一星期吸一至六枝煙
- ☐我一星期吸多過六枝煙

如果你從來沒有吸過煙，請答第76題。
如果你曾經吸過煙（即使是吸過一次或幾次），請答第77-79題。

(76) 你將來會不會吸煙？
一定會☐ 會☐ 不會☐ 一定不會☐ 不知道☐

(77) 你吸的香煙是從那裏得到的？（可填多項）

☐自己買的	☐父親	☐母親	☐兄，姐
☐弟妹	☐外祖父母或祖父母	☐其他親戚	
☐同學	☐朋友（不是同學）	☐其他人	

(78) 請寫上最初吸煙時你多少歲？ ________歲
(79) 自從昨天早餐後，你吸過多少枝煙？ ________枝

第三部份 **環境與空氣質素**

我們想知道你對周圍的空氣質素的看法。

80. 你家中的空氣好不好？ 好☐ 不好☐
81. 你學校裏面的空氣好不好？ 好☐ 不好☐
82. 除了返學校和在家裏，平日你多不多去其他地方？ 多☐ 不多☐
83. 最後，請寫上你的住址：

____

84. 你的電話號碼：__________________

學校: ______________
班級: ______________

班主任老師:

非常多謝你的協助，使我們能夠順利進行這次調查的工作。爲了方便全面分析和了解我們所得到的資料，請你們回答以下幾條問題。你的合作，對我們的研究十分重要。你提供的資料，會絕對保密。謝謝。

如果你有任何問題，請致電: 8199199與我們聯絡。

香港大學社會醫學系
賀達理教授

老師問卷

	非常好	好	差	非常差	不知道
1. 你認爲你負責的一班的課室內的空氣質素怎樣?	☐	☐	☐	☐	☐
2. 你認爲你學校內整體的空氣質素怎樣?	☐	☐	☐	☐	☐
3. 你認爲你學校周圍的空氣質素怎樣?	☐	☐	☐	☐	☐

4. 你負責的一班的學生有沒有人吸煙? 有☐ 沒有☐
5. 如果有，有多少人? ____________
6. 你有見過你班的學生吸煙嗎? 有☐ 沒有☐
7. 如果有，有多少人? ____________
8. 除了你班外，你有見過其他學生吸煙嗎? 有☐ 沒有☐
9. 如果有，有多少人? ____________
10. 你對兒童吸煙的意見如何?
☐ 非常反對 ☐ 反對 ☐ 無所謂 ☐ 贊成 ☐ 非常贊成
11. 你認爲是否需要爲兒童提供反吸煙的健康教育?
☐ 非常需要 ☐ 需要 ☐ 無所謂 ☐ 不需要 ☐ 非常不需要
12. 今天你班的學生有沒有缺席? 有☐ 沒有☐
13. 如果有，請填寫缺席者姓名及是否因病缺席:
____
14. 在 年 月 日至 月 日的四個星期內，你班的學生因病缺席的情況怎樣?（請查閱課室日誌）
因病缺席有: ________人（只計算人數，不計算缺席天數）
因病缺席有: ________人次（以人次計算，一人缺席三天等於三人次）

學童驗身表格

學　　校: ____________________
班　　級: ____________________
班　　號: ____________________
學童姓名: ____________________
出生日期: ____年____月____日
性別: ☐男 ☐女

驗身結果：

身高：______________ 公寸（cm）
體重：______________ 千克（kg）
呼氣中一氧化炭的含量：百萬份之__________(ppm)
肺功能：

(1) 是否成功完成：
(a) Vitalograph 是☐ 不是☐ 沒有測驗☐
(b) Mini Wright 是☐ 不是☐ 沒有測驗☐

(2) 測驗結果： 正常☐ 不正常☐

醫生備註：____
____
____

醫生簽署：

日　期：______(年) ______(月) ______(日)

Children and Class Teacher Questionnaire Administrations
Filed Work Monitor Form

School:______________________________ Class:____________

No. of students:___________________

No. of consenting students:_____ No. of not consenting:______

Date of visit:____________________ Time: Start______ End_____

Name of absentees and whether the absence is due to illlness:___
____

==

No. of questionnaires distributed:_______ No. collected:_____

Teacher's questionnaires distributed: Yes No

completed and collected: Yes No

Is class teacher present during questionnaire administration? Yes No

Is other teacher present? Yes No

Is the class cooperative?

Very cooperative

Cooperative

Not cooperative

Very uncooperative

Are there students who do not follow instructions?

Yes. No. of students:________

No

Is there are problem or troublesome students, note down their names or class no:____

Other remarks:
____
____

Signature of person administering questionnaire:______________________

APPENDIX 2

南區學童健康調查致家長信

各位家長：

由南區區議會支持的一項小學三至六年級學童健康調查計劃將於本年四月開始舉行。

調查的目的：

調查所得的資料，將有助區議會向政府作出有關保障及促進兒童健康的建議，同時家長亦可了解子女的健康狀況，調查工作將由香港大學社會醫學系教授賀達理醫生領導該系及兒科學系的一組醫生，護士及科研人員執行，本區數間學校獲邀參予這項計劃。

學校支持這項調查：

基於這項調查能爲本區區內兒童健康情況提供寶貴資料，校方樂意支持這項計劃，學童只需在學校接受簡單的檢驗，包括量度身高和體重。

我們需要家長的協助：

我們亦希望家長能提供有關子女健康狀況的資料，請協助我們塡妥附上的允許子女參予這項調查的家長同意書和一份家庭健康問卷，並請將問卷及同意書裝入附上的信封內，封口後交子女帶回學校，家長可免費獲得子女的檢驗報告，倘你或家人有任何醫學疑難，可在辦公時間內致電社會醫學系（電話：819 9199），該系醫生將樂於爲你們解答。這項電話諮詢服務亦是免費的。

請　貴子弟將「家長同意書」及「家庭健康問卷」儘早帶回學校。

香港大學社會醫學系教授
賀達理醫生上

家長同意書

本人已經看過「南區學童健康調查致家長信」及明白該信內容。
本人明白所有個人資料，將會絕對保密，並只可用於醫學研究和統計分析。
本人明白參加該項調查，純屬自願

*本人　同意/不同意　子弟_______________參加身體檢查
（子弟姓名）

日期：___________________　　　家長/監護人簽署：___________________

*請刪去不適用者

| [ ][ ][ ][ ] - [ ][ ][ ] - [ ][ ][ ]
(請勿填寫此格)

學童驗身表格

姓　　名：________________

班　　級：________________

班　　號：________________

出生日期：____年____月____日

性　　別：☐男　　☐女

Measurements:

Item	Result
Height	________ cm.
Weight	________ kg.
CO	________ ppm.
Mini Wright	1. ________ lpm.
	2. ________ lpm.
	3. ________ lpm.

Examinations:

Item	✓ Completed	Results (circle the appropriate one)
History Check		1. Reliable 2. Probably Reliable 3. Doubtful 4. Invalid
Symptoms Now		1. Cough 2. Wheeze 3. Nasal discharge
Nasal		1. Discharge 2. Congested mucosa 3. Swollen Turbinate
Chest Shape		1. Normal 2. Abnormal
Auscultation		1. Rhonchi at rest 2. Rhonchi on forced expiration
Other Comments: (e.g. Chest shape, Air movement, conjunctivitis)		

APPENDIX 3

葵青區學童健康調查致家長信

各位家長：

由葵青區區議會支持的一項小學三至六年級學童健康調查計劃將於本年四月開始舉行。

調查的目的：

調查所得的資料，將有助區議會向政府作出有關保障及促進兒童健康的建議，同時家長亦可了解子女的健康狀況，調查工作將由香港大學社會醫學系教授賀達理醫生領導該系及兒科學系的一組醫生，護士及科研人員執行，本區數間學校獲邀參予這項計劃。

學校支持這項調查：

基於這項調查能爲葵青區區內兒童健康情況提供寶貴資料，校方樂意支持這項調查，並會作出適當的安排，以方便進行這項調查。

調查的內容：

這次調查，你的子女需填寫一份問卷。我們會爲你的子女量度身高、體重及肺功能。

在進行肺功能測驗時，你的子女需由一管道吹氣進入肺功能儀器內，我們會請他吸入一些無毒的葯物——組織胺（histamine），以測驗他的肺部是否有過敏的反應及其他不正常的情況。

組織胺測驗的功用及安全性：

有一小部份的兒童可能會對組織胺（histamine）產生過敏的反應，包括胸部感到緊迫和咳嗽，這些反應通常只是短暫的，我們會使用少量氣管擴張的葯物以消除這些反應。有部份兒童雖然他們沒有症狀和肺功能正常，但他們的肺部有氣管過敏症，如果能及早發現，可以用擴張氣管的葯物治療。這種測驗是十分安全的，在奧洲已進行過15,000次，未有出現過任何後遺症。去年有430名香港南區和葵青區的學童參加我們進行的檢驗，結果十分順利，並無任何後遺症。

我們需要家長的協助：

我們亦希望家長能提供有關子女健康狀況的資料，請協助我們填妥附上的允許子女參予這項調查的家長同意書和一份家庭健康問卷，並請將問卷及同意書裝入附上的信封內，封口後交子女帶回學校，檢查完成後，家長可免費獲得子女的檢驗報告，如我們發現你子女的肺功能不正常，我們亦會爲你提供治療的指導。如果你有任何問題，可於辦公時間內致電給我們（電話：819 9199）。

香港大學社會醫學系教授
賀達理醫生上

家長同意書

本人已經看過「葵青區學童健康調查致家長信」及明白該信內容。
本人明白所有個人資料，將會絕對保密，並只可用於醫學研究和統計分析。
本人明白參加該項調查，純屬自願

＊本人　同意/不同意　子弟_______________參加肺功能測驗（組織胺）
（子弟姓名）

如果你不願意讓你的子女參加組織胺（histamine）測驗，但願意讓他/她接受量度身高、體重。

請簽署（家長/監護人）：____________________

日期：____________________

＊請刪去不適用者

各位家長:

多謝你交回「家長同意書」，知道你不同意你的孩子參加健康檢查，我們感到十分失望。基於下列的原因，我們誠懇地請求你再次考慮讓你的孩子參加:

（一）這項調查，對你的子女至爲重要。我們會對你子女的健康狀況作出評估，你可以免費獲得子女的驗身報告，了解他的健康狀況。

（二）你的子女參加調查後，你便可以利用我們提供的免費電話諮詢服務。如果你或你的家人有任何有關醫學或健康的問題，我們的醫生會非常樂意爲你們詳細解答。

（三）曾參加過的孩子們都覺得這是一次有趣而又有教育性的經驗，希望你的子女不要錯過這次機會。簡單的身體檢查，不會使孩子感到不適。調查工作，將由本人領導下的社會醫學系及兒科學系的醫生、護士和科研人員進行，請放心。

（四）這項調查，對於你居住地區的兒童的健康亦是至爲重要，調查將會提供非常寶貴的資料，使保障及促進兒童健康服務的計劃能更有效地制定和執行。

（五）這項調查，不單得到區議會的資助和大力支持，還得到學校方面積極的合作。大多數家長已經同意參加，希望你也能加入。

（六）我們再次保證，一切個人資料，將會絕對保密。除了醫生、護士和科研人員外，不會有任何人知道你所供的資料。

爲己爲人，請協助我們，填妥附上的健康問卷及家長同意書，裝入附上的信封內，封口後交子女帶回學校轉交給我們。如有任何詢問，請電8199199。

即使你仍不願意讓子女參加身體檢查，我們仍請求你填妥問卷。

請儘早交回同意書及問卷。

祝健康快樂。

香港大學社會醫學系教授
賀達理醫生上

家長同意書

本人已經看過「葵青區學童健康調查致家長信」及明白該信內容。
本人明白所有個人資料，將會絕對保密，並只可用醫學研究和統計分析。
本人明白參加該項調查，純屬自願

* 本人　同意/ 不同意　子弟______________參加身體檢查
（子弟姓名）

日期: ____________　　家長/ 監護人簽署: ____________________

* 請刪去不適用者

HISTAMINE CHALLENGE TEST

1. Procedure

A. Start up and calibration

1. Turn on Vitalograph, printer will automatically say 'Please calibrate 'L'.
2. Check that the graph paper and stylet are in the correct position.
3. Read the temperature off the thermometer and make a horizontal line on the graph paper on the temperature correction scale at the point of the recorded temperature.
4. Do VC to 6L by pulling the writing arm to corrected 6L mark. Make sure the stylet returns to the start point.
5. Do FVC to 6L also by pulling the writing arm to the corrected 6L horizontal line, as in point 4.
6. Print the results and note if both FVC and VC read to 6L 0.01L. Calibration is complete if readings are acceptable.

B. Characteristics of acceptable tracings

1. The rising portion should be convex.
2. The plateau is reached smoothly.
3. The plateau can be maintained for at least 3 seconds.
4. At least 2, preferably 3 good readings should be within 5% of each other (within 1-2 squares apart).

C. Operation

Spirometry

1. Clear the previous data and key in height, age and sex of child. Ask child if he/she is asthmatic.
2. **Measure VC.** Show the mouthpiece to the child and tell him that after taking a deep breath, he should clamp his lips and teeth snugly around the mouthpiece and blow as hard as he can through it.
3. **Measure FVC**. Repeat point 2, but tell the child that he must take only one breath and blow it out as hard as possible and for as long as you tell him to do so.

N.B. Watch the tracing as he blows and encourage him to blow right to the end of the chart paper.

4. Record the FEV_1, if > 60% predicted, proceed. If <60% predicted, do a bronchodilator test (see IIb).
5. Using the table provided, determine the FEV_1 drop by 10% and the FEV_1 drop by 20% values and record both on the chart. Note, the end point is reached when the FEV_1 falls by ≥20% FEV_1.

Either,

Ia) Saline

1. Ask child to put his lips and teeth around the disposable mouthpiece on the nebulizer. Put a noseclip on the child's nose if necessary.
2. Using the nebulizer filled with saline solution, ask the child to inhale slowly from just less than FRC, squeeze the nebulizer, let the child breath in for 1-2 seconds to TLC, then hold breath for 3 seconds. Repeat twice more, then measure FEV_1 60 seconds after the last inhalation and record the value on the chart.

Histamine

1. Give first dose as per schedules (A for asthmatics, B for rest). Each dose should be given within 3 minutes of the previous one. Measure the FEV_1 60 seconds after the last or only inhalation. Use the best of 2 reproducible blows and record the value on the chart.
2. Continue by repeating the test, following the dosing schedule. Watch for and stop when the FEV_1 drop is ≥ 20% from the baseline.
3. When the FEV_1 end point is reached, or the dosing schedule has been completed, give two puffs of bronchodilator (Ventolin via Volumetric inhaler). This can be repeated for up to 6 puffs in 15 minutes, until the child feels comfortable.

OR

IIb) Bronchodilator Test

1. If baseline FEV_1 is <60% predicted use salbutamol via a volumetric inhaler, 2 puffs. Slow inhalation to TLC after actuating the aerosol, then hold breath for 10 seconds.
2. Repeat FEV_1 measurement, 10 minutes later.
3. Continue until FEV_1 increases by >15% from baseline.

HISTAMINE CHALLENGE TEST

Name .... Class .... OLD ID

School .... Session .... Class .... NEW ID

DOE: Y .... M .... D .... DOB: Y .... M .... D .... Sex ....

Age .... Height Cm Weight Kg

Asthma: Yes/No If yes, Time of last aerosol bronchodilator ....

Time of last oral bronchodilator ....

Spirometer No. Operator

A. Baseline Spirometry

FVC	FEV_1	% of predicted	FEV_1 drop of 10%

B. Saline Inhalation

Post saline spirometry: FEV_1

C. Histamine test (stop challenge when FEV_1 falls by >20%)

drop by 20%

A (asthma)

	Dose Hist. conc.	No. of Inhal.	FEV_1	Check
1.	0.3%	1		
2.	0.3%	1		
3.	0.6%	1		
4.	0.6%	2		
5.	2.5%	1		
6.	2.5%	2		
7.	2.5%	4		
8.	5.0%	4		
9.	5.0%	8		

B (non-asthma)

Dose Hist. conc.	No. of Inhal.	FEV_1	Check
0.6%	1		

$10\% < \triangle FEV_1 < 20\%$

YES (go to A3) NO

Dose Hist. conc.	No. of Inhal.	FEV_1	Check
0.6%	3		

$10\% < \triangle FEV_1 < 20\%$

YES (go to A5) NO

Dose Hist. conc.	No. of Inhal.	FEV_1	Check
2.5%	3		

$10\% < \triangle FEV_1 < 20\%$

YES (go to A7) NO

Dose Hist. conc.	No. of Inhal.	FEV_1	Check
5.0%	6		
5.0%	8		

APPENDIX 4

Appendix 4

Total rainfall, as recorded at the Royal Observatory from 1988 to 1992

	Total rainfall (mm)				
	Survey year				
Month	1988	1989	1990	1991	1992
January	1.0	23.9	47.5	28.7	40.0
February	11.9	2.7	195.7	8.2	142.8
March	40.6	47.8	29.9	51.5	242.4
April	82.4	201.1	257.6	34.7	492.2
May	115.2	771.9	102.4	60.9	602.3
June	296.9	137.5	448.1	371.7	532.8
July	327.4	237.9	268.0	293.6	358.1
August	505.7	218.0	150.1	302.3	97.7
September	109.9	228.1	409.9	178.7	63.1
October	61.8	15.2	100.7	294.3	30.9
November	25.6	20.3	36.9	2.7	10.1
December	106.6	40.2	0.1	11.8	66.4

Mean relative humidity, as recorded at the Royal Observatory from 1988 to 1992

	Mean relative humidity (%)				
	Survey year				
Month	1988	1989	1990	1991	1992
January	77	80	82	81	69
February	81	74	86	75	83
March	84	75	80	86	90
April	78	86	87	81	87
May	86	86	82	81	86
June	78	83	85	81	86
July	81	79	79	80	81
August	85	80	75	82	77
September	77	77	79	75	75
October	77	73	73	69	66
November	66	69	73	68	64
December	68	74	69	76	77

Air pollution and
respiratory health in
1993.