H N P D I S C U S S I O N P A P E R

Economics of Tobacco Control Paper No. 29

The Impact of Passive Smoking at Home on Respiratory Diseases:

Results from the Indonesia 2001 National Survey Data

Triasih Djutaharta, Abdillah Ahsan, Tata Tachman, Hendratno and Elizabeth Gilpin

June 2005

Tobacco Free Initiative
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Health, Nutrition and Population (HNP) Discussion Paper

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THE IMPACT OF PASSIVE SMOKING AT HOME ON RESPIRATORY DISEASES:

Results from the Indonesia 2001 National Survey Data

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Background Paper prepared for the World Bank Study on the Economics of Tobacco and Tobacco Control in Indonesia, with financial support from SIDA and US CDC/OSH. Completed May 2004, revised June 2005.

Abstract: This study uses raw data covering over 17,000 people from the 2001 National Socio-Economic Survey (NSES) and 2001 National Household Health Survey (NHHS), including 3621 children under 10 years of age, to investigate the relationship between respiratory diseases and exposure to secondhand cigarette smoke through living in a home where people smoke. An important finding is that children under 10 years of age who live in homes where 30 or more cigarettes are smoked each day are significantly more likely to have various respiratory diseases than children who live in smoke-free homes.

Keywords: tobacco, smoking, secondhand smoke, environmental tobacco smoke, cigarettes, Indonesia, tobacco policy, respiratory disease

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Table of Contents

List of tables

Appendix Tables

FOREWORD

In 1999, the World Bank published "Curbing the Epidemic: governments and the economics of tobacco control", which summarizes the trends in global tobacco use and the resulting immense and growing burden of disease and premature death. By 1999, there were already 4 million deaths from tobacco each year, and this huge number is projected to grow to 10 million per year by 2030, given present trends in tobacco consumption. Already about half of these deaths are in high-income countries, but recent and continued increases in tobacco use in the developing world is causing the tobacco-related burden to shift increasingly to low- and middle-income countries. By 2030, seven of every ten tobacco-attributable deaths will be in developing countries. "Curbing the Epidemic" also summarizes the evidence on the set of policies and interventions that have proved to be effective and cost-effective in reducing tobacco use, in countries around the world.

Tax increases that raise the price of tobacco products are the most powerful policy tool to reduce tobacco use, and the single most cost-effective intervention. They are also the most effective intervention to persuade young people to quit or not to start smoking. This is because young people, like others with low incomes, tend to be highly sensitive to price increases.

Why are these proven cost effective tobacco control measures –especially tax increases– not adopted or implemented more strongly by governments? Many governments hesitate to act decisively to reduce tobacco use, because they fear that tax increases and other tobacco control measures might harm the economy, by reducing the economic benefits their country gains from growing, processing, manufacturing, exporting and taxing tobacco. The argument that "tobacco contributes revenues, jobs and incomes" is a formidable barrier to tobacco control in many countries. Are these fears supported by the facts?

In fact, these fears turn out to be largely unfounded, when the data and evidence on the economics of tobacco and tobacco control are examined. The team of about 30 internationally recognized experts in economics, epidemiology and other relevant disciplines who contributed to the analysis presented in "Curbing the Epidemic" reviewed a large body of existing evidence, and concluded strongly that in most countries, tobacco control would not lead to a net loss of jobs and could, in many circumstances actually generate new jobs. Tax increases would increase (not decrease) total tax revenues, even if cigarette smuggling increased to some extent. Furthermore, the evidence show that cigarette smuggling is caused at least as much by general corruption as by high tobacco product tax and price differentials, and the team recommended strongly that governments not forego the benefits of tobacco tax increases because they feared the possible impact on smuggling, but rather act to deter, detect and punish smuggling.

Much of the evidence presented and summarized in "Curbing the Epidemic" was from high income countries. But the main battleground against tobacco use is now in low- and middle-incomes countries. If needless disease and millions of premature deaths are to be prevented, then it is crucial that developing counties raise tobacco taxes, introduce comprehensive bans on all advertising and promotion of tobacco products, ban smoking in public places, inform their

citizens well about the harm that tobacco causes and the benefits of quitting, and provide advice and support to help people who smoke and chew tobacco, to quit.

In talking to policy-makers in developing countries, it became clear that there was a great need for country-specific analytic work, to provide a basis for policy making, within a sound economic framework. So the World Bank and the Tobacco Free Initiative of the World Health Organization (as well as some of the WHO regional offices and several other organizations, acting in partnership or independently) began to commission and support analysis of the economics of tobacco and tobacco control in many countries around the world.

The report presented in this Economic of Tobacco Discussion Paper makes a valuable contribution to our understanding of the issues and likely economic impact of tobacco control in a specific country setting. Our hope is that the information, analysis and recommendations will prove helpful to policy makers, and help result in stronger policies to reduce the unnecessary harm caused by tobacco use.

Joy de Beyer

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INTRODUCTION

Tobacco use is one of the top ten causes of death among adults. Many smokers greatly underestimate the risks to their health and lives, in part because diseases caused by smoking usually take decades to develop. The number of smokers and smoking prevalence in Indonesia appears to be increasing. Smoking prevalence among males 10 year and older rose from 51.3 percent in 1995 to 54.5 percent in 2001 (ICBS 2001). Over the same period, smoking prevalence among teenage girls aged 15-19 years increased from 0.7 percent (Suhardi 1997) to 0.9 percent (Sirait 2002).

Cigarette smoke is not only dangerous for smokers but also for people around them (passive or involuntary smokers). There is an extensive international literature documenting the health risks of exposure to secondhand smoke. For example, Janson, Christer et al. studied 7,882 adults (age 20-48 years) who had never smoked in 16 European countries and found that passive smoking in the workplace was significantly associated with all types of respiratory symptoms and current asthma (odds ratio 1·90 [95% CI 0·90 to 2·88], Janson, Christer et al. 2001).

The Indonesia National Socio-Economic Survey (NSES) 1999 data show that 57.2 percent of households include one or more smokers. Household smoking prevalence is highest among the lowest income families: 55.6 percent for households with low income and 50.8 percent for households with high income (Adioetomo et al. 2001). Members of poor families are more likely to live with a smoker than members of better-off families.

The 1995 Indonesia Household Health Survey (SKRT) indicates that the main cause of death after diseases of the circulation system in Indonesia is disease of the respiratory system (Ministry of Health, 2000, for deaths at all ages). The 2001 National Health Survey (Surkesnas) shows the same patterns as in 1995 (Djaja et al. 2002).

According to the California Environmental Protection Agency (CEPA 1997) environmental tobacco smoke (ETS) (also called secondhand smoke) can cause (a) impaired development and sudden infant death (b) respiratory illness, (c) cancers, and (d) cardiovascular effects. The respiratory diseases related to ETS exposure are acute lower respiratory tract infections in children (bronchitis and pneumonia), asthma induction and exacerbation in children, chronic respiratory symptoms in children, eye and nasal irritation in adults, and middle ear infection in children.

A large study in California (CEPA 1997) showed that ETS exacerbates asthma (RR=1.6 to 2). Relative risks for respiratory effects in children were also large: RR was 1.62 for middle ear infection and 1.5 to 2 for lower respiratory disease in young children. Asthma was induced in 0.5 to 2 percent of ETS-exposed children (RR=1.75 to 2.25). Other studies support these findings (e.g. Cook and Strachan 1999). The odds ratio for respiratory illness and symptoms was 1.2 if either parent smoked, and was higher for pre-school than school-aged children. Further, Mannino et al. 1996 found that environmental tobacco smoke exposure at home is an important predictor of increased morbidity of children. Children who were exposed to environmental tobacco smoke had a higher incidence of acute respiratory illness. Janson et al. 2001 found that

passive smoking increased the likelihood of experiencing respiratory symptoms. A literature review of empirical research by the National Health and Medical Research Council (1997) found a clear association between passive smoking and lower respiratory infection. Ashley and Rerrence (1998) comment on the public health and economic impact of children's exposure to environmental tobacco smoke. Janghorbani and Bafti document an increase in frequency of respiratory illness among Iranian infants and children exposed to secondhand smoke.

These data indicate that children are especially sensitive to the respiratory effects of ETS exposure, and the home is the most important site of this exposure. Coughing is one symptom of respiratory illness infection. According to the 2001 Indonesia National Social Economic Survey (Susenas), 26 percent of the urban population and 25 percent of the rural population complained about their health in 2001. Among them, 40 percent suffered from coughing, 41 percent from flu/cold and 33 percent from fever (CBS, 2001). A higher percentage of children than adults suffered from these symptoms.

The time children spend at home and the extent to which people smoke in homes make home the main source of ETS exposure for children. Children spend much of their time at home, and often gather near to other family members who are at home. About 92 percent of Indonesian smokers report smoking at home while together with their family (ICBS, 2001), and about half smoke 11-20 cigarettes per day. Data from 1995 were similar: 91 percent of smokers (89.3 percent in rural areas and 93.4 percent in urban areas) said they smoked in their homes. This was the case in all provinces in Indonesia with the highest percentage in North Sulawesi (94.2 percent) and the lowest percentage in Bengkulu (81.3 percent).[1]

The effect of tobacco smoke is exacerbated by other sources of air pollution in Indonesian homes that also increase the risk of respiratory diesases. According to the Indonesian Family Life Survey (1997)[2], 50 percent of households use biomass fuel like firewood or charcoal for cooking. The percentage of households that use firewood/charcoal as their main source of energy varies from 47.1 percent (in North Sumatra) to 71.7 percent (in Lampung). The exceptions are DKI Jakarta and West Java with 1.74 percent and 28.8 percent respectively.

The present study investigates the relationship between secondhand tobacco smoke exposure at home and respiratory illness among children in Indonesia. It helps quantify the effects of passive smoking, and should be considered in decisions about tobacco control policy in Indonesia.

STUDY OBJECTIVE AND CONCEPTUAL FRAMEWORK

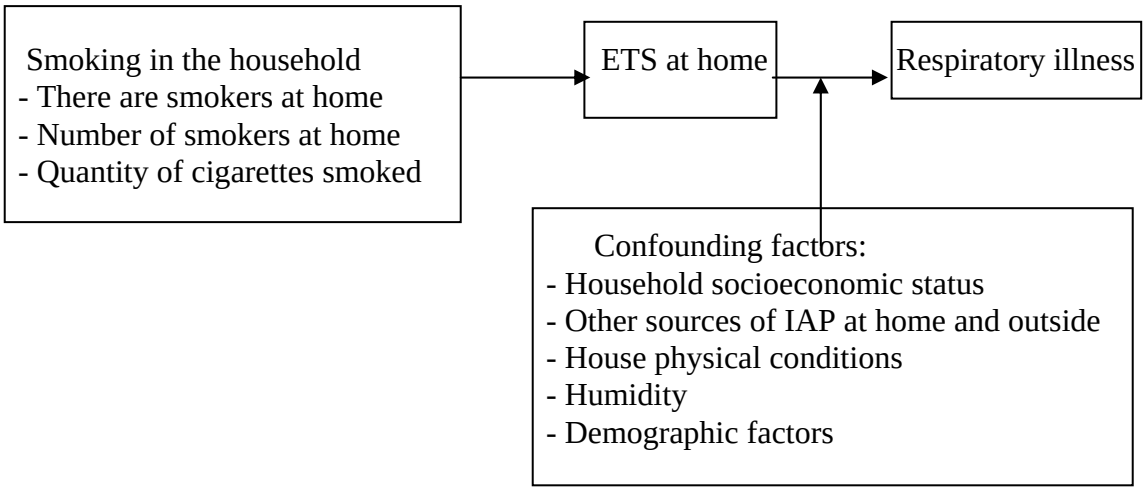
OBJECTIVE

The main objective was to study the impact of exposure to tobacco smoke at home on respiratory illness in children.

[1] Computed from raw data National Socioeconomic Survey 1995

[2] Calculated from raw data from the Indonesia Family Life Survey 1997.

CONCEPTUAL FRAMEWORK



Note:
ETS = environmental tobacco smoke, also called secondhand smoke
IAP = indoor air pollution

As indicated in the diagram above, smoking within the home produces ETS which may be in part responsible for respiratory illnesses in children. However, other factors might also play a role.

METHODOLOGY

THE MODEL

According to EPA (1997) and several other studies in the literature, environment tobacco smoke can affect individual health status. ETS contains a complex mixture of chemicals that are generated during the burning and smoking of tobacco products. Chemicals present in ETS include systemic toxicants such as hydrogen cyanide and sulfur dioxide, mutagens and carcinogens such as benzo(a)pyrene, formaldehyde and 4-aminobiphenyl and reproductive toxicants nicotine, cadmium and carbon monoxide.

Santerre and Neun (1996), using a health economics approach, stated that health could be considered in a similar way to other good and services. This view takes the concept of an individual health production process, in which endowments, lifestyle, environmental factors, socioeconomic status and medical care produce health. Demographic factors (age and sex) also affect health status.

Health status reflects the level of health at a point in time. Health status or another indicator of morbidity such as respiratory diseases or ear infections among children is a dependent variable in the model. The general form of the health production function is as follows:

$$Morbidity = f\,(ETS, life\ style, endowment, environment, SE\ status\ )$$

Where the independent variables are:

ETS is environment tobacco smoke
Life style factors are smoking and diet
Endowment is measured by educational attainment
Environment is a vector consisting of environmental factors inside the home
SE status is socioeconomic status.

DATA SOURCES

The study uses raw data from the 2001 National Socio-Economic Survey (NSES) and 2001 National Household Health Survey (NHHS). The NHHS is a sub-sample of the NSES. According to the Health Research and Development Board, Health Department (*Balitbangkes*) (2001), NSES was conducted in early 2001 by the Central Board of Statistics, and the NHHS was conducted by the Agency for Health Research and Development (Balitbangkes) of the Ministry of Health.

National Socio-Economic Survey (NSES)

The 2001 NSES was conducted throughout Indonesia (except in Maluku and Daerah Istimewa Aceh). Several questions in the NSES asked about health characteristics, smoking, cooking fuel, housing conditions and health expenditure. The NSES was designed by the Central Board of Statistics (BPS), and *Balitbangkes* helped design the health module questionnaire.

Experienced interviewers trained by the BPS collected the NSES data. They visited every household sampled. They attempted to question each household member. General household information was collected from the household head, husband/wife or other household member who was able to answer the questions.

There were several steps in the NSES sample design. For urban areas, the first step was selection of blocks using linear systematic sampling from the block census. The second step was selection of 16 households from each selected census block using linear systematic sampling.

National Household Health Survey (NHHS)

The 2001 NHHS is a baseline survey that was integrated with the 2001 NSES. The NHHS consists of three parts, one of which was a morbidity study on a sample of 6,272 households comprising 19,280 people (*Balitbangkes* 2002). Teams, consisting of a physician and a medical examiner, conducted health examinations as part of the NHHS. Surveyors were trained medical workers, such as doctors and midwives.

All members of households in the sample received a general medical check up. This enabled information to be collected about unperceived and perceived illness through interviews, physical examination and laboratory tests. Interviews also gathered medical histories from birth, and asked detailed questions about perceived illness during the previous month. Diseases were diagnosed using the International Code for Diseases, ICD-10.

Merged Dataset

The NHHS was conducted in 26 provinces (excluding only Aceh, Maluku and Irian Jaya). The data sets were merged, identifying respondents by codes for province, district, sub district, village**,** urban-rural classification, block census number, sample code number and household sample number. The core module of the NSES included 54,892 households and 277,432 people. The merged data set from both the NHHS and NSES contained 17,060 observations (individual respondents), including 3,621 children under the age of 10 years.

Unit of Analysis

The unit of analysis is each respondent from the merged data from the 2001 NSES and NHHS. The main text of this report examines children under the age of 10 years. Results for persons 10 years of age and older are also shown in Appendix B which tabulates disease status for the entire population.

VARIABLES

Independent variables

The independent variables used in the analyses of children < 10 years of age are described below, and Table 1 summarizes the categories of the variables defined for the statistical analyses.

Environment Tobacco Smoke (ETS). According to the NSES 2001, smokers stated that they smoked at home, including when other household members were in the house. The survey did not ask how many cigarettes they smoked at home, but did ask each current smoker aged 10 years or more "How many cigarettes did you consume in the last 24 hours?" We used the total quantity of cigarettes smoked by all household members in the past 24 hours as a proxy measure of ETS at home. The hypothesis is that people living with smokers have a higher probability of getting respiratory diseases than people living in households that do not include any smokers.

Balanced Diet. Good eating habits are assumed to be negative correlated with respiratory diseases. A balanced diet was measured by household expenditure (purchases by self and gifts) on several kind of the food including sources of animal protein (milk, fish, meat and eggs), as well as vegetables, fruit and pulses.

Endowments. Educational attainment was used as the indicator of endowments. We assumed that more educated people are healthier than less educated people (Santerre and Neun 1996). The survey did not gather information on children younger than 10 years. For the analysis, we created an education attainment variable based on years of schooling of the parents.

Environment. Healthy housing conditions provide a good environment for all household members. Lubis et al (1996) found that a bad housing environment can lead to respiratory diseases. They used several environment parameters, such as floor, wall and ceiling, population density and cooking fuel. Soesanto et al. (2000) add other indicators of housing environment: natural light and ventilation. Humidity inside the house, conditions in the kitchen and bedroom,

and the population density in the household are the key environmental variables used in the present study.

Humidity. Bad ventilation of the house will worsen the air conditions and humidity inside the house. A humidity variable was developed based on whether the widest floor of the house was made of earth or the widest wall was made of wood or bamboo.

Bedroom condition. Bad ventilation in the bedroom (where people spend many hours) may increase the likelihood of respiratory diseases. The "bedroom condition" variable was based on answers to questions about bedroom ventilation and natural light.

Kitchen condition. If the household uses fuel that causes high levels of smoke/indoor pollution, household members who spend a lot of time in the kitchen or at home are more likely to suffer from respiratory diseases (Lubis et al 1996). A kitchen variable was developed using information about the type of cooking fuel used and whether the kitchen was well ventilated or not.

Population density. According to Lubis et al. (1996), high population density inside the house can increase the risk of young children developing coughs. In our study, a density variable considered whether the dwelling floor area was less than or greater than 8 m^2/capita.

Demographic factors.Two demographic factors were included in the analyses.

Age and Sex. Stansfield and Shepard (1991) suggested that the incidence of acute respiratory infections is inversely related to age. We assumed that younger children are more vulnerable to respiratory diseases, and created an appropriate variable categorizing age. Males were compared to females.

Socio-economic factors. Two socio-economic indicators were considered.

Income. There tends to be a positive relationship between household income and health. According to Thabrany (1999), a study in Indonesia found that health status improved at higher incomes. However Santerre and Neun (1996) report that a literature survey showed mixed empirical results about the relationship between health and income. Our study uses household expenditure as a proxy for household income.

Urban (Location). We hypothesized that urban residents were more likely to have respiratory diseases because of living in areas of higher population density and worse air pollution.

Dependent Variables

The dependent variables in the analysis measure morbidity due to respiratory diseases and middle ear infections. Composite variables were created by combining various ICD-10 codes (see Appendix A). Analyses of children under the age of 10 years used the following dependent variables:

- Specific respiratory diseases (***respk***): J12-J18, J40-J47,

- Advanced respiratory diseases (***respall***): J00-J03, J05-J06, J10-J18, J20-J22, J32, J35, J40-J47, and
- Respiratory and middle ear diseases (***morb_chk***): J12-J18, J40-J47, H65-H67.

A complete summary of all variables (dependent and independent) examined for the analyses for children under 10 years of age is included in Table 1.

Table 1: List and Categories of all Variables

Variables Name	Description of variable
Respiratory diseases	Based on ICD-10 Code
Respk	Specific Respiratory diseases J12-J18, J40-J47
Respall	Advanced respiratory diseases J00-J03, J05-J06, J10-J18, J20-J22, J32, J35, J40-J47
morb_chk	Specific respiratory diseases & middle ear infection: variable ***respk*** and H65-H67
ETS	This variable was estimated as total household daily cigarettes consumption.
Qty0	None
Qty1	1-14 cigarettes/household/day
Qty2	15-29 cigarettes/household/day
Qty3	30+ cigarettes/household/day
Balanced diet	Proportion of expenditures on healthy food, to total food expenditure. Healthy food consists of fish, meat, egg & milk, vegetables, pulses and fruit.
Foodab	The percentage of healthy food to total food expenditure < 20%=1, >20%=0
Sex of child	
Sex	If male sex=1, if female sex=0
Location *Urban*	If respondent lives in urban area then urban =1, else urban=0
HH income	This variables estimated using total household expenditures
Inc1, Inc,2..., Inc5	Quintile 1, Quintile 2, …, Quintile 5
Education*	
Educai	Household head or wife has <6 years of schooling or cannot write=1, otherwise=0
Educa1	Household head has < 6 years education or cannot read=1, otherwise=0
Age of respondent	
Age0	Age <1 years
Age1_5	Age 1 year to <5 years
Age5-10	Age 5 to <10 years
Kitchen condition	
Kitchd1	Household uses wood/coal as a fuel and kitchen has bad ventilation=1, otherwise=0
Humidity of house	
Humid	House widest floor is made of earth, or widest wall is made of wood or bamboo=1, otherwise=0
Bedroom condition*	
Bedd1	Bedroom has poor ventilation and not enough natural light coded=1, otherwise=0
Bed4	Bedroom has poor ventilation or not enough natural light and only one bedroom coded 1, otherwise=0.
Population density at home	
Floord	Dwelling floor area is < 8 m^2/capita=1, >8 m^2/capita = 0

* Analyses used different codings for these variables.

STATISTICAL METHODS

The relation of the dependent variables to ETS exposure was examined univariately using Pearson's chi-square statistics. To account for possible confounders, the relation between the dependent and independent variables was then examined using logistic regressions from the STATA regression estimation program. All the independent variables were included in the model. To further verify the findings, a stepwise procedure was followed in which the program runs a series of multiple regressions, each time deleting one of the predictor variables. The weakest predictor, with the biggest absolute p value, is chosen for deletion each time. Rotherford and Choe (1993) called this the *method of backward deletion*. Independent variables related to dependent variables with pr<0.15 are reported as significant.

RESULTS

DISEASE PREVALENCE

A general description of diseases in Indonesia for the entire population based on the NHHS 2001 is presented in Appendix B. It shows that acute respiratory diseases are the most common of all diseases among children and that younger children are more affected than older ones. For children, chronic respiratory diseases were the fourth most common disease group.

In the merged NHHS and NSES 2001 data, there are 17,060 individual observations, of which 70% (11,981) lived in households with at least one smoker. Of the 3,621 respondents under the age of 10, almost 70 percent (69.5%, 2,516) lived in households with at least one smoker and 1,105 (30.5%) lived in a household in which no one smoked, as shown in Table 2.

A detailed distribution of smoking-related diseases according to whether or not the household was smoke-free is presented in Table 2. The ICD-10 codes defining each category are shown, and Appendix A gives a description of each individual code. The proportion of children with respiratory diseases (*respall*) was slightly greater among children who lived in households with smokers than in smoke-free households (43% compared to 40%). For the *respall* or *earall* definitions of respiratory diseases, 45% of children in households with smokers and 42% in smoke-free households were diagnosed. Therefore, children who lived in households with smokers had a slightly higher probability of being sick than children who lived in smoke-free households.

Table 2: Distribution of tobacco-related diseases among children <10 years by household smoking status, NHHS and NSES, 2001

	Household Smoking Status			
Group of diseases	**Smoke-free HHs**		**Smoking HHs**	
	Cases	%	Cases	%
Total observations	1,105	30.5	2,516	69.5
Respiratory disease				
Respall J00-J03, J05-J06, J10-J18, J20-J22, - J32, J35, J47	443	**40.1**	1,080	**42.9**
Respk J12-J18**,** J40-J47	36	**3.3**	79	**3.1**
Ear infection				
- ***earall*** H65-H75, H80-H83	28	2.5	75	3.0
- ***eark*** J65-J67	25	2.3	64	2.5
Respiratory diseases & middle ear infection				
- ***respall*** or ***earall***	457	41.4	1,112	44.2
- ***respk*** or ***eark***	60	**5.4**	138	**5.5**
Tuberculosis				
- Any kind of TB (***tball***) (A15-A19)[1)]	5	0.5	10	0.4
- Tuberculosis (***tbk***) (A15-16)	4	0.4	8	0.3
Any kind of disease related to tobacco use				
- ***respall*** or ***earall*** or ***tball*** or other groups	462	41.8	1,121	44.6
- ***respk*** or ***eark*** or ***tbk*** or other groups	66	6.0	149	5.9

EXPOSURE TO ETS

As mentioned above, about 30% of children under age 10 years lived in smoke-free households. Around 44% lived in a household were they were exposed to between 1 and 14 cigarettes per day, another 20% were exposed to 15-29 cigarettes per day, and 4% were exposed to smoke from more than 30 cigarettes per day.

Table 3 shows cross tabulations between the number of cigarettes consumed in the household and the main dependent variables analyzed, and suggests a clear relationship between the quantity of cigarettes smoked and risk of respiratory diseases among children. Among children less than 10 years old living in households whose members smoked 30 or more cigarette per day, 7.4% had respiratory diseases (***respk***) compared to 3.2% of children who lived in households with no members who smoked or where fewer than 30 cigarettes were smoked per day (Pearson chi^2, pr=0.024). For advanced respiratory disease (***respall***), there was more disease among children in homes with intermediate levels of consumption, and those in households where 30 or more cigarettes were smoked showed a higher rate but overall statistical significance was not achieved (Pearson chi^2, pr=0.517). Finally, for specific respiratory diseases combined with ear infections (***morb_chk*)**, children living in households that smoked 30 or more cigarettes per day had over twice the prevalence (12.1%) of these diseases than children in households where 0-29 cigarettes were smoked (about 5%, Pearson chi^2, pr: 0.005).

Table 3: Number of cigarettes smoked per day by household members and dependent variables of interest in children <10 years

Household exposure per day	Total N	***respk***		***respall***		***morb_chk***	
		N with	%	N with	%	N with	%
No cigarettes	1108	36	3.2	444	40.1	60	5.4
1-<15 pieces	1609	43	2.7	689	42.8	82	5.1
15-<30 pieces	755	25	3.3	322	42.6	38	5.0
30 or more pieces	149	11	**7.4**	68	45.6	18	12.1

RELATIONSHIP OF INDEPENDENT VARIABLES TO DISEASE STATUS

The association of all the independent variables with each of the dependent ones is examined in the next set of tables.

Table 4 shows that except for sex, all the independent variables examined in this analysis showed a significant univariate relationship to respiratory diseases (***respk***). However, income did not show a consistent relationship; there is no explanation for why the middle quintile should show lower rates of respiratory diseases for children than households with lower or higher incomes. In the logistic regression analysis, which adjusts for all the other variables in the model, exposure to 30 or more cigarettes per day was still significant. Other variables significantly related to the dependent variable were diet, income (although not consistently), education of the household head or wife, child's age, and the population density in the household. Age (younger children) and household density (<8m^2 capita) showed the strongest relationships in the multivariate analysis. The backward stepwise procedure confirmed these findings.

The results shown in Table 5 for advanced respiratory diseases (***respall***) were, in general, not as strong as for ***respk***. In the multivariate analysis, ETS exposure was not significant. Quintile 3 of income again showed significantly less disease, and the overall income relationship was again inconsistent. Age was clearly the most important variable, with younger children most at risk for advanced respiratory diseases. Only one other factor was independently significant, kitchen condition. These results were confirmed by the backward stepwise procedure.

The logistic regression results for the combination of respiratory diseases and ear infections (***morb_chk***) are shown in Table 6. Children in homes with more than 30 cigarettes smoked per day showed significantly more specific respiratory diseases/ear infections than children with no ETS exposure in the home, after adjusting for all the other variables in the model. Adding ear infections appears to have increased the strength of the ETS variable. Diet was also significant both univariately and in the multiple logistic regression, as were age, kitchen conditions, humidity and population density. Again, age appears to be the variable most strongly related to disease. These relationships were again confirmed by the backward stepwise procedure.

Table 4: Dependent variable: respiratory diseases (*respk*) in children age <10 years

	N	Univariate Analysis			Logistic Regression			
		N with	%	p-value	Odds Ratio	Std. Err.	Z	P value
ETS exposure (cigarettes/day)								
None	1108	36	3.25	**0.024**	1.0			
1-14	1609	43	2.67		0.776	0.18	-1.08	0.282
15-29	755	25	3.31		0.957	0.27	-0.16	0.876
30+	149	11	**7**.38		1.990	0.76	1.79	**0.073**
Diet								
>20% healthy food:total food exp	3268	95	2.91	**0.005**	1.0			
<20% healthy food:total food exp	353	20	5.67		1.559	0.43	1.62	**0.104**
Sex								
Female	1771	51	2.88	0.320	1.0			
Male	1850	64	3.46		1.207	0.23	0.98	0.329
Location								
Rural	2362	84	5.56	**0.074**	1.0			
Urban	1259	31	2.46		0.888	0.22	-0.48	0.631
Income								
Quint 5	619	15	2.42	**0.018**	1.0			
Quint 4	737	27	3.66		1.335	0.45	0.85	0.393
Quint 3	788	13	1.65		0.555	0.22	-1.42	**0.143**
Quint 2	794	30	3.78		1.138	0.41	0.36	0.718
Quint 1	683	30	4.39		1.289	0.48	0.68	0.496
Education of HH head or wife (Educai)								
>6 years of schooling	2178	56	2.57	**0.011**	1.0			
<6 years of schooling or cannot write	1443	59	4.09		1.343	0.27	1.45	**0.146**
Age (years)								
Age 5-<10	1551	31	2.00	**0.000**	1.0			
Age 1- <5	1380	51	3.70		1.879	0.44	2.71	**0.007**
Age <1	690	33	4.78		2.516	0.65	3.58	**0.000**
Kitchen conditions								
Good ventilation or does not use coal/wood	3165	92	2.91	**0.015**	1.0			
Poor ventilation and uses coal/wood	456	23	5.04		1.144	0.30	0.51	0.614
Humidity of house, widest floor								
Not earth or bamboo	1694	38	2.24	**0.003**	1.0			
Earth or bamboo	1927	77	4.00		1.322	0.30	1.32	0.220
Bedroom condition (Bedd1)								
Good ventilation or enough natural light	3279	99	3.02	**0.096**	1.0			
Poor ventilation and not enough natural light	342	16	4.68		1.115	0.330	0.37	0.712
Population densition in home								
>8m2/capita	2805	74	2.64	**0.001**	1.0			
<8m2/capita	816	41	5.02		1.677	0.35	2.47	**0.013**
Pseudo R2					**0.055**			

Table 5: Dependent variable: advanced respiratory diseases (*respall*) among children < 10 years.

	N	Univariate Analysis			Logistic Regression			
		N with	%	p-value	Odds Ratio	Std. Err.	Z	P value
ETS exposure (cigarettes/day)								
None	1108	444	40.1	0.517	1.0			
1-14	1609	689	42.8		1.123	0.09	1.43	0.153
15-29	755	322	42.6		1.138	0.11	1.29	0.197
30+	149	68	45.6		1.281	0.23	1.36	0.173
Diet								
>20% healthy food:total food exp	3268	1365	41.8	0.280	1.0			
<20 % healthy food:total food exp	353	158	44.8		1.029	0.12	0.24	0.810
Sex								
Female	1771	756	42.7	0.454	1.0			
Male	1850	767	41.5		0.953	0.06	-0.71	0.477
Location								
Rural	2362	1002	42.4	0.546	1.0			
Urban	1259	521	41.4		1.033	0.08	0.40	0.686
Income								
Quint 5	619	254	41.0	**0.00**7	1.0			
Quint 4	737	311	42.2		1.037	0.12	0.32	0.747
Quint 3	788	292	37.1		0.814	0.10	-1.75	**0.080**
Quint 2	794	362	45.6		1.127	0.14	0.99	0.323
Quint 1	683	304	44.5		1.044	0.14	0.33	0.743
Education of HH head (Educa1)								
>6 years of schooling	2656	1098	41.3	0.145	1.0			
<6 years of schooling or cannot read	965	425	44.0		1.061	0.09	0.74	0.461
Age (years)								
Age 5-<10	1551	566	36.5	**0.000**	1.0			
Age 1- <5	1380	616	44.6		1.391	0.11	4.33	**0.000**
Age <1	690	341	49.4		1.688	0.16	5.60	**0.000**
Kitchen conditions								
Good ventilation or does not use coal/wood	3165	1306	41.3	**0.011**	1.0			
Poor ventilation and uses coal/wood	456	217	47.6		1.188	0.13	1.58	**0.114**
Humidity of house, widest floor								
Not earth or bamboo	2617	1073	41.0	**0.037**	1.0			
Earth or bamboo	1004	450	44.8		1.071	0.09	10.82	0.411
Bedroom condition (Bed4)								
Good ventilation and enough natural light	3369	1407	41.8	0.185	1.0			
Poor ventilation or not enough natural light, or only 1 bedroom	252	116	46.0		1.037	0.14	0.26	0.794
Population densition in home								
>8m2/capita	2805	1163	41.5	0.176	1.0			
<8m2/capita	816	360	44.1		1.092	0.09	1.06	0.291
Pseudo R2					**0.013**			

Table 6: Dependent variable: specific respiratory diseases/ear infections (*morb_chk*) among children <10 years

	N	Univariate Analysis			Logistic Regression			
		N with	%	p-value	Odds Ratio	Std. Err.	Z	P value
ETS exposure (cigarettes/day)								
None	1108	60	5.42	**0.005**	1.0			
1-14	1609	82	5.10		0.871	0.16	-0.77	0.441
		38	5.03				-	
15-29	755				0.853	0.19	0.71	0.477
30+	149	18	12.11		2.037	0.62	2.33	**0.020**
Diet								
>20% healthy food:total food exp	3268	164	5.19	**0.000**	1.0			
< 20% healthy food:total food exp	353	34	9.63		1.631	0.35	2.30	**0.021**
Sex								
Female	1771	92	5.19	0.479	1.0			
Male	1850	106	5.73		1.111	0.16	0.71	0.477
Location								
Rural	2362	147	6.22	**0.006**	1.0			
Urban	1259	51	4.05		0.808	0.16	-1.11	0.267
Income								
Quint 5	619	27	4.40	**0.033**	1.0			
Quint 4	737	37	5.02		1.012	0.27	0.04	0.965
Quint 3	788	35	4.44		0.858	0.24	-0.58	0.560
Quint 2	794	46	5.75		0.969	0.27	-0.11	0.911
Quint 1	683	53	7.76		1.237	0.35	0.75	0.453
Education of HH head or wife (Educai)								
>6 years of schooling	2178	109	5.00	**0.132**	1.0			
<6 years of schooling or cannot write	1443	89	6.17		0.962	0.15	-0.25	0.806
Age (years)								
Age 5-<10	1551	64	4.13	**0.009**	1.0			
Age 1-<5	1380	90	6.52		1.614	0.27	2.82	**0.005**
Age <1	690	44	6.38		1.600	0.33	2.30	**0.022**
Kitchen conditions								
Good ventilation or does not use coal/wood	3165	155	4.90	**0.000**	1.0			
Poor ventilation and uses coal/wood	456	43	9.43		1.412	0.28	1.72	**0.085**
Humidity of house, widest floor								
Not earth or bamboo	1694	68	4.01	**0.000**	1.0			
Earth or bamboo	1927	130	6.75		1.306	0.23	1.54	**0.124**
Bedroom condition (Bedd1)								
Good ventilation or enough natural light	3279	169	5.15	**0.010**	1.0			
Poor ventilation and not enough natural light	342	29	8.48		1.259	0.28	1.02	0.306
Population density in home								
>8m2/capita	2805	134	4.78	**0.001**	1.0			
<8m2/capita	816	64	7.84		1.460	0.24	2.29	**0.022**
Pseudo R2					**0.038**			

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

SUMMARY

Of the 3,621 children less than ten years old, nearly 70% lived in households where at least one person smoked. In most of the smoking households, fewer than 15 cigarettes were smoked each day in the home. However, 6% of all children younger than 10 years old lived in homes where 30 or more cigarettes were smoked each day, implying high exposure to secondhand smoke.

Respiratory diseases (***respall***) were common in children (42%), including acute respiratory infections (29%). These diseases were slightly more common in children who lived in a household with at least one smoker compared to smoke-free households (43% vs. 40%). Regardless of whether or not there were smokers in the household, the occurrence of specific respiratory diseases (***respk***) or of this variable combined with ear infections (***morb_chk***) were similar. However, all diseases were more common in households where 30 or more cigarettes were smoked per day than in smoke-free households: (***respk***) 7.4% vs 3.2%, (***respall***) 45.6% vs. 40.1%, and (**morb_chk**), 12.1% vs. 5.1%. Only ***respall*** showed intermediate levels in households where 1-29 cigarettes were smoked per day.

When adjusting for many other factors that might also influence disease, the logistic regressions with specific respiratory diseases (***respk***) as the dependent variable found significant relationships for households where 30 or more cigarettes were smoked per day (elevated compared to smoke-free households). The child's age (babies and young children compared to those 5-<10 years), population density (all $p<0.10$), and unhealthy food ($p<0.15$) were also significant in the multivariate analysis. While all the other variables except sex showed significant univariate relationships with the dependent variable, household income, humidity of the house, and bedroom condition were not significant in the multivariate analysis.

The logistic regression results were less strong for ***respall.*** ETS exposure was not statistically significant, and only age of the child showed a meaningful significant relationship to this dependent variable.

Because ***morb_chk*** is a composite of ***respk*** and ear infections, the logistic regression results for this variable were somewhat similar, but in general less significant than when ***respk*** was analyzed separately. However, the relationship between ETS exposure and ***morb_chk*** was stronger ($p=0.02$) than for ***respk***, suggesting a stronger relationship of ear infections to ETS. Other significant factors were indoor air pollution from cooking, child's age, whether the household bought healthy food and population density in the home.

An important limitation to this study is the accuracy of the proxy measure of ETS exposure. Most likely, not all of the cigarettes smoked by household smokers were smoked inside the home in the presence of the children. Thus, it is very likely that lower levels of exposure than indicated from our analyses are actually associated with the development of respiratory diseases in

children. Another potential limitation is the accuracy in the diagnosis and reporting of the diseases considered.

CONCLUSION

The results of our analyses suggest that ETS exposure is an important independent factor in the development of respiratory infections and possibly ear infections in children under 10 years of age, even after adjusting for other contributing factors.

POLICY RECOMMENDATIONS

Educate the public on the fact that secondhand smoke increases the risk of illness, and protect people from exposure to secondhand smoke.

This study adds data from Indonesia, consistent with international evidence, that children exposed to secondhand smoke in their homes have a higher probability of respiratory diseases (ICD 10: J12-J18 and J40-J47) than children living in homes where no one smokes. Children who become ill are likely to be absent from school and to need healthcare, sometimes at considerable cost to their families. The public should be educated and informed about the dangers of secondhand smoke.

According to the EPA (1997), secondhand smoke contains irritants and systemic toxicants such as hydrogen cyanide and sulfur dioxide, and mutagens and carcinogens such as benzo(a)pyrene, formaldehyde and carbon monoxide. Over 50 compounds in cigarette smoke have been identified as carcinogens and six as developmental or reproductive toxicants. Non-smokers – especially children – should be protected from exposure to secondhand smoke.

Spread the message that smoke-free homes are healthier.

A house offers protection from rain and other elements, and is also a place to rest and relax with family members. Smoke-free homes provide a healthier environment, and this knowledge has begun to change smoking behavior dramatically in the United States, where most smokers no longer smoke in their own homes. Unfortunately, most smokers in Indonesia still smoke at home. This endangers other people who are exposed to their cigarette smoke. It should be suggested to smokers in Indonesia that they are responsible for protecting their non-smoking family members from cigarette smoke exposure.

Strengthen enforcement of the smoke-free area law.

Government decree No.19 of 2003 determined that public places such as healthcare facilities, schools, children's playgrounds, religious places and public transportation should be smoke-free areas. However, low monitoring and enforcement mean that the regulation has not had all of its intended effect. The government should enforce the law by fining people who smoke in smoke-free areas and accompany enforcement with efforts to promote community awareness of the law and its rationale. Woollery et al (2000) noted that clean indoor-air law enforcement protects non-

smokers and also leads to a significant reduction in smoking prevalence and average cigarette consumption among continuing smokers.

Reduce the number of smokers and the amount they smoke.

Reducing the number of smokers and the amount they smoke, and deterring children and youth from starting to smoke will also improve health outcomes by reducing the population's exposure to ETS. According to World Bank (1999), effective and cost-effective non-price measures to decrease smoking are: publishing the results of research related to the dangers of smoking, banning all tobacco advertising and promotion, educating people about the dangers of smoking and prohibiting smoking in public and working places. Warner et al (1995) and World Bank (1999) showed that the tobacco excise tax is an important policy tool for deterring young people from starting to smoke. Young people are especially responsive to price increases, so higher prices (and taxes) deter potential new smokers and also decrease cigarette consumption among established smokers.

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APPENDIX A – ICD-10 CODES FOR RESPIRATORY DISEASES AND EAR INFECTIONS

The ICD-10 codes for respiratory diseases and ear infections are listed below.

Acute upper respiratory infections (Mannino et al. 1996)
- J00 Acute nasopharyngitis (common cold)
- J01 acute sinusitis
- J02 Acute pharingitis
- J03 Acute tonsillitis
- J05 Acute obstructive laryngitis (croup) and epiglotitis
- J06 Acute upper respiratory infections of multiple and unspecified sites

Influenza and Pneumonia (Mannino et al. 1996)
- J10 Influenza due to identified influenza virus
- J11 Influenza, virus not identified
- J12 Viral pneumonia, not elsewhere classified
- J13 Pneumonia due to Streptococcus pneumonia
- J14 Pneumonia due to Haemophilus influenza
- J15 Bacterial pneumonia, not elsewhere
- J16 Pneumonia due to other infectious organisms, not elsewhere classified
- J17 Pneumonia in diseases classified elsewhere
- J18 Pneumonia, organism unspecified

Other acute lower respiratory infections (Mannino et al. 1996, EPA 1997)
- J20 acute bronchitis
- J21 Acute bronchiolitis
- J22 Unspecified acute lower respiratory infection

Other diseases of upper respiratory tract (Mannino et al. 1996)
- J32 Chronic sinusitis
- J35 Chronic diseases of tonsils and adenoids

Chronic lower respiratory diseases (Mannino et al. 1996, EPA 1997)
- J40 Bronchitis, not specified as acute or chronic
- J41 Simple and mucopurulent chronic bronchitis
- J42 Unspecified chronic bronchitis
- J43 Emphysema
- J44 Other chronic obstructive pulmonary diseases
- J45 Asthma (National Health and Medical Research Council 1997)[3]
- J46 Status asthmaticus

[3] Many studies carried out in different populations, using a variety of study designs and different methods of measuring the presence and severity of asthma symptoms have, with few exceptions, shown a link between asthma symptoms in childhood and passive smoking.

- J47 Bronchiectasis

Ear infections (EPA (1997)
- H65 Non-suppurative otitis media
- H66 Suppurative and unspecified otitis media
- H67 Otitis media in diseases classified elsewhere

Tuberculosis (TB)
- A15 Respiratory tuberculosis, bacteriologically and histologically confirm
- A16 Respiratory tuberculosis, not confirmed bacteriologically or histologically
- A17 Tuberculosis of nervous system
- A18 Tuberculosis of other organs
- A19 Miliary tuberculosis

In the analysis, these diseases are classified into five groups, to create dependent variables:
(a) specific respiratory diseases (*respk*) ICD-10 J12-J18 dan J40-J47,
(b) advance respiratory diseases (*respall*) J00-J3, J5-J6, J0-J8, J0-J2, J32, J35, J40-J47,
(c) respiratory and middle ear diseases (*morb_chk*) J12-J18, J40-47, H65-H67,
(d) specific TB (*tbk*) A15-A16, and
(e) advanced TB (*tball*) A15-A19.

The first three of the above dependent variables were used in the analyses of children under 10 years of age.

APPENDIX B - GENERAL DESCRIPTION OF POPULATION DISEASE PREVALENCE

Data from the NHHS 2001 shows that the most common diseases were diseases of the oral cavity, salivary glands, and jaws (dental and oral disease, ICD-10: K00-K14), with 60% of the sample diagnosed (Table B-1). Disease related to smoking was also frequent: 24% of the sample had an acute respiratory infection (acute respiratory infections, influenza and pneumonia and other acute lower respiratory infections), 16% was diagnosed with hypertension, and 10% with a chronic respiratory infection (bronchitis, emphysema, asthma and other chronic obstructive pulmonary diseases).

Table B-1: Ten most frequently diagnosed diseases, by gender, % of NHHS 2001 data

No.	Kind of Disease	ICD-10	Male	Female	M+F
1	Diseases of dental and oral (D&O)	K00-K14	59.1	60.7	59.9
2	Visual and refraction disturbance	H52-H54	29.5	31.7	30.7
3	**Acute respiratory infection (ARI)**	**J00-J22**	**23.1**	**24.0**	**23.6**
4	Blood-forming disorder & the immune mechanism (BDI)	D50-D89	18.0	22.5	20.3
5	**Hypertension**	**I10-I15**	**14.7**	**17.4**	**16.2**
6	Other digestive system diseases	K20-K93	12.0	17.0	14.6
7	Others eye diseases	H00-H51,H55-H59	12.0	13.1	12.6
8	Skin diseases	L00-L99	11.8	11.8	11.8
9	Joint or reciprocal diseases	M00-M99	10.8	12.5	11.7
10	**Chronic respiratory infection (CRI)**	**J40-J99**	**10.2**	**9.5**	**9.8**
	Any kind of disease*		86.6	88.6	87.7
	Total samples		9,240	10,040	19,280

Source: Institute of Health Research and Development, 2002 (NHHS 2001)
Note: * At least one disease in the ICD-10

The percentage of males and females with acute respiratory infections and chronic respiratory diseases were similar. Slightly more women were diagnosed with hypertension: 17%, compared to 15% among males.

The pattern of disease varies by age. Over 55% of adults (15 years and older) had dental and oral disease. The incidence of several other disease groups rose with age: visual and refraction disturbance, hypertension, other eye diseases, and joint and reciprocal diseases. For example, the proportions for hypertension were 6% for 25-34 years old, 15% for 35-44 years old and 43% for 55^{+} years old (Table B-2).

Table B-2: Ten most frequently diagnosed diseases, by age group, NHHS 2001 data

No	Disease Group	ICD-10	Age Groups								
			< 1	**1-4**	**5-14**	**15-24**	**25-34**	**35-44**	**45-54**	**55+**	**Total**
			In Percentage								
1	Diseases of dental and oral	K00-K14	2.2	1.9	33	56.7	75.3	82.4	89.7	90.8	59.9
2	Visual and refraction disturbance	H52-H54	0	0.2	8.1	13	21.7	42.3	74.7	82.5	30.7
3	**Acute respiratory infection**	**J00-J22**	38.7	42.2	28.8	19.6	19.8	19.3	19.1	17.6	**23.6**
4	Disorders of blood & the immune mechanism	D50-D89	41.1	33	23.2	14.4	14.6	15.9	17.3	26.7	20.3
5	**Hypertension**	**I10-I15**	0	0	0	0.5	6.1	14.7	27.6	42.9	**16.2**
6	Other digest system diseases	K20-K93	4.4	3.6	6.1	14.9	20	22.1	19.8	18.5	14.6
7	Others eye diseases	H00-H51, H55-H59	2.6	2.8	3.1	4	7.5	13.1	22.2	48	12.6
8	Skin diseases	L00-L99	12.3	12.4	11.3	10.4	11	11.9	13.8	13.3	11.8
9	Joint or reciprocal diseases	M00-M99	0	0.1	0.4	3.1	9.4	16.1	25.9	39.6	11.7
10	**Chronic respiratory infection**	**J40-J99**	6.3	8.7	11.6	9	8.7	9.1	9.3	12	**9.8**
	Sample total		270	1,708	4,170	3,101	3,054	2,736	1,945	2,296	19,280

Source: Institute of Health Research and Development 2002

By contrast, children were much more likely to have acute respiratory diseases, with incidence falling with age. For example, the 39% of children younger than one year and 42% of 1-4 year olds were diagnosed with an ARI incident in the past month, but this declined to 18% for adults aged 55 and older.

The tenth most frequent disease group was chronic respiratory infection. For children aged 14 or younger, this was the fourth most frequent disease group, and incidence was 6% for infants under one year, 9% for 1-4 year olds and 12% for 5-14 year olds. The biggest proportion was among 5-14 year olds and 55^{+} year olds (12% for both).

Table B-3 shows the incidence of tobacco-related diseases according to whether or not there was a smoker in the household.

Table B-3: Distribution of tobacco related diseases by household smoking status, NHHS 2001

	Smoke-free HHs				Smoking HHs			
Group of diseases	All obs.		Children		All obs.		Children	
	Cases	%	Cases	%	Cases	%	Cases	%
Total observations	5,079	100.0	1,105	100.0	11,981	100.0	2,516	100.0
Respiratory disease (Resp)								
- ***Respall*** J00-J03, J05-J06, J10-J18, J20-J22, J 32, J35, J47	1,461	**28.8**	443	**40.1**	3,407	**28.4**	1,080	**42.9**
- ***Respk*** J12-J18, J40-47	187	3.7	36	3.3	424	3.5	79	3.1
Ear infection (Eark)								
- ***earall*** H65-H75,H80-H83	89	1.8	28	2.5	210	1.8	75	3.0
- ***eark*** J65-67	55	1.1	25	2.3	135	1.1	64	2.5
Respiratory diseases & middle ear infection								
- ***respall*** or ***earall***	1,517	29.9	457	**41.4**	3,517	29.4	1,112	**44.2**
- ***respk*** or ***eark***	239	4.7	60	5.4	548	4.6	138	5.5
Tuberculosis								
- Any kind of TB (***tball***) (A15-A19)[1)]	43	0.9	5	0.5	111	0.9	10	0.4
- Tuberculosis (***tbk***) (A15-16)	40	0.8	4	0.4	101	0.8	8	0.3
Burn								
- burnk (T20-T32) [2)]	2	0.0	2	0.2	3	0.0	0	0.0
Eye								
- Group eyek (H25-28)	322	6.3	4	0.4	598	5.0	4	0.2
Infertility								
- infertile (N91-92, N46, N97)	69	1.4	-	-	146	1.2	-	-
Diseases related early birth								
- earlyb (p05, P07, P21-22, P95)	-	-	-	-	-	-	-	-
Neoplasm								
- neoplasm (C00-14, C15-16, C22, C25, C32-34, C53, C56, C64, C67, C92-93)[3)]	2	0.0	-	-	0	0.0	-	-
Circulatory diseases								
- circul (I10, I20-I25, I60-71, I73-78)[4)]	615	12.1	-	-	1,218	10.2	9	0.4
Any kind of disease related to tobacco use								
- ***Respall*** or ***earall*** or ***tball*** or other groups	2,144	42.2	462	41.8	4,763	39.8	1,121	44.6
- ***Respk*** or ***Eark*** or ***tbk*** or other groups	1,031	20.3	66	6.0	2,127	17.8	149	5.9

Note: [1)] A17 no observations [2)] T20, T23 and T26-32 no observation
[3)] Observation available only C32 and C34, [4)] I60-63, I65-67, I71,I74-77 no observation
Source: Institute of Health Research and Development, 2002 (NHHS 2001)

Table B-4 shows that 70% of children (less than 10 years) and 67% of women (10 or older) lived in households with one or more smoker (HH-S), implying a high prevalence among women and children of exposure to secondhand smoke (also called environmental tobacco smoke, ETS).

Table B-4: Distribution of sample who live with/without smokers at home, Indonesia 2001

Status of Specific Population	Children age <10		Women age 10+		Population 10+		All population	
	No.	%	No.	%	No.	%	No.	%
Live without smoker	1,108	30.6	2,306	33.0	3,990	29.7	5,098	29.9
Live with smoker	2,513	**69.4**	4,682	**67.0**	9,449	**70.3**	11,962	**70.1**
Total sample	3,621	100	6,988	100	13,439	100	17,060	100

Source: merged data of NHHS and NSS, Indonesia 2001

Table B-5 shows that 42% children younger than 10 years old had respiratory diseases (***respall***). The most frequent disease in the ***respall*** grouping for children was acute upper respiratory infection (29%) followed by pneumonia (9%). Among women and girls aged 10 years or older, 25% had respiratory diseases (***respall***). The most frequent disease for this group was acute respiratory disease (17%) followed by pneumonia (5%). This is fairly similar to the data for children less than 10 years. For the full sample, only 1% was diagnoses with tuberculosis (***tball***).

Table B-5: Incidence of respiratory diseases by disease group and population, Indonesia 2001

No	Description	Children <10 years		Women 10+ years		All population 10+ years	
		Freq.	%	Freq.	%	Freq.	%
I	**Specific Respiratory diseases (*respk*)**						
1	J12-J18	21	0.6	9	0.1	15	0.1
2	J40-J47	95	2.6	221	3.2	481	3.6
	I1, I2	115	3.2	230	3.3	496	3.7
II	**Advance respiratory diseases (*respall*)**						
1	Acute upper respiratory infections (J00-J06),	1,049	29.0	1,171	16.8	2,165	16.1
2	Peumonia (J10-J18)	341	9.4	369	5.3	682	5.1
3	Other acute lower respiratory infections (J20-J22)	40	1.1	51	0.7	102	0.8
4	J32 & J35	166	4.6	100	1.4	197	1.5
5	J40-J47	95	2.6	221	3.2	481	3.6
	II1, II2, II3, II4 , II5	1,523	42.1	1,759	25.2	3,345	24.9
III	**Respiratory diseases & middle ear infection (*morb_chk*)**						
1	*Respk* (I)	115	3.2	230	3.3	496	3.7
2	H65-H67	89	2.5	41	0.6	101	0.8
	III1, III2	198	5.5	267	3.8	589	4.4
	Total respondents	3,621	100.0	6,988	100.0	13,439	100.0
	All ages	Freq.		%			
IV	**Specific TB (*tbk*)** A15-A16	141		0.83			
V	**Advance TB (*tball*)** A15-A19	154		0.9			
	Total respondents	17,060		100.0			

Source: Merged raw data, Indonesia NHHS and NSES 2001

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