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Secondhand Smoke Exposure among 18-month Infants

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ABSTRACT

Objectives: This study provides SHS exposure data in-utero and after birth when children were at 18 months, 36 months, and 66 months old, and it identifies risk factors for the early childhood SHS among 18-month-old infants living in smoker and non-smoker households.

Study design: The data come from the Taiwan Birth Cohort Study (TBCS), a longitudinal survey of a birth cohort born in 2005. This study used the survey wave when children were 18 months old (N = 18,845) for statistical analysis of early childhood SHS exposure. Logistic regression was used to identify the risk factors of the SHS exposure.

Results: Approximately 62% of the 18-month-old infants lived in a household with at least one smoker, with the father being the smoker in 84% of those households. Among these infants living in a smoker household, 70% were exposed to SHS and 36% were exposed to heavy SHS in utero, and the prevalence was approximately 66% and 17% after birth for SHS and heavy SHS, respectively. The number and the existence of smokers in the household, parents' smoking status, father's educational attainment, and being a first born baby are strong predictors of early childhood heavy SHS exposure.

Conclusions: Encouraging families to have a smoke-free home environment, empowering women to ensure their perspectives and rights are embedded into tobacco control efforts, and educating families about the health risks from childhood SHS exposure, especially among people living in households with smokers, will protect nonsmoking adults and children from SHS exposure.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- A unique dataset, which randomly selected newborns from all live births in 2005, tracks SHS exposure in utero and when the children were 18 months, 36 months, and 66 months old.
- Sample size is large, over 19,000 children for all waves.
- The response rate is high (>92%) for all waves.
- Parents or primary caregivers may underreport infant's SHS due to lack of awareness or social desirability bias.

INTRODUCTION

Secondhand smoke (SHS) puts nonsmoking adults and children at higher risk of premature death, illness, and other adverse effects. The health risk from SHS is especially substantial among children given that their lungs are still developing. Newborns exposed to SHS, either in utero or after birth, have higher risk of premature birth, low birth weight, and sudden infant death syndrome, and children exposed to SHS have higher risk of acute respiratory illness, middle ear infections, bronchi, reduced lung function, and asthma development.[1-3]

The home is a major setting for SHS exposure. Children, particularly children of preschool ages, are most likely to be exposed to SHS at home given that very young children spend most of their time in the home and smoking restrictions in the home are usually rare.[4] The existence of smoking household members serves as a strong predictor for SHS exposure among children.[5,6] Findings from the global Youth Tobacco Survey conducted by the World Health Organization (WHO) indicated that approximately 44% of youths worldwide are exposed to SHS at home, 47% of whom have at least 1 parent who smokes.[7]

This study uses birth cohort data, a longitudinal survey of a birth cohort born in 2005 and provides the prevalence of SHS exposure in-utero and after birth for infants and young children at 18 months, 36 months, and 66 months old. In addition, this study investigates the profile differences between the 18-month-old infants who were exposed to heavy SHS and those who were not, and it identifies risk factors of heavy SHS exposure for those infants living in smoker versus non-smoker households, aiming to explore potential socio-demographic disparities associated with the early childhood SHS exposure.

METHODS

Data

Data come from the Taiwan Birth Cohort Study (TBCS), a longitudinal survey of a birth cohort born in 2005 in Taiwan. In the baseline year of 2005, TBCS used a two-stage stratified random sampling design and drew the study sample from the population-based birth database (National Birth Report Database) with an 11.7% sampling rate, resulting in a nationally representative cohort of 24,200 newborn individuals born in 2005. Among those eligible newborns, 21,248 infants completed a baseline survey at 6 months of age with a response rate of 87.8%. These infants were subsequently recruited as cohort members. Three waves of follow-up surveys were conducted when the infants and young children were at 18 months, 36 months, and 66 months of age, with response rates of 94.9%, 93.7%, and 92.8%, respectively.

The surveys were conducted via face-to-face interviews with either the mother or a primary caregiver providing the information. According to the 18-month survey, 98% of the respondents are mothers, 1.23% are primary caregivers, and 0.76% are both mothers and primary caregivers. Among the primary caregivers, the majority of them (90%) are fathers or grandparents. The surveys were reviewed and approved by the Directorate-General of Budget, Accounting, and Statistics, Executive Yuan, Republic of China. This study was reviewed by the Institutional Review Board at National Taiwan University Hospital.

This study uses 4 waves of the TBCS, when the infants and young children were 6 months, 18 months, 36 months, and 66 months old, to provide a time trend of SHS exposure across 4 time periods (in utero, 18 months, 36 months, and 66 months).

The 6 month wave provided retrospective information regarding the women's SHS exposure during their pregnancy. The 18-, 36-, and 66-month waves provided information regarding the young children's SHS exposure. However, the 6-month wave did not provide information on the children's SHS exposure.

The sample sizes are 21,248, 20,172, 19,910, and 19,721 for the 6-month, 18-month, 36-month, and 66-month waves, respectively. To provide the prevalence of SHS exposure in-utero and after birth, this study includes the respondents who consistently answered 6-month, 18-month, 36-month, and 66-month survey waves, and that leads in the sample size equaling 18,845.

Among those respondents who answered all the survey waves, this study uses the 18-month wave, the first wave of the TBCS including children's SHS information conducted between 2006 and 2007 for statistical analysis of early childhood SHS exposure.

The *in-utero SHS* is coded as "1" if the mother answered "1-2 days per week", "3-5 days per week", or "almost every day" to the question "During your pregnancy, did anyone smoke anywhere in front of you?" and "0" if the mother answered "never". The *in-utero heavy SHS* is coded as "1" if the mother answered either "almost every day" or "3-5 days per week" to that question and "0" if the mother answered "1-2 days per week", "less than 1 day per week", or "never".

The *childhood SHS* is coded as "1" if the mother or primary care giver answered "occasionally", "often", or "every day" to the question "How often is your baby exposed to secondhand smoke?" and "0" if the mother answered "never". The *heavy childhood SHS* is coded as "1" either "every day" or "often" to that question and "0" either "never" or "occasionally".

Parent's smoking status was "1" if one answered "yes" to the question "did you smoke during the past month?", and "0" otherwise. If a smoker smoked over 20 cigarettes a day, she or he was defined as a heavy smoker, otherwise not a heavy smoker. The respondents were asked "has the baby ever been diagnosed with asthma by a doctor?", and which was used to describe children's health condition related to SHS

exposure. Smoker household was coded 1 if any parent or other household members smoked and 0 if none of them smoked.

In the statistical analysis, all variables, including characteristics of the parents, children, and household, were measured when the child was 18 months except for the parents' age at birth of child (answered at 6 months) and asthma in the child (measured at 36 months).

Statistical methods

Descriptive Analysis

The sample was classified into two groups: young children living in a smoker household and those living in a non-smoker household. The crude proportion of the in-utero and heavy childhood SHS exposure at 18 months, 36 months, and 66 months old was provided for all children, those in smoker and nonsmoker households alike.

Summary statistics for outcome (heavy early childhood SHS exposure) and covariates (parents' characteristics, child's characteristics, and household characteristics) are provided for the 18-month infants in both smoker and nonsmoker households.

Univariate associations of each covariate with heavy and non-heavy early childhood SHS exposure were tested with Chi-square tests for categorical variables and ANOVA for continuous variables.

Statistical Analysis

This study used logistic regression to estimate the odds of heavy early childhood SHS exposure for two groups (infants living in a smoker household and infants living in a nonsmoker household), separately. This approach identifies the risk factors associated with heavy early childhood SHS exposure, and it

captures potential differences in the associations between heavy early childhood SHS exposure and covariates among infants living in smoker and nonsmoker households.

All statistical analyses were conducted by SAS version 9.3.

RESULTS

Trends of childhood SHS exposure

In general, the proportion of young children who were exposed to heavy SHS was 26.1% in utero, and it declined significantly after birth to 11.6%, 12.1%, and 9.5% when the children were 18 months, 36 months, and 66 months old, respectively (Figure 1).

When the sample was divided into those who live in smoker versus nonsmoker households, the trend presents similar patterns between the two subsamples (the heavy SHS prevalence declined significantly after birth). The percentage of young children exposed to heavy SHS is consistently high for those living in smoker households.

[INSERT FIGURE 1]

Baseline summary statistics

Among the 18-month infants, 61.8% lived in a smoker household and 37.8% lived in a nonsmoker household. The average age was 36.5 years for fathers and 29.9 years for mothers. Educational attainment was higher for parents living in nonsmoker households than for those living in smoker households. Approximately half of the infants (47%) had the father as the only smoker in the household, 0.5% had the mother as the only smoker, 4.9% had both parents as smokers, and 46.5% had neither parent as a smoker. Similarly, among infants living in smoker households, 76% had the father as the only smoker, 7.9% had the mother as the only smoker, and 14% had other family member as the only smoker. On average, smoking fathers smoked approximately 15 cigarettes per day, and smoking mothers smoked approximately 9 cigarettes per day (Table 1).

[INSERT TABLE 1]

Among those infants, 52% were boys and 50% were first born children. On average, 55.2% of the infants were exposed to SHS, with 66% exposed to SHS in a smoker household and 37.7% exposed to SHS in a non-smoker household. A total of 11.6% of the infants were exposed to heavy SHS, with 17.3% exposed to heavy SHS from living in a smoker household and 2.3% exposed from living in a nonsmoker household. Among the infants, 3.1% were diagnosed with asthma. On average, family income for infants living in nonsmoker households (<30000: 6.3%, 30,000-100,000: 74.6%, >100,000: 18.9) was higher than that for smoker households (<30,000:14.6%, 30,000-100,000:77.2%, >100,000: 7.7%). The average number of smokers living in a smoker household with infants was 1.4.

Bivariate analysis

Results from bivariate analyses (Table 2) indicate that heavy SHS was significantly associated with parental characteristics such as the parents' age, education level, employment status, smoking status, and smoking intensity (all $p < 0.01$). Heavy SHS was significantly associated with the infant's birth order ($p<0.01$).

[INSERT TABLE 2]

Household characteristics such as family income, smoking status, and number of smokers in the household were found to be significantly associated with heavy SHS exposure (all $p<0.01$).

Multivariate analysis

The results from multivariate logistic regression (Table 3) indicate that among all of the 18-month infants, the presence of a smoker in the household increased the likelihood for them to be exposed to heavy SHS (OR 3.48, 95% CI 2.89 to 4.20). The more smokers present in the household, the more likely they are to be exposed to heavy SHS (OR 1.47, 95% CI 1.40 to 1.55). The older the mother is, the less likely child

is to be exposed to heavy SHS (age 30-34, OR 0.83, 95% CI 0.70 to 0.97; age >=35, OR 0.75, 95% CI 0.61 to 0.91). The higher the father and mother's educational status is, the less likely the child is to be exposed to heavy SHS (father education: senior high, OR 0.75, 95% CI 0.66 to 0.85; junior college, OR 0.56 95% CI 0.47 to 0.67; college and above, OR 0.37, 95% CI 0.29 to 0.47; mother education: senior high, OR 0.80, 95% CI 0.70 to 0.92; junior college, OR 0.70, 95% CI 0.58 to 0.83). Being a first born child is associated with decreased likelihood of heavy SHS exposure (OR 0.74, 95% CI 0.67 to 0.82).

[INSERT TABLE 3]

After dividing the infants into those living in smoker versus nonsmoker households, parental characteristics such as age of mother (age 30-34, OR 0.83, 95% CI 0.70 to 0.99; age >=35, OR 0.74, 95% CI 0.60 to 0.91) and education of father (senior high, OR 0.74, 95% CI 0.65 to 0.84; junior college, OR 0.55, 95% CI 0.46 to 0.66; college and above, OR 0.32, 95% CI 0.25 to 0.43) and mother (senior high, OR 0.80, 95% CI 0.70 to 0.92; junior college, OR 0.64, 95% CI 0.53 to 0.77) are significantly associated with the heavy early childhood SHS exposure for those living in smoker households but not among those living in nonsmoker households. Among infants living in a smoker household, the subgroup of infants having both smoker parents have significant higher likelihood to be exposed to heavy SHS compared to their counterparts (OR 1.62, 95% CI 1.30 to 2.00). The mother's employment status was found to be significantly associated with increased SHS exposure for infants in a smoker household (OR 1.18, 95% CI 1.06 to 1.32) but decreased SHS exposure for infants in nonsmoker households (OR 0.46, 95% CI 0.31 to 0.68). Being a first born child was found to be associated with decreased likelihood of SHS exposure for infants living in either a nonsmoker (OR 0.62, 95% CI 0.44 to 0.87) or smoker household (OR 0.75, 95%CI 0.67 to 0.83).

DISCUSSION

To our knowledge, this is the first study using a birth cohort data and investigating SHS exposure in utero and among young children at different ages under 5 years old. This study uses a unique dataset, the Taiwan Birth Cohort Survey (TBCS) data, which randomly selected newborns from among all live births in 2005, and tracks SHS exposure in utero and when the children were 18 months, 36 months, and 66 months old.

Our results indicate that among the 18-month-old infants, 61.8% of them lived in a household with at least one smoker, with the father being the smoker in 84% of those households. Among these infants living in a smoker household, 70.4% were exposed to SHS and 36.2% were exposed to heavy SHS in utero, and the prevalence was approximately 66% and 17% after birth for SHS and heavy SHS, respectively. The number of smokers in the household, the existence of smokers in the household, the father's educational attainment, parents both smokers, and being a first born baby are strong predictors of a child's heavy SHS exposure.

These results confirm previous studies in East Asia indicating that most childhood SHS may come from the father and other household members, whereas 76% of infants living in a smoker household have father being the only smoker, and 14% have other family member and 0.7% have mother being the only smoker [5,8] These results indicate the urgent need to keep homes smoke-free to protect children from SHS exposure. Indeed, banning smoking in the home is found to be associated with a significant reduction in urinary cotinine to creatinine ratio in infants.[9-12] However, smoking restrictions in homes are not mandated by legal regulations, and the voluntary restriction of smoking is usually rare. Efforts are needed to

encourage Taiwanese families to adopt their own policy of restricting smoking in the home setting.

Taiwan is similar to many other Asian countries in that the familial values are deeply influenced by Confucianism, with an expectation of respecting the elderly and males to maintain the patriarchal family. This philosophy of Confucianism and patriarchy embedded in Chinese familial values may cause married women and children to be hesitant to change the smoking behavior of their male household members or to ask male smokers to smoke outside of the home.[13,14] Therefore, in addition to encouraging families to have a smoke-free home environment, there is a crucial need to empower women to ensure that their perspectives and rights are embedded in tobacco control efforts to protect not only themselves but also their children from SHS exposure.

Previous studies have indicated that smoke-free legislation in public places can spill over to the home setting through creating a norm of not smoking around nonsmokers.[15-18] Indeed, a few studies found that the comprehensive smoke-free laws enacted in 2009 in Taiwan reduced adult nonsmokers' SHS exposure in the home and even increased smoking cessation.[19,20] The enforcement of smoke-free environments in many public places may further reduce women and children's SHS exposure at home.

The results indicated that several factors are significantly associated with heavy early childhood SHS exposure, which allows the specific groups to be targeted by interventions to be identified, for example households with smokers, households with more than one smoker, both parents smoke, parents with lower educational attainment, mothers of younger age, and non-first-born children. More educational interventions and resources need to be aimed at these target groups to reduce early childhood SHS exposure from their household smokers through education about the health risks from SHS exposure.

A potential limitation this study has is that parents or primary caregivers may underreport infant's SHS due to lack of awareness or social desirability bias. Nevertheless, in our sample, 55.2% of primary caregivers indicated that their children were exposed to SHS, and this prevalence is higher than previously found in Taiwan.[21,22] Another concern regarding systematic bias in childhood SHS exposure may arise if underreporting occurs in a certain demographic or socioeconomic subgroup and not others. However, a study using multiple SHS exposure measures, both self-reporting and serum cotinine level, indicated that exposure patterns by demographic characteristics were similar among those two measures.[23]

CONCLUSIONS

This study investigated the early childhood SHS exposure among 18-month-old infants, a subgroup of young children spending most of their time at home and most likely to be exposed to household SHS through their household members. The results indicate that most early childhood SHS comes from the father and other household members, whereas the smoking rate for women in this study setting is very low. Encouraging families to maintain a smoke-free home environment, empowering women to ensure their perspectives and rights are embedded into tobacco control efforts, and educating families about the health risks from childhood SHS exposure, especially among children living in households with smokers, will protect nonsmoking women and their children from SHS exposure.

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Contributors' Statement:

Kai-Wen Cheng: Dr. Cheng conceived the topic, designed the statistical plans, and drafted the article.

Wan-Lin Chiang: Ms. Chiang did the actual statistical run and conducted the editing during the manuscript preparation.

Tung-liang Chiang: Dr. Chiang initiated the collaborative project, provided critical comments, and revised the draft article.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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Conflicts of Interest: The authors declare that they have no conflict of interest.

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Figure 1. Prevalence of early childhood SHS exposure in-utero and afterbith in smoker and non-smoker households. The proportion of young children who were exposed to heavy SHS declined significantly after birth. The percentage of children exposed to heavy SHS is consistently higher for those living in smoker households than for those living in nonsmoker households.

Table 1 Baseline summary descriptive data (measured when the children were 18 months old), % and mean±SD

Variables	Number of Observations	All households	Nonsmoker households	Smoker households
Total	18845	N=18845	n=7130	n=11651
Parent's characteristics				
Father's age (years)		36.5±13.8	35.7±9.1	36.9±15.6
<25	475	2.5	0.7	3.6
25-29	3440	18.3	12.0	22.1
30-34	6592	35.0	38.3	33.1
>=35	8338	44.2	49.0	41.2
Mother's age (years)		29.9±4.8	31.4±4.3	28.9±4.9
<25	2707	14.4	5.7	19.6
25-29	6117	32.4	25.9	36.5
30-34	6760	35.9	45.4	30.1
>=35	3261	17.3	23.0	13.8
Father's education level				
Junior high or below	2500	13.3	5.7	17.8
Senior high	7454	39.6	24.9	48.6
Junior college	4134	21.9	25.1	20.0
College and above	4623	24.5	44.0	12.7
Missing	134	0.7	0.3	0.8
Mother's education level				
Junior high or below	2637	14.0	7.3	18.1
Senior high	7526	39.9	27.0	47.8
Junior college	4797	25.5	30.1	22.6
College and above	3852	20.4	35.5	11.3
Missing	33	0.2	0.1	0.2
Parents' employment status				
Father employed	18053	95.8	97.7	95.1
Missing	182	1.0	0.1	0.6
Mother employed	11475	60.9	65.9	57.8
Missing	108	0.6	0.1	0.5
Parents' smoking status				
Only father smokes	8854	47.0	0.0	76.0
Only mother smokes	87	0.4	0.0	0.7
Both parents smoke	923	4.9	0.0	7.9
None of them smoke	8760	46.5	100.0	14.0
Missing	221	1.2	0.0	1.4
Parents' smoking intensity (smokers)				
Father's cigarettes per day	9782	15.2±9.5	-	15.2±9.4
Mother's cigarettes per day	1052	9.3±6.8	-	9.3±6.8
Children's characteristics				
Child being a boy	9912	52.6	52.8	52.5
First-born child				
Yes	9468	50.2	50.2	50.2
No	9367	49.7	49.8	49.7
Missing	10	0.1	0.0	0.1
Children's SHS exposure				
General SHS exposure				
Never	8441	44.8	62.3	34.0
Ever	10401	55.2	37.7	66.0
Missing	3	0.0	0.0	0.0
SHS intensity				
Non-heavy SHS exposure	16659	88.4	97.7	82.7
Heavy SHS exposure	2183	11.6	2.3	17.3
Missing	3	0.0	0.0	0.0
Child ever diagnosed with asthma	586	3.1	3.2	3.0
Household characteristics				
Family income				
<30,000	2195	11.6	6.3	14.6
30,000-100,000	14332	76.1	74.6	77.2
>100,000	2249	11.9	18.9	7.7
Missing	69	0.4	0.2	0.4
Number of smokers in the family	18821	0.9±1.0	0.0±0.0	1.4±0.9

Table 2 Early childhood SHS exposure by household, parental, and children's characteristics (%)

Characteristics	Total (n)	Non-heavy SHS	Heavy SHS	p-value
Total	18845	88.4	11.6	
Parent's characteristics				
Father's age				<.0001
<25	475	78.5	21.5	
25-29	3440	85.4	14.6	
30-34	6592	89.6	10.4	
>=35	8338	89.2	10.8	
Mother's age				<.0001
<25	2707	80.2	19.8	
25-29	6117	86.3	13.7	
30-34	6760	91.6	8.3	
>=35	3261	92.4	7.6	
Father's education level				<.0001
Junior high or below	2500	77.4	22.6	
Senior high	7454	85.0	15.0	
Junior college	4134	92.1	7.9	
College and above	4623	96.7	3.3	
Mother's education level				<.0001
Junior high or below	2637	78.7	21.2	
Senior high	7526	85.6	14.4	
Junior college	4797	92.2	7.8	
College and above	3852	95.8	4.2	
Parents' employment status				
Father employed	18053	88.7	11.3	<.0001
Father not employed	610	82.5	17.5	
Mother employed	11475	90.1	9.9	<.0001
Mother not employed	7262	85.9	14.1	
Parents' smoking status				<.0001
Only father smokes	8854	83.6	16.4	
Only mother smokes	87	86.2	13.8	
Both parents smoke	923	69.1	30.9	
None of them smoke	8760	95.5	4.5	
Heavy smoker				
Father	4506	74.4	25.6	<.0001
Mother	162	49.4	50.6	<.0001
Children's characteristics				
Gender				
Boy	9912	88.1	11.9	0.189
Girl	8932	88.7	11.3	
Birth order				
First-born child	9468	89.7	10.3	<.0001
Non-first-born child	9365	87.1	12.9	
Child ever diagnosed with asthma				
Yes	586	86.5	13.5	0.145
No	18256	88.5	11.5	
Household characteristics				
Family income				<.0001
<30,000	2195	81.1	18.9	
30,000-100,000	14332	88.6	11.4	
>100,000	2249	94.8	5.2	
Any smoker present in the household				<.0001
No	7130	97.7	2.3	
Yes	11651	82.7	17.3	
Number of smokers in the family				<.0001
0	7790	95.9	4.1	
1	7309	88.4	11.6	
2	2513	76.7	23.3	
>=3	1209	64.4	35.6	

Table 3 Odds of heavy SHS exposure for children in all, smoker, and non-smoker households

	All households	Smoker households	Non-smoker households
Characteristics			
Total			
Parent's characteristics			
Father's age (Ref: <25)			
25-29	0.82 (0.63-1.08)	0.81 (0.62-1.06)	1.54 (0.19-12.46)
30-34	0.86 (0.66-1.13)	0.85 (0.65-1.12)	1.46 (0.18-11.89)
>=35	0.87 (0.66-1.14)	0.88 (0.67-1.16)	1.24 (0.15-10.16)
Mother's age (Ref: <25)			
25-29	0.96 (0.84-1.11)	0.98 (0.85-1.13)	0.99 (0.46-2.14)
30-34	0.84 (0.71-0.99)*	0.84 (0.71-1.00)*	0.93 (0.41-2.08)
>=35	0.75 (0.61-0.91)**	0.74 (0.60-0.92)**	0.97 (0.40-2.32)
Father's education level (Ref: <=Junior high)			
Senior high	0.77 (0.67-0.87)***	0.75 (0.66-0.85)***	2.04 (0.84-4.89)
Junior college	0.58 (0.48-0.69)***	0.56 (0.47-0.68)***	1.35 (0.54-3.42)
College and above	0.37 (0.29-0.47)***	0.33 (0.25-0.43)***	1.09 (0.42-2.86)
Mother's education level (Ref: <=Junior high)			
Senior high	0.80 (0.70-0.92)***	0.80 (0.69-0.92)**	1.02 (0.48-2.14)
Junior college	0.72 (0.58-0.83)***	0.67 (0.55-0.81)***	1.40 (0.64-3.06)
College and above	0.80 (0.60-0.98)	0.84 (0.65-1.10)	0.83 (0.35-1.98)
Parents' employment status			
Father employed (Ref: yes)	1.00 (0.78-1.30)	0.99 (0.76-1.29)	1.21 (0.42-3.48)
Mother employed (Ref: yes)	1.10 (0.99-1.21)	1.18 (1.06-1.32)**	0.46 (0.31-0.68)***
Parents' smoking status (Ref: None of them smoke)			
Only father smoke		0.87 (0.74-1.01)	
Only mother smoke		0.63 (0.32-1.22)	
Both parents smoke		1.62 (1.30-2.00)***	
Children's characteristics			
Child being a boy (Ref: Girl)	1.07 (0.96-1.17)	1.06 (0.96-1.18)	1.04 (0.76-1.43)
First-born child (Ref: no)	0.73 (0.67-0.82)***	0.74 (0.67-0.83)***	0.62 (0.44-0.87)**
Child ever diagnosed with asthma (Ref: no)	1.20 (0.94-1.60)	1.20 (0.91-1.59)	1.22 (0.53-2.81)
Household characteristics			
Family income (Ref: <30,000)			
30,000-100,000	0.96 (0.85-1.14)	0.98 (0.84-1.13)	0.88 (0.43-1.82)
>100,000	0.88 (0.71-1.17)	0.88 (0.67-1.16)	0.77 (0.32-1.82)
Any smoker present in the household (Ref: no)	3.78 (2.89-4.20)***		
Number of smokers in the family	1.45 (1.40-1.55)***	1.45 (1.38-1.53)***	

*p<0.05; **p<0.01;***p<0.001

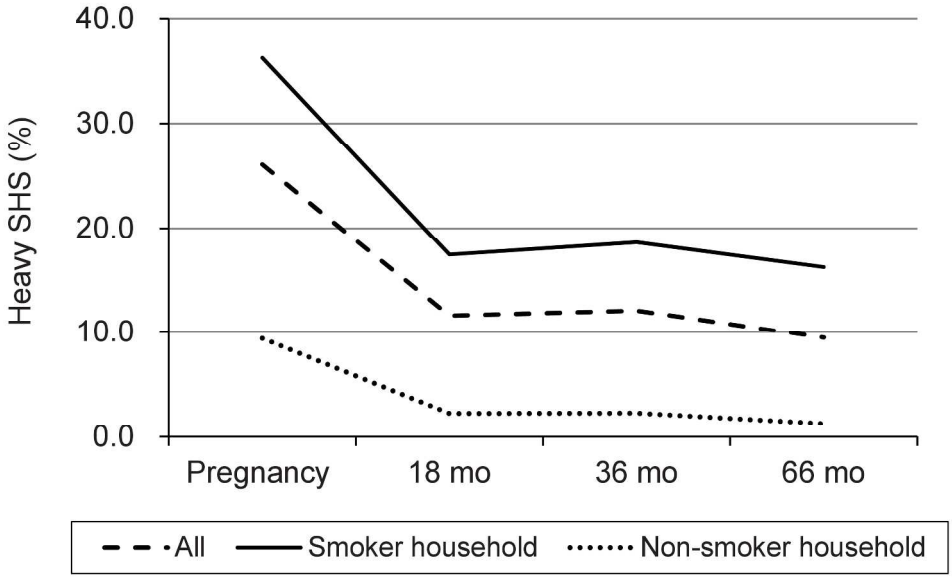

Figure 1. Prevalence of early childhood SHS exposure in-utero and afterbith in smoker and non-smoker households. The proportion of young children who were exposed to heavy SHS declined significantly after birth. The percentage of children exposed to heavy SHS is consistently higher for those living in smoker households than for those living in nonsmoker households.

244x160mm (300 x 300 DPI)

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5-6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	NA
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	18
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	NA

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	18-19
		(b) Indicate number of participants with missing data for each variable of interest	18-19
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	NA
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	NA
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	8-9
		Cross-sectional study—Report numbers of outcome events or summary measures	NA
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10
		(*b*) Report category boundaries when continuous variables were categorized	6
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12-13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	5
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	1

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Secondhand Smoke Exposure among 18-month Infants in Taiwan : a Population-Based Birth Cohort Study

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Secondhand Smoke Exposure among 18-month Infants in Taiwan: a Population-Based Birth Cohort Study

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Tables: 3
Figures: 1
Number of references: 32

ABSTRACT

Objectives: This study provides SHS exposure data in-utero and after birth when children were at 18 months, 36 months, and 66 months old, and it identifies risk factors for the early childhood SHS among 18-month-old infants living in smoker and non-smoker households.

Study design: The data come from the Taiwan Birth Cohort Study (TBCS), a longitudinal survey of a birth cohort born in 2005. This study used the survey wave when children were 18 months old (N = 18,845) for statistical analysis of early childhood SHS exposure. Logistic regression was used to identify the risk factors of the SHS exposure.

Results: Approximately 62% of the 18-month-old infants lived in a household with at least one smoker, with the father being the smoker in 84% of those households. Among these infants living in a smoker household, 70% were exposed to SHS and 36% were exposed to heavy SHS in utero, and the prevalence was approximately 66% and 17% after birth for SHS and heavy SHS, respectively. The number and the existence of smokers in the household, parents' smoking status, father's educational attainment, and being a first born baby are strong predictors of early childhood heavy SHS exposure.

Conclusions: Encouraging families to have a smoke-free home environment, empowering women to ensure their perspectives and rights are embedded into tobacco control efforts, and educating families about the health risks from childhood SHS exposure, especially among people living in households with smokers, will protect nonsmoking adults and children from SHS exposure.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- A unique dataset, which randomly selected newborns from all live births in 2005, tracks SHS exposure in utero and when the children were 18 months, 36 months, and 66 months old.
- Sample size is large, over 19,000 children for all waves.
- The response rate is high (>92%) for all waves.
- Parents or primary caregivers may underreport infant's SHS due to lack of awareness or social desirability bias.

INTRODUCTION

Secondhand smoke (SHS) puts nonsmoking adults and children at higher risk of premature death, illness, and other adverse effects. The health risk from SHS is especially substantial among children given that their lungs are still developing. Newborns exposed to SHS, either in utero or after birth, have higher risk of premature birth, low birth weight, and sudden infant death syndrome, and children exposed to SHS have higher risk of acute respiratory illness, middle ear infections, bronchi, reduced lung function, and asthma development.[1-3]

Globally it is estimated that over 40% of men smoke tobacco, whereas only approximately 10% of women smoke, and this gender discrepancy in tobacco smoking exists especially in middle and lower income countries.[4] Although worldwide smoking prevalence is low among women, women and children comprise the major population exposed to SHS with a global profile such that 35% of nonsmoking women and 40% of children were exposed to SHS in 2004.[5]

The home is a major setting for SHS exposure. Children, particularly children of preschool ages, are most likely to be exposed to SHS at home given that very young children spend most of their time in the home and smoking restrictions in the home are usually rare.[6] The existence of smoking household members serves as a strong predictor for SHS exposure among children.[7,8] Findings from the global Youth Tobacco Survey conducted by the World Health Organization (WHO) indicated that approximately 44% of youths worldwide are exposed to SHS at home, 47% of whom have at least 1 parent who smokes.[9]

Taiwan is similar to other developing countries in that men are the main subgroup of smokers, whereas the smoking rate for women is very low (40.0% for men, 4.8% for women in 2005, decreasing to 33.5% for men and 4.4% for women in 2011).[10] The prevalence of SHS exposure among nonsmoking women and children is substantial given the high male smoking rate and the limited of restrictions of smoking in homes

and some public places; consequently, the risk of adverse health associated with SHS for women and children who live with smokers is particularly high.[11-14] Previous studies using cross-sectional survey data in Taiwan indicated that over 60% of smoking parents with school-aged children smoke in the presence of their children,[12] and approximately 45% of junior and senior high school students have been exposed to SHS at home.[10]

However, few studies have investigated SHS exposure among children under 5 years old, the subgroup with developing lung systems that are most susceptible to SHS who spend most of their time at home and who are more likely to be exposed to SHS through their smoking household members than are older children.

This study uses birth cohort data, a longitudinal survey of a birth cohort born in 2005 and provides the prevalence of SHS exposure in-utero and after birth for infants and young children at 18 months, 36 months, and 66 months old. This study identifies risk factors of heavy SHS exposure among18-month infants, aiming to explore potential socio-demographic disparities associated with the early childhood SHS exposure.

METHODS

Data

Data come from the Taiwan Birth Cohort Study (TBCS), a longitudinal survey of a birth cohort born in 2005 in Taiwan. TBCS used a two-stage stratified random sampling design and drew the study sample from the population-based birth database (National Birth Report Database) with an 11.7% sampling rate, resulting in a nationally representative cohort of 24,200 newborn individuals born in 2005. Among those eligible newborns, 21,248 infants completed a baseline survey at 6 months of age with a response rate of 87.8%. These infants were subsequently recruited as cohort members. Three waves of follow-up surveys

were conducted when the infants and young children were at 18 months, 36 months, and 66 months of age, with response rates of 94.9%, 93.7%, and 92.8%, respectively.

The surveys were conducted via face-to-face interviews with either the mother or a primary caregiver providing the information. According to the 18-month survey, 98% of the respondents are mothers, 1.23% are primary caregivers, and 0.76% are both mothers and primary caregivers. Among the primary caregivers, the majority of them (90%) are fathers or grandparents. The surveys were reviewed and approved by the Directorate-General of Budget, Accounting, and Statistics, Executive Yuan, Republic of China. This study was approved by the Institutional Review Board at National Taiwan University Hospital.

This study uses 4 waves of the TBCS, when the infants and young children were 6 months, 18 months, 36 months, and 66 months old, to provide a time trend of SHS exposure across 4 time periods (in utero, 18 months, 36 months, and 66 months).

The 6 month wave provided retrospective information regarding women's SHS exposure during their pregnancy. The 18-, 36-, and 66-month waves provided information regarding young children's current SHS exposure. However, the 6-month wave did not provide information on children's current SHS exposure. The sample sizes are 21,248, 20,172, 19,910, and 19,721 for the 6-month, 18-month, 36-month, and 66-month waves, respectively.

This study restricts the study sample to the respondents who consistently answered 6-month, 18-month, 36-month, and 66-month survey waves, and that leads in the sample size equaling 18,845. Furthermore, this study uses the 18-month wave, the first wave of the TBCS, including children's current SHS information conducted between 2006 and 2007 for bivariate and multivariate analyses of early childhood SHS exposure.

The *in-utero SHS* is retrospectively reported in the 6 month wave and coded as "1" if the mother answered "1-2 days per week", "3-5 days per week", or "almost every day" to the question “During your pregnancy, did anyone smoke anywhere in front of you?” and "0" if the mother answered "never". The *in-utero heavy SHS* is coded as “1” if the mother answered either “almost every day” or “3-5 days per week” to that question and “0” if the mother answered “1-2 days per week”, “less than 1 day per week”, or “never”. The *childhood SHS* is measured separately in the 18-, 36-, and 66- month waves and coded as "1" if the mother or primary care giver answered "occasionally", "often", or "every day" to the question “How often is your baby exposed to secondhand smoke?” and "0" if the mother answered "never". The *heavy childhood SHS* is coded as “1” either “every day” or “often” to that question and “0” either “never” or "occasionally".

Parent’s smoking status was “1” if one answered “yes” to the question “did you smoke during the past month?”, and “0” otherwise. If a smoker smoked over 20 cigarettes a day, she or he was defined as a heavy smoker, otherwise not a heavy smoker. The respondents were asked “has the baby ever been diagnosed with asthma by a doctor?”, and which was used to describe children’s health condition related to SHS exposure. Smoker household was coded 1 if any parent or other household members smoked and 0 if none of them smoked.

All control variables of the statistical analysis, including characteristics of the parents, children, and household, were measured when the child was 18 months except for the parents’ age at birth of child (answered at 6 months) and asthma in the child (measured at 36 months).

Statistical methods

Descriptive Analysis

The sample was classified into two groups: young children living in a smoker household and those living in a non-smoker household. The crude proportion of the in-utero and heavy childhood SHS exposure at 18 months, 36 months, and 66 months old was provided for all children, those in smoker and nonsmoker households alike.

Summary statistics for outcome (heavy early childhood SHS exposure) and covariates (parents' characteristics, child's characteristics, and household characteristics) are provided for the 18-month infants in both smoker and nonsmoker households.

Bivariate associations of each covariate with heavy and non-heavy early childhood SHS exposure were tested with Chi-square tests for categorical variables and ANOVA for continuous variables.

Statistical Analysis

This study used logistic regression to estimate the odds of heavy early childhood SHS exposure for two groups (infants living in a smoker household and infants living in a nonsmoker household), separately. This approach identifies the risk factors associated with heavy early childhood SHS exposure, and it captures potential differences in the associations between heavy early childhood SHS exposure and covariates among infants living in smoker and nonsmoker households.

All statistical analyses were conducted by SAS version 9.3.

RESULTS

Trends of childhood SHS exposure

In general, the proportion of young children who were exposed to heavy SHS was 26.1% in utero, and it declined significantly after birth to 11.6%, 12.1%, and 9.5% when the children were 18 months, 36 months, and 66 months old, respectively (Figure 1).

When the sample was divided into those who live in smoker versus nonsmoker households, the trend presents similar patterns between the two subsamples (the heavy SHS prevalence declined significantly after birth). The percentage of young children exposed to heavy SHS is consistently high for those living in smoker households.

[INSERT FIGURE 1]

Baseline summary statistics

Among the18-month infants, 61.8% lived in a smoker household and 37.8% lived in a nonsmoker household. The average age was 36.5 years for fathers and 29.9 years for mothers. Educational attainment was higher for parents living in nonsmoker households than for those living in smoker households. Approximately half of the infants (47%) had the father as the only smoker in the household, 0.5% had the mother as the only smoker, 4.9% had both parents as smokers, and 46.5% had neither parent as a smoker. Similarly, among infants living in smoker households, 76% had the father as the only smoker, 7.9% had the mother as the only smoker, and 14% had other family member as the only smoker. On average, smoking fathers smoked approximately 15 cigarettes per day, and smoking mothers smoked approximately 9 cigarettes per day (Table 1).

[INSERT TABLE 1]

Among the 18- month infants, 52% were boys and 50% were first born children. On average, 55.2% of the 18-month infants were exposed to SHS, with 66% exposed to SHS in a smoker household and 37.7% exposed to SHS in a non-smoker household. A total of 11.6% of the infants were exposed to heavy SHS, with 17.3% exposed to heavy SHS from living in a smoker household and 2.3% exposed from living in a nonsmoker household. Among the 18- month infants, 3.1% were diagnosed with asthma. On average, family income for infants living in nonsmoker households (<30000: 6.3%, 30,000-100,000: 74.6%, >100,000: 18.9) was higher than that for smoker households (<30,000:14.6%, 30,000-100,000:77.2%, >100,000: 7.7%). The average number of smokers living in a smoker household with infants was 1.4.

Bivariate analysis

Results from bivariate analyses (Table 2) indicate that presence of heavy SHS is significantly associated with parents' younger age, lower education level, not employed, currently smoking, and higher smoking intensity (all $p < 0.01$). Heavy SHS was significantly higher among non-first-born children than first born children ($p<0.01$).

[INSERT TABLE 2]

Household characteristics such as family income, smoking status, and number of smokers in the household were found to be significantly associated with heavy SHS exposure (all $p<0.01$).

Multivariate analysis

The results from multivariate logistic regression (Table 3) indicate that among all of the 18-month infants, the presence of a smoker in the household increased the likelihood for them to be exposed to heavy SHS. The more smokers present in the household, the more likely they are to be exposed to heavy SHS. The older the mother is, the less likely child is to be exposed to heavy SHS. The higher the father and

mother's educational status is, the less likely the child is to be exposed to heavy SHS. Being a first born child is associated with decreased likelihood of heavy SHS exposure.

[INSERT TABLE 3]

After dividing the infants into those living in smoker versus nonsmoker households, parental characteristics such as age of mother and education of father and mother are significantly associated with the heavy early childhood SHS exposure for those living in smoker households but not among those living in nonsmoker households. Among infants living in a smoker household, the subgroup of infants having both smoker parents have significant higher likelihood to be exposed to heavy SHS compared to their counterparts. The mother's employment status was found to be significantly associated with increased SHS exposure for infants in a smoker household but decreased SHS exposure for infants in nonsmoker households. Being a first born child was found to be associated with decreased likelihood of SHS exposure for infants living in either a nonsmoker or smoker household.

DISCUSSION

To our knowledge, this is the first study using a birth cohort data and investigating SHS exposure in utero and among young children at different ages under 5 years old. This study uses a unique dataset, the Taiwan Birth Cohort Survey (TBCS) data, which randomly selected newborns from among all live births in 2005, and tracks SHS exposure in utero and when the children were 18 months, 36 months, and 66 months old.

Our results indicate that among the 18-month-old infants, 61.8% of them lived in a household with at least one smoker, with the father being the smoker in 84% of those households. This result confirms previous studies in East Asia indicating that most childhood SHS may come from the father and other

household members, whereas 76% of infants living in a smoker household have father being the only smoker, and 14% have other family member and 0.7% have mother being the only smoker [7,15] These results indicate the urgent need to keep homes smoke-free to protect children from SHS exposure. Indeed, banning smoking in the home is found to be associated with a significant reduction in urinary cotinine to creatinine ratio in infants.[16-19] However, smoking restrictions in homes are not mandated by legal regulations, and the voluntary restriction of smoking is usually rare. Efforts are needed to encourage Taiwanese families to adopt their own policy of restricting smoking in the home setting.

Taiwan is similar to many other Asian countries in that the familial values are deeply influenced by Confucianism, with an expectation of respecting the elderly and males to maintain the patriarchal family. This philosophy of Confucianism and patriarchy embedded in Chinese familial values may cause married women and children to be hesitant to change the smoking behavior of their male household members or to ask male smokers to smoke outside of the home.[20,21] Therefore, in addition to encouraging families to have a smoke-free home environment, there is a crucial need to empower women to ensure that their perspectives and rights are embedded in tobacco control efforts to protect not only themselves but also their children from SHS exposure.

Previous studies have indicated that smoke-free legislation in public places can spill over to the home setting through creating a norm of not smoking around nonsmokers.[22-25] Indeed, a few studies found that the comprehensive smoke-free laws enacted in 2009 in Taiwan reduced adult nonsmokers' SHS exposure in the home and even increased smoking cessation.[11,14] The enforcement of smoke-free environments in many public places may further reduce women and children's SHS exposure at home. In our study, we found that the SHS exposure declined significantly from 12.1% when the children were 36

month olds in 2008 to 9.5% when the children were 66 month olds in 2010-2011. The decreasing patterns were similar when the sample was divided into those who live in smoker versus nonsmoker households. Part of the decrease may result from the implementation of comprehensive smoke-free laws in 2009.

Our results indicated that the firstborn children are significantly less likely to be exposed to heavy SHS than later borns are. This finding confirms previous studies indicating that firstborn children tend to receive higher quality care in social, affectionate, and caretaking activities during early childhood than later borns do.[26-28] In addition, the finding of the high in-utero SHS exposure indicates a serious lack of knowledge on and social protection from the harms of SHS exposure during pregnancy, leading pregnant women continually being exposed to SHS.[29-31]

Our results indicated that several factors are significantly associated with heavy early childhood SHS exposure, which allows the specific groups to be targeted by interventions to be identified, for example households with smokers, households with more than one smoker, both parents smoke, parents with lower educational attainment, mothers of younger age, and non-first-born children. More educational interventions and resources need to be aimed at these target groups to reduce early childhood SHS exposure from their household smokers through education about the health risks from SHS exposure.

A potential limitation this study has is that parents or primary caregivers may underreport infant's SHS due to lack of awareness or social desirability bias. Nevertheless, in our sample, 55.2% of primary caregivers indicated that their children were exposed to SHS, and this prevalence is higher than previously found in Taiwan.[10,13] Another concern regarding systematic bias in childhood SHS exposure may arise if underreporting occurs in a certain demographic or socioeconomic subgroup and not others. However, a

study using multiple SHS exposure measures, both self-reporting and serum cotinine level, indicated that exposure patterns by demographic characteristics were similar among those two measures.[32]

CONCLUSIONS

This study investigated the early childhood SHS exposure among 18-month-old infants, a subgroup of young children spending most of their time at home and most likely to be exposed to household SHS through their household members. The results indicate that most early childhood SHS comes from the father and other household members, whereas the smoking rate for women in this study setting is very low. Encouraging families to maintain a smoke-free home environment, empowering women to ensure their perspectives and rights are embedded into tobacco control efforts, and educating families about the health risks from childhood SHS exposure, especially among children living in households with smokers, will protect nonsmoking women and their children from SHS exposure.

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Contributors' Statement:

Kai-Wen Cheng: Dr. Cheng conceived the topic, designed the statistical plans, and drafted the article.

Wan-Lin Chiang: Ms. Chiang did the actual statistical run and conducted the editing during the manuscript preparation.

Tung-liang Chiang: Dr. Chiang initiated the collaborative project, provided critical comments, and revised the draft article.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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Conflicts of Interest: The authors declare that they have no conflict of interest.

Data Sharing Statement: No additional data available.

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Figure 1. Prevalence of early childhood SHS exposure in-utero and afterbith in smoker and non-smoker households. The proportion of young children who were exposed to heavy SHS declined significantly after birth. The percentage of children exposed to heavy SHS is consistently higher for those living in smoker households than for those living in nonsmoker households.

Table 1 Baseline summary descriptive data (measured when the children were 18 months old), N(% and mean±SD)

Variables	Number of Observations	All households	Nonsmoker households	Smoker households
Total	18845	(100.0)	7130 (100.0)	11651 (100.0)
Parent's characteristics				
Father's age (years)	18845	(36.5±13.8)	7130 (35.7±9.1)	11651 (36.9±15.6)
<25	475	(2.5)	53 (0.7)	419 (3.6)
25-29	3440	(18.3)	858 (12.0)	2574 (22.1)
30-34	6592	(35.0)	2729 (38.3)	3859 (33.1)
>=35	8338	(44.2)	3490 (49.0)	4799 (41.2)
Mother's age (years)	18845	(29.9±4.8)	7130 31.4±4.3)	11651 (28.9±4.9)
<25	2707	(14.4)	409 (5.7)	2283 (19.6)
25-29	6117	(32.4)	1848 (25.9)	4251 (36.5)
30-34	6760	(35.9)	3236 (45.4)	3510 (30.1)
>=35	3261	(17.3)	1637 (23.0)	1607 (13.8)
Father's education level				
Junior high or below	2500	(13.3)	409 (5.7)	2079 (17.8)
Senior high	7454	(39.6)	1772 (24.9)	5664 (48.6)
Junior college	4134	(21.9)	1790 (25.1)	2332 (20.0)
College and above	4623	(24.5)	3140 (44.0)	1479 (12.7)
Missing	134	(0.7)	19 (0.3)	97 (0.8)
Mother's education level				
Junior high or below	2637	(14.0)	521 (7.3)	2103 (18.1)
Senior high	7526	(39.9)	1927 (27.0)	5571 (47.8)
Junior college	4797	(25.5)	2147 (30.1)	2638 (22.6)
College and above	3852	(20.4)	2527 (35.5)	1314 (11.3)
Missing	33	(0.2)	8 (0.1)	25 (0.2)
Parents' employment status				
Father employed	18053	(95.8)	6969 (97.7)	11075 (95.1)
Missing	182	(1.0)	9 (0.1)	121 (0.6)
Mother employed	11475	(60.9)	4698 (65.9)	6733 (57.8)
Missing	108	(0.6)	9 (0.1)	92 (0.5)
Parents' smoking status				
Only father smokes	8854	(47.0)	0 (0.0)	8854 (76.0)
Only mother smokes	87	(0.4)	0 (0.0)	87 (0.7)
Both parents smoke	923	(4.9)	0 (0.0)	923 (7.9)
None of them smoke	8760	(46.5)	7130 (100.0)	1630 (14.0)
Missing	221	(1.2)	0 (0.0)	157 (1.4)
Parents' smoking intensity (smokers)				
Father's cigarettes per day	9782	(15.2±9.5)	0 -	9782 (15.2±9.4)
Mother's cigarettes per day	1052	(9.3±6.8)	0 -	1052 (9.3±6.8)
Children's characteristics				
Child being a boy	9912	(52.6)	3765 (52.8)	6114 (52.5)
First-born child				
Yes	9468	(50.2)	3579 (50.2)	5845 (50.2)
No	9367	(49.7)	3551 (49.8)	5796 (49.7)
Missing	10	(0.1)	0 (0.0)	10 (0.1)
Children's SHS exposure				
General SHS exposure				
Never	8441	(44.8)	4439 (62.3)	3961 (34.0)
Ever	10401	(55.2)	2691 (37.7)	7690 (66.0)
Missing	3	(0.0)	0 (0.0)	0 (0.0)
SHS intensity				
Non-heavy SHS exposure	16659	(88.4)	6968 (97.7)	9632 (82.7)
Heavy SHS exposure	2183	(11.6)	162 (2.3)	2019 (17.3)
Missing	3	(0.0)	0 (0.0)	0 (0.0)
Child ever diagnosed with asthma	586	(3.1)	228 (3.2)	354 (3.0)
Household characteristics				
Family income (NTD)				
<30,000	2195	(11.6)	449 (6.3)	1705 (14.6)
30,000-100,000	14332	(76.1)	5319 (74.6)	8996 (77.2)
>100,000	2249	(11.9)	1348 (18.9)	900 (7.7)
Missing	69	(0.4)	14 (0.2)	50 (0.4)
Number of smokers in the family	18821	(0.9±1.0)	7130 (0.0±0.0)	11628 (1.4±0.9)

*NTD, New Taiwan Dollars, 30 NTD≒1 USD; 40 NTD≒1 GBP

Table 2 Early childhood SHS exposure by household, parental, and children's characteristics, N(%)

Characteristics	Total (n)	Non-heavy SHS	Heavy SHS	p-value
Total	18845	16659 (88.4)	2183 (11.6)	
Parent's characteristics				
Father's age (years)				<.0001
<25	475	373 (78.5)	102 (21.5)	
25-29	3440	2939 (85.4)	501 (14.6)	
30-34	6592	5909 (89.6)	683 (10.4)	
>=35	8338	7438 (89.2)	897 (10.8)	
Mother's age (years)				<.0001
<25	2707	2171 (80.2)	535 (19.8)	
25-29	6117	5281 (86.3)	835 (13.7)	
30-34	6760	6195 (91.6)	564 (8.3)	
>=35	3261	3012 (92.4)	249 (7.6)	
Father's education level				<.0001
Junior high or below	2500	1934 (77.4)	564 (22.6)	
Senior high	7454	6337 (85.0)	1117 (15.0)	
Junior college	4134	3808 (92.1)	325 (7.9)	
College and above	4623	4469 (96.7)	154 (3.3)	
Mother's education level				<.0001
Junior high or below	2637	2076 (78.7)	559 (21.2)	
Senior high	7526	6442 (85.6)	1083 (14.4)	
Junior college	4797	4422 (92.2)	375 (7.8)	
College and above	3852	3689 (95.8)	163 (4.2)	
Parents' employment status				
Father employed	18053	16007 (88.7)	2045 (11.3)	<.0001
Father not employed	610	503 (82.5)	107 (17.5)	
Mother employed	11475	10337 (90.1)	1137 (9.9)	<.0001
Mother not employed	7262	6240 (85.9)	1022 (14.1)	
Parents' smoking status				<.0001
Only father smokes	8854	7404 (83.6)	1450 (16.4)	
Only mother smokes	87	75 (86.2)	12 (13.8)	
Both parents smoke	923	638 (69.1)	285 (30.9)	
None of them smoke	8760	8364 (95.5)	396 (4.5)	
Heavy smoker				
Father	4506	3351 (74.4)	1155 (25.6)	<.0001
Mother	162	80 (49.4)	82 (50.6)	<.0001
Children's characteristics				
Gender				
Boy	9912	8733 (88.1)	1177 (11.9)	0.189
Girl	8932	7926 (88.7)	1006 11.3)	
Birth order				
First-born child	9468	8491 (89.7)	976 (10.3)	<.0001
Non-first-born child	9365	8158 (87.1)	1207 (12.9)	
Child ever diagnosed with asthma				
Yes	586	507 (86.5)	79 (13.5)	0.145
No	18256	16152 (88.5)	2104 (11.5)	
Household characteristics				
Family income (NTD)				<.0001
<30,000	2195	1781 (81.1)	414 (18.9)	
30,000-100,000	14332	12694 (88.6)	1637 (11.4)	
>100,000	2249	2132 (94.8)	117 (5.2)	
Any smoker present in the household				<.0001
No	7130	6968 (97.7)	162 (2.3)	
Yes	11651	9632 (82.7)	2019 (17.3)	
Number of smokers in the family				<.0001
0	7790	7472 (95.9)	316 (4.1)	
1	7309	6463 (88.4)	846 (11.6)	
2	2513	1927 (76.7)	586 (23.3)	
>=3	1209	778 (64.4)	431 (35.6)	

*NTD, New Taiwan Dollars, 30 NTD≒1 USD; 40 NTD≒1 GBP

Table 3 Risk factors for heavy SHS exposure for children in all, smoker, and non-smoker households

	All households	Smoker households	Non-smoker households
Characteristics			
Total			
Parent's characteristics			
Father's age (years) (Ref: <25)			
25-29	0.82 (0.63-1.08)	0.81 (0.62-1.06)	1.54 (0.19-12.46)
30-34	0.86 (0.66-1.13)	0.85 (0.65-1.12)	1.46 (0.18-11.89)
>=35	0.87 (0.66-1.14)	0.88 (0.67-1.16)	1.24 (0.15-10.16)
Mother's age (years) (Ref: <25)			
25-29	0.96 (0.84-1.11)	0.98 (0.85-1.13)	0.99 (0.46-2.14)
30-34	0.84 (0.71-0.99)*	0.84 (0.71-1.00)*	0.93 (0.41-2.08)
>=35	0.75 (0.61-0.91)**	0.74 (0.60-0.92)**	0.97 (0.40-2.32)
Father's education level (Ref: <=Junior high)			
Senior high	0.77 (0.67-0.87)***	0.75 (0.66-0.85)***	2.04 (0.84-4.89)
Junior college	0.58 (0.48-0.69)***	0.56 (0.47-0.68)***	1.35 (0.54-3.42)
College and above	0.37 (0.29-0.47)***	0.33 (0.25-0.43)***	1.09 (0.42-2.86)
Mother's education level (Ref: <=Junior high)			
Senior high	0.80 (0.70-0.92)***	0.80 (0.69-0.92)**	1.02 (0.48-2.14)
Junior college	0.72 (0.58-0.83)***	0.67 (0.55-0.81)***	1.40 (0.64-3.06)
College and above	0.80 (0.60-0.98)	0.84 (0.65-1.10)	0.83 (0.35-1.98)
Parents' employment status			
Father employed (Ref: yes)	1.00 (0.78-1.30)	0.99 (0.76-1.29)	1.21 (0.42-3.48)
Mother employed (Ref: yes)	1.10 (0.99-1.21)	1.18 (1.06-1.32)**	0.46 (0.31-0.68)***
Parents' smoking status (Ref: None of them smoke)			
Only father smoke		0.87 (0.74-1.01)	
Only mother smoke		0.63 (0.32-1.22)	
Both parents smoke		1.62 (1.30-2.00)***	
Children's characteristics			
Child being a boy (Ref: Girl)	1.07 (0.96-1.17)	1.06 (0.96-1.18)	1.04 (0.76-1.43)
First-born child (Ref: no)	0.73 (0.67-0.82)***	0.74 (0.67-0.83)***	0.62 (0.44-0.87)**
Child ever diagnosed with asthma (Ref: no)	1.20 (0.94-1.60)	1.20 (0.91-1.59)	1.22 (0.53-2.81)
Household characteristics			
Family income (NTD) (Ref: <30,000)			
30,000-100,000	0.96 (0.85-1.14)	0.98 (0.84-1.13)	0.88 (0.43-1.82)
>100,000	0.88 (0.71-1.17)	0.88 (0.67-1.16)	0.77 (0.32-1.82)
Any smoker present in the household (Ref: no)	3.78 (2.89-4.20)***		
Number of smokers in the family	1.45 (1.40-1.55)***	1.45 (1.38-1.53)***	

*p<0.05; **p<0.01;***p<0.001

NTD, New Taiwan Dollars, 30 NTD≒1 USD; 40 NTD≒1 GBP

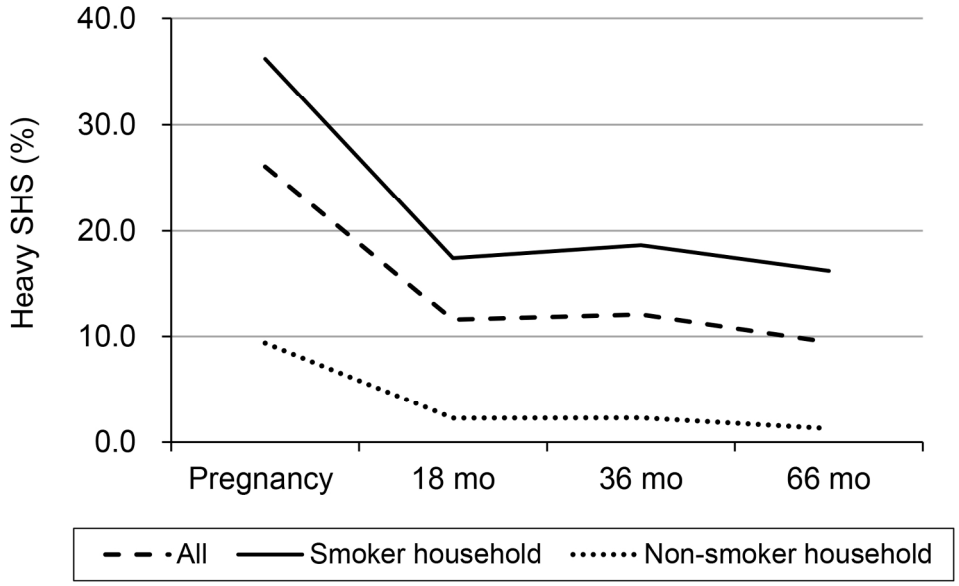

Figure 1. Prevalence of early childhood SHS exposure in-utero and afterbith in smoker and non-smoker households. The proportion of young children who were exposed to heavy SHS declined significantly after birth. The percentage of children exposed to heavy SHS is consistently higher for those living in smoker households than for those living in nonsmoker households.

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5-6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	NA
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	18
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	NA

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Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	18-19
		(b) Indicate number of participants with missing data for each variable of interest	18-19
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	NA
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	NA
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	8-9
		Cross-sectional study—Report numbers of outcome events or summary measures	NA
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10
		(*b*) Report category boundaries when continuous variables were categorized	6
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12-13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	5
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	1

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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		(*e*) Describe any sensitivity analyses	NA

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	21-22
		(b) Indicate number of participants with missing data for each variable of interest	21-22
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	NA
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	NA
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	9-10
		Cross-sectional study—Report numbers of outcome events or summary measures	NA
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	23
		(*b*) Report category boundaries when continuous variables were categorized	6-7
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	5
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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In-utero and early childhood exposure to secondhand smoke in Taiwan: A population-based birth cohort study

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ABSTRACT

Objectives: This study provides SHS exposure data in-utero and after birth when children were at 18 months, 36 months, and 66 months old, and it identifies risk factors for the early childhood SHS among 18-month-old infants living in smoker and non-smoker households.

Study design: The data come from the Taiwan Birth Cohort Study (TBCS), a longitudinal survey of a birth cohort born in 2005. This study used the survey wave when children were 18 months old (N = 18,845) for statistical analysis of early childhood SHS exposure. Logistic regression was used to identify the risk factors of the SHS exposure.

Results: Approximately 62% of the 18-month-old infants lived in a household with at least one smoker, with the father being the smoker in 84% of those households. Among these infants living in a smoker household, 70% were exposed to SHS and 36% were exposed to heavy SHS in utero, and the prevalence was approximately 66% and 17% after birth for SHS and heavy SHS, respectively. The number and the existence of smokers in the household, parents' smoking status, father's educational attainment, and being a first born baby are strong predictors of early childhood heavy SHS exposure.

Conclusions: Encouraging families to have a smoke-free home environment, empowering women to ensure their perspectives and rights are embedded into tobacco control efforts, and educating families about the health risks from childhood SHS exposure, especially among people living in households with smokers, will protect nonsmoking adults and children from SHS exposure.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- A unique dataset, which randomly selected newborns from all live births in 2005, tracks SHS exposure in utero and when the children were 18 months, 36 months, and 66 months old.
- Sample size is large, over 19,000 children for all waves.
- The response rate is high (>92%) for all waves.
- Parents or primary caregivers may underreport infant's SHS due to lack of awareness or social desirability bias.

INTRODUCTION

Secondhand smoke (SHS) puts nonsmoking adults and children at higher risk of premature death, illness, and other adverse effects. The health risk from SHS is especially substantial among children given that their lungs are still developing. Newborns exposed to SHS, either in utero or after birth, have higher risk of premature birth, low birth weight, and sudden infant death syndrome, and children exposed to SHS have higher risk of acute respiratory illness, middle ear infections, bronchi, reduced lung function, and asthma development.[1-3]

Globally it is estimated that over 40% of men smoke tobacco, whereas only approximately 10% of women smoke, and this gender discrepancy in tobacco smoking exists especially in middle and lower income countries.[4] Although worldwide smoking prevalence is low among women, women and children comprise the major population exposed to SHS with a global profile such that 35% of nonsmoking women and 40% of children were exposed to SHS in 2004.[5]

The home is a major setting for SHS exposure. Children, particularly children of preschool ages, are most likely to be exposed to SHS at home given that very young children spend most of their time in the home and smoking restrictions in the home are usually rare.[6] The existence of smoking household members serves as a strong predictor for SHS exposure among children.[7,8] Findings from the global Youth Tobacco Survey conducted by the World Health Organization (WHO) indicated that approximately 44% of youths worldwide are exposed to SHS at home, 47% of whom have at least 1 parent who smokes.[9]

Taiwan is similar to other developing countries in that men are the main subgroup of smokers, whereas the smoking rate for women is very low (40.0% for men, 4.8% for women in 2005, decreasing to 33.5% for

men and 4.4% for women in 2011).[10] The prevalence of SHS exposure among nonsmoking women and children is substantial given the high male smoking rate and the limited restrictions of smoking in homes and some public places; consequently, the risk of adverse health associated with SHS for women and children who live with smokers is particularly high.[11-14] Previous studies using cross-sectional survey data in Taiwan indicated that over 60% of smoking parents with school-aged children smoke in the presence of their children,[12] and approximately 45% of junior and senior high school students have been exposed to SHS at home.[10]

However, few studies have investigated SHS exposure among children under 5 years old, the subgroup with developing lung systems that are most susceptible to SHS. These young children spend most of their time at home and are more likely to be exposed to SHS through their smoking household members than are older children.

This study uses birth cohort data, a longitudinal survey of a birth cohort born in 2005 and provides the prevalence of SHS exposure in-utero and children at 18 months, 36 months, and 66 months old. This study identifies risk factors of heavy SHS exposure among18-month infants, aiming to explore potential socio-demographic disparities associated with the early childhood SHS exposure.

METHODS

Data

Data come from the Taiwan Birth Cohort Study (TBCS), a longitudinal survey of a nationally representative birth cohort born in 2005 in Taiwan. The TBCS used a two-stage stratified random sampling design and drew the study sample from the population-based birth database (National Birth Report Database) with an 11.7% sampling rate, resulting in a nationally representative cohort of 24,200 newborn

individuals born in 2005. Among those eligible newborns, 21,248 infants completed a baseline survey at 6 months of age with a response rate of 87.8%. These infants were subsequently recruited as cohort members. Three waves of follow-up surveys were conducted when the infants and young children were at 18 months, 36 months, and 66 months of age, with response rates of 94.9%, 93.7%, and 92.8%, respectively. The TBCS is sponsored by Taiwan Health Promotion Administration designed to document the health and developmental trajectories of children in Taiwan, and the survey has been widely used in studies investigating topics in child development and health [15-17]. Detailed information about the TBCS can be found in previous publications.[18-20]

The survey was conducted via face-to-face interviews using standardized questionnaires with either the mother or a primary caregiver by trained interviewers, providing the information about children's health and development, child care, lifestyle, and social and physical environment exposures. According to the 18-month survey, 98% of the respondents are mothers, 1.23% are primary caregivers, and 0.76% are both mothers and primary caregivers. Among the primary caregivers, the majority of them (90%) are fathers or grandparents. The TBCS survey protocol and questionnaires have been reviewed and approved by the IRB of the Bureau of Health Promotion, Department of Health and the Directorate-General of Budget, Accounting, and Statistics, Executive Yuan, Republic of China (No. 94-C3-0940005257). This study is approved by the Institutional Review Board at National Taiwan University Hospital (ID number: 201503081RINB). The survey, the wave when children were 18 months, is attached as a supplementary file.

This study uses 4 waves of the TBCS, when the infants and young children were 6 months, 18 months, 36 months, and 66 months old, to provide a time trend of SHS exposure across 4 time periods (in utero, 18 months, 36 months, and 66 months).

The 6 month wave provided retrospective information regarding women's SHS exposure during their pregnancy. The 18-, 36-, and 66-month waves provided information regarding young children's current SHS exposure. However, the 6-month wave did not provide information on children's current SHS exposure. The sample sizes are 21,248, 20,172, 19,910, and 19,721 for the 6-month, 18-month, 36-month, and 66-month waves, respectively.

This study restricts the study sample to the respondents who consistently answered 6-month, 18-month, 36-month, and 66-month survey waves, and that leads in the sample size equaling 18,845. Furthermore, this study uses the 18-month wave, the first wave of the TBCS, including children's current SHS information conducted between 2006 and 2007 for bivariate and multivariate analyses of early childhood SHS exposure.

The *in-utero SHS* is retrospectively reported in the 6 month wave and coded as "1" if the mother answered "1-2 days per week", "3-5 days per week", or "almost every day" to the question "During your pregnancy, did anyone smoke anywhere in front of you?" and "0" if the mother answered "never". The *in-utero heavy SHS* is coded as "1" if the mother answered either "almost every day" or "3-5 days per week" to that question and "0" if the mother answered "1-2 days per week", "less than 1 day per week", or "never". The *childhood SHS* is measured separately in the 18-, 36-, and 66- month waves and coded as "1" if the mother or primary care giver answered "occasionally", "often", or "every day" to the question "How often is your baby exposed to secondhand smoke?" and "0" if the mother answered "never". The *heavy*

childhood SHS is coded as "1" either "every day" or "often" to that question and "0" either "never" or "occasionally".

Parent's smoking status was "1" if one answered "yes" to the question "did you smoke during the past month?", and "0" otherwise. If a smoker smoked over 20 cigarettes a day, she or he was defined as a heavy smoker, otherwise not a heavy smoker. Smoker household was coded 1 if any parent or other household members smoked and 0 if none of them smoked.

All control variables of the statistical analysis, including characteristics of the parents, children, and household, were measured when the child was 18 months except for the parents' age at birth of child (answered at 6 months).

Statistical methods

Descriptive Analysis

The sample was classified into two groups: young children living in a smoker household and those living in a non-smoker household. The crude proportion of the in-utero and heavy childhood SHS exposure at 18 months, 36 months, and 66 months old was provided for all children, those in smoker and nonsmoker households alike.

Summary statistics for outcome (heavy early childhood SHS exposure) and covariates (parents' characteristics, child's characteristics, and household characteristics) are provided for the 18-month infants in both smoker and nonsmoker households.

Bivariate associations of each covariate with heavy and non-heavy early childhood SHS exposure were tested with Chi-square tests for categorical variables and ANOVA for continuous variables.

Statistical Analysis

This study used logistic regression to estimate the odds of heavy early childhood SHS exposure for two groups (infants living in a smoker household and infants living in a nonsmoker household), separately. This approach identifies the risk factors associated with heavy early childhood SHS exposure, and it captures potential differences in the associations between heavy early childhood SHS exposure and covariates among infants living in smoker and nonsmoker households.

All statistical analyses were conducted by SAS version 9.3.

RESULTS

Trends of childhood SHS exposure

In general, the proportion of young children who were exposed to heavy SHS was 26.1% in utero, and it declined significantly after birth to 11.6%, 12.1%, and 9.5% when the children were 18 months, 36 months, and 66 months old, respectively (Figure 1).

When the sample was divided into those who live in smoker versus nonsmoker households, the trend presents similar patterns between the two subsamples (the heavy SHS prevalence declined significantly after birth). The percentage of young children exposed to heavy SHS is consistently high for those living in smoker households.

[INSERT FIGURE 1]

Baseline summary statistics

Among the18-month infants, 61.8% lived in a smoker household and 37.8% lived in a nonsmoker household. The average age was 36.5 years for fathers and 29.9 years for mothers. Educational attainment was higher for parents living in nonsmoker households than for those living in smoker households. Approximately half of the infants (47%) had the father as the only smoker in the household, 0.5% had the mother as the only smoker, 4.9% had both parents as smokers, and 46.5% had neither parent as a smoker. Similarly, among infants living in smoker households, 76% had the father as the only smoker, 7.9% had the mother as the only smoker, and 14% had other family member as the only smoker. On average, smoking fathers smoked approximately 15 cigarettes per day, and smoking mothers smoked approximately 9 cigarettes per day (Table 1).

[INSERT TABLE 1]

Among the 18- month infants, 52% were boys and 50% were first born children. On average, 55.2% of the 18-month infants were exposed to SHS, with 66% exposed to SHS in a smoker household and 37.7% exposed to SHS in a non-smoker household. A total of 11.6% of the infants were exposed to heavy SHS, with 17.3% exposed to heavy SHS from living in a smoker household and 2.3% exposed from living in a nonsmoker household. On average, family income for infants living in nonsmoker households (<30000: 6.3%, 30,000-100,000: 74.6%, >100,000: 18.9) was higher than that for smoker households (<30,000:14.6%, 30,000-100,000:77.2%, >100,000: 7.7%). The average number of smokers living in a smoker household with infants was 1.4.

Bivariate analysis

Results from bivariate analyses (Table 2) indicate that presence of heavy SHS is significantly associated with parents' younger age, lower education level, not employed, currently smoking, and higher smoking intensity (all $p < 0.01$). Heavy SHS was significantly higher among non-first-born children than first born children ($p<0.01$).

[INSERT TABLE 2]

Household characteristics such as lower family income, smoking parents, and more smokers in the household were found to be significantly associated with heavy SHS exposure (all $p<0.01$).

Multivariate analysis

The results from multivariate logistic regression (Table 3) indicate that among all of the 18-month infants, the presence of a smoker in the household increased the likelihood for them to be exposed to heavy SHS. The more smokers present in the household, the more likely they are to be exposed to heavy SHS. The older the mother is, the less likely child is to be exposed to heavy SHS. The higher the father and

mother's educational status is, the less likely the child is to be exposed to heavy SHS. Being a first born child is associated with decreased likelihood of heavy SHS exposure.

[INSERT TABLE 3]

After dividing the infants into those living in smoker versus nonsmoker households, parental characteristics such as age of mother and education of father and mother are significantly associated with the heavy early childhood SHS exposure for those living in smoker households but not among those living in nonsmoker households. We found that among children living in smoker households, the older their mother is and the higher their father or mother's education is, the less likely the child is to be exposed to heavy SHS. Among infants living in a smoker household, the subgroup of infants having both smoker parents have significant higher likelihood to be exposed to heavy SHS compared to their counterparts. The mother's employment status was found to be significantly associated with increased SHS exposure for infants in a smoker household but decreased SHS exposure for infants in nonsmoker households. Being a first born child was found to be associated with decreased likelihood of SHS exposure for infants living in either a nonsmoker or smoker household.

DISCUSSION

To our knowledge, this is the first study using a birth cohort data and investigating SHS exposure in utero and among young children at different ages under 5 years old. This study uses a unique dataset, the Taiwan Birth Cohort Survey (TBCS) data, which randomly selected newborns from among all live births in 2005, and tracks SHS exposure in utero and when the children were 18 months, 36 months, and 66 months old.

Our results indicate that among the 18-month-old infants, 61.8% of them lived in a household with at least one smoker, with the father being the smoker in 84% of those households. This result confirms previous studies in East Asia indicating that most childhood SHS may come from the father and other household members, whereas 76% of infants living in a smoker household have father being the only smoker, and 14% have other family member and 0.7% have mother being the only smoker [7,21] These results indicate the urgent need to keep homes smoke-free to protect children from SHS exposure. Indeed, banning smoking in the home is found to be associated with a significant reduction in urinary cotinine to creatinine ratio in infants.[22-25] However, smoking restrictions in homes are not mandated by legal regulations, and the voluntary restriction of smoking is usually rare. Efforts are needed to encourage Taiwanese families to adopt their own policy of restricting smoking in the home setting.

Taiwan is similar to many other Asian countries in that the familial values are deeply influenced by Confucianism, with an expectation of respecting the elderly and males to maintain the patriarchal family. This philosophy of Confucianism and patriarchy embedded in Chinese familial values may cause married women and children to be hesitant to change the smoking behavior of their male household members or to ask male smokers to smoke outside of the home.[26,27] Therefore, in addition to providing women with advice and information about the harms of SHS exposure, their husbands, partners and other household members should be informed with the risks of such exposure on pregnant women as well as children. Most importantly, smoking cessation support should be provided to increase the quit rates which ultimately would reduce SHS exposure.[28]

Previous studies have indicated that smoke-free legislation in public places can spill over to the home setting through creating a norm of not smoking around nonsmokers.[16,29-32] Indeed, a few studies found

that the comprehensive smoke-free laws enacted in 2009 in Taiwan reduced adult nonsmokers' SHS exposure in the home and even increased smoking cessation.[11,14] The enforcement of smoke-free environments in many public places may further reduce women and children's SHS exposure at home. In our study, we found that the SHS exposure declined significantly from 12.1% when the children were 36 month olds in 2008 to 9.5% when the children were 66 month olds in 2010-2011. The decreasing patterns were similar when the sample was divided into those who live in smoker versus nonsmoker households. Part of the decrease may result from the implementation of comprehensive smoke-free laws in 2009. Future studies may use the TBCS data to investigate the effect of comprehensive smoke-free laws on children's SHS exposure by comparing the exposure between pre- and post- comprehensive smoke-free laws, controlling for environmental factors and household characteristics.

Our results indicated that the firstborn children are significantly less likely to be exposed to heavy SHS than later-borns are. This finding confirms previous studies indicating that firstborn children tend to receive higher quality care in social, affectionate, and caretaking activities during early childhood than later borns do.[33-35] In addition, the finding of the high in-utero SHS exposure indicates a serious lack of knowledge on and social protection from the harms of SHS exposure during pregnancy, leading pregnant women continually being exposed to SHS.[36-38]

Our results indicated that several factors are significantly associated with heavy early childhood SHS exposure, which allows the specific groups to be targeted by interventions to be identified, for example households with smokers, households with more than one smoker, both parents smoke, parents with lower educational attainment, mothers of younger age, and non-first-born children. More educational

interventions and resources need to be aimed at these target groups to reduce early childhood SHS exposure from their household smokers through education about the health risks from SHS exposure.

A potential limitation this study has is that parents or primary caregivers may underreport infant's SHS due to lack of awareness or social desirability bias. Nevertheless, in our sample, 55.2% of primary caregivers indicated that their children were exposed to SHS, and this prevalence is higher than previously found in Taiwan.[10,13] Another concern regarding systematic bias in childhood SHS exposure may arise if underreporting occurs in a certain demographic or socioeconomic subgroup and not others. However, a study using multiple SHS exposure measures, both self-reporting and serum cotinine level, indicated that exposure patterns by demographic characteristics were similar among those two measures.[39]

CONCLUSIONS

This study investigated the early childhood SHS exposure among 18-month-old infants, a subgroup of young children spending most of their time at home and most likely to be exposed to household SHS through their household members. The results indicate that most early childhood SHS comes from the father and other household members, whereas the smoking rate for women in this study setting is very low. Encouraging families to maintain a smoke-free home environment, empowering women to ensure their perspectives and rights are embedded into tobacco control efforts, and educating families about the health risks from childhood SHS exposure, especially among children living in households with smokers, will protect nonsmoking women and their children from SHS exposure.

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Contributors' Statement:

Kai-Wen Cheng: Dr. Cheng conceived the topic, designed the statistical plans, and drafted the article.

Wan-Lin Chiang: Ms. Chiang did the actual statistical run and conducted the editing during the manuscript preparation.

Tung-liang Chiang: Dr. Chiang initiated the collaborative project, provided critical comments, and revised the draft article.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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Conflicts of Interest: The authors declare that they have no conflict of interest.

Data Sharing Statement: No additional data available.

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Figure 1. Prevalence of early childhood SHS exposure in-utero and afterbith in smoker and non-smoker households. The proportion of young children who were exposed to heavy SHS declined significantly after birth. The percentage of children exposed to heavy SHS is consistently higher for those living in smoker households than for those living in nonsmoker households.

Table 1 Baseline summary descriptive data (measured when the children were 18 months old), N(% and mean±SD)

Variables	Number of Observations	All households	Nonsmoker households	Smoker households
Total	18845	(100.0)	7130 (100.0)	11651 (100.0)
Parent's characteristics				
Father's age (years)	18845	(36.5±13.8)	7130 (35.7±9.1)	11651 (36.9±15.6)
<25	475	(2.5)	53 (0.7)	419 (3.6)
25-29	3440	(18.3)	858 (12.0)	2574 (22.1)
30-34	6592	(35.0)	2729 (38.3)	3859 (33.1)
>=35	8338	(44.2)	3490 (49.0)	4799 (41.2)
Mother's age (years)	18845	(29.9±4.8)	7130 31.4±4.3)	11651 (28.9±4.9)
<25	2707	(14.4)	409 (5.7)	2283 (19.6)
25-29	6117	(32.4)	1848 (25.9)	4251 (36.5)
30-34	6760	(35.9)	3236 (45.4)	3510 (30.1)
>=35	3261	(17.3)	1637 (23.0)	1607 (13.8)
Father's education level				
Junior high or below	2500	(13.3)	409 (5.7)	2079 (17.8)
Senior high	7454	(39.6)	1772 (24.9)	5664 (48.6)
Junior college	4134	(21.9)	1790 (25.1)	2332 (20.0)
College and above	4623	(24.5)	3140 (44.0)	1479 (12.7)
Missing	134	(0.7)	19 (0.3)	97 (0.8)
Mother's education level				
Junior high or below	2637	(14.0)	521 (7.3)	2103 (18.1)
Senior high	7526	(39.9)	1927 (27.0)	5571 (47.8)
Junior college	4797	(25.5)	2147 (30.1)	2638 (22.6)
College and above	3852	(20.4)	2527 (35.5)	1314 (11.3)
Missing	33	(0.2)	8 (0.1)	25 (0.2)
Parents' employment status				
Father employed	18053	(95.8)	6969 (97.7)	11075 (95.1)
Missing	182	(1.0)	9 (0.1)	121 (0.6)
Mother employed	11475	(60.9)	4698 (65.9)	6733 (57.8)
Missing	108	(0.6)	9 (0.1)	92 (0.5)
Parents' smoking status				
Only father smokes	8854	(47.0)	0 (0.0)	8854 (76.0)
Only mother smokes	87	(0.4)	0 (0.0)	87 (0.7)
Both parents smoke	923	(4.9)	0 (0.0)	923 (7.9)
None of them smoke	8760	(46.5)	7130 (100.0)	1630 (14.0)
Missing	221	(1.2)	0 (0.0)	157 (1.4)
Parents' smoking intensity (smokers)				
Father's cigarettes per day	9782	(15.2±9.5)	0 -	9782 (15.2±9.4)
Mother's cigarettes per day	1052	(9.3±6.8)	0 -	1052 (9.3±6.8)
Children's characteristics				
Child being a boy	9912	(52.6)	3765 (52.8)	6114 (52.5)
First-born child				
Yes	9468	(50.2)	3579 (50.2)	5845 (50.2)
No	9367	(49.7)	3551 (49.8)	5796 (49.7)
Missing	10	(0.1)	0 (0.0)	10 (0.1)
Children's SHS exposure				
General SHS exposure				
Never	8441	(44.8)	4439 (62.3)	3961 (34.0)
Ever	10401	(55.2)	2691 (37.7)	7690 (66.0)
Missing	3	(0.0)	0 (0.0)	0 (0.0)
SHS intensity*				
Non-heavy SHS exposure	16659	(88.4)	6968 (97.7)	9632 (82.7)
Heavy SHS exposure	2183	(11.6)	162 (2.3)	2019 (17.3)
Missing	3	(0.0)	0 (0.0)	0 (0.0)
Household characteristics				
Family income (NTD)				
<30,000	2195	(11.6)	449 (6.3)	1705 (14.6)
30,000-100,000	14332	(76.1)	5319 (74.6)	8996 (77.2)
>100,000	2249	(11.9)	1348 (18.9)	900 (7.7)
Missing	69	(0.4)	14 (0.2)	50 (0.4)
Number of smokers in the family	18821	(0.9±1.0)	7130 (0.0±0.0)	11628 (1.4±0.9)

NTD, New Taiwan Dollars, 30 NTD≒1 USD; 40 NTD≒1 GBP

*Heavy SHS: mother reported "often" or "every day" to the question "How often is your baby exposed to secondhand smoke?"; non-heavy SHS: "never" or "occasionally" to that question.

Table 2 Early childhood SHS exposure by household, parental, and children's characteristics, N(%)

Characteristics	Total (n)	Non-heavy SHS	Heavy SHS	p-value
Total	18845	16659 (88.4)	2183 (11.6)	
Parent's characteristics				
Father's age (years)				<.0001
<25	475	373 (78.5)	102 (21.5)	
25-29	3440	2939 (85.4)	501 (14.6)	
30-34	6592	5909 (89.6)	683 (10.4)	
>=35	8338	7438 (89.2)	897 (10.8)	
Mother's age (years)				<.0001
<25	2707	2171 (80.2)	535 (19.8)	
25-29	6117	5281 (86.3)	835 (13.7)	
30-34	6760	6195 (91.6)	564 (8.3)	
>=35	3261	3012 (92.4)	249 (7.6)	
Father's education level				<.0001
Junior high or below	2500	1934 (77.4)	564 (22.6)	
Senior high	7454	6337 (85.0)	1117 (15.0)	
Junior college	4134	3808 (92.1)	325 (7.9)	
College and above	4623	4469 (96.7)	154 (3.3)	
Mother's education level				<.0001
Junior high or below	2637	2076 (78.7)	559 (21.2)	
Senior high	7526	6442 (85.6)	1083 (14.4)	
Junior college	4797	4422 (92.2)	375 (7.8)	
College and above	3852	3689 (95.8)	163 (4.2)	
Parents' employment status				
Father employed	18053	16007 (88.7)	2045 (11.3)	<.0001
Father not employed	610	503 (82.5)	107 (17.5)	
Mother employed	11475	10337 (90.1)	1137 (9.9)	<.0001
Mother not employed	7262	6240 (85.9)	1022 (14.1)	
Parents' smoking status				<.0001
Only father smokes	8854	7404 (83.6)	1450 (16.4)	
Only mother smokes	87	75 (86.2)	12 (13.8)	
Both parents smoke	923	638 (69.1)	285 (30.9)	
None of them smoke	8760	8364 (95.5)	396 (4.5)	
Heavy smoker				
Father	4506	3351 (74.4)	1155 (25.6)	<.0001
Mother	162	80 (49.4)	82 (50.6)	<.0001
Children's characteristics				
Gender				
Boy	9912	8733 (88.1)	1177 (11.9)	0.189
Girl	8932	7926 (88.7)	1006 11.3)	
Birth order				
First-born child	9468	8491 (89.7)	976 (10.3)	<.0001
Non-first-born child	9365	8158 (87.1)	1207 (12.9)	
Household characteristics				
Family income (NTD)				<.0001
<30,000	2195	1781 (81.1)	414 (18.9)	
30,000-100,000	14332	12694 (88.6)	1637 (11.4)	
>100,000	2249	2132 (94.8)	117 (5.2)	
Any smoker present in the household				<.0001
No	7130	6968 (97.7)	162 (2.3)	
Yes	11651	9632 (82.7)	2019 (17.3)	
Number of smokers in the family				<.0001
0	7790	7472 (95.9)	316 (4.1)	
1	7309	6463 (88.4)	846 (11.6)	
2	2513	1927 (76.7)	586 (23.3)	
>=3	1209	778 (64.4)	431 (35.6)	

NTD, New Taiwan Dollars, 30 NTD≒1 USD; 40 NTD≒1 GBP

Table 3 Risk factors for heavy SHS exposure for children in all, smoker, and non-smoker households

	All households	Smoker households	Non-smoker households
Characteristics			
Total			
Parent's characteristics			
Father's age (years) (Ref: <25)			
25-29	0.82 (0.63-1.07)	0.81 (0.62-1.06)	1.54 (0.19-12.45)
30-34	0.86 (0.66-1.13)	0.85 (0.65-1.12)	1.46 (0.18-11.86)
>=35	0.87 (0.66-1.14)	0.88 (0.67-1.16)	1.24 (0.15-10.15)
Mother's age (years) (Ref: <25)			
25-29	0.96 (0.84-1.11)	0.98 (0.85-1.13)	0.99 (0.46-2.13)
30-34	0.84 (0.71-0.99)*	0.84 (0.71-1.00)*	0.93 (0.41-2.09)
>=35	0.76 (0.62-0.92)**	0.75 (0.60-0.92)**	0.97 (0.40-2.32)
Father's education level (Ref: <=Junior high)			
Senior high	0.77 (0.67-0.87)***	0.75 (0.66-0.85)***	2.04 (0.85-4.89)
Junior college	0.58 (0.48-0.69)***	0.56 (0.47-0.67)***	1.35 (0.54-3.41)
College and above	0.37 (0.29-0.48)***	0.33 (0.25-0.43)***	1.10 (0.42-2.86)
Mother's education level (Ref: <=Junior high)			
Senior high	0.80 (0.70-0.92)***	0.80 (0.69-0.91)**	1.02 (0.48-2.14)
Junior college	0.72 (0.61-0.86)***	0.67 (0.55-0.81)***	1.40 (0.64-3.06)
College and above	0.80 (0.62-1.02)	0.84 (0.65-1.10)	0.83 (0.35-1.99)
Parents' employment status			
Father employed (Ref: yes)	1.00 (0.78-1.29)	0.99 (0.76-1.29)	1.21 (0.42-3.49)
Mother employed (Ref: yes)	1.10 (0.99-1.21)	1.18 (1.06-1.32)**	0.46 (0.31-0.68)***
Parents' smoking status (Ref: None of them smoke)			
Only father smoke		0.87 (0.74-1.01)	
Only mother smoke		0.63 (0.32-1.22)	
Both parents smoke		1.62 (1.30-2.00)***	
Children's characteristics			
Child being a boy (Ref: Girl)	1.07 (0.97-1.18)	1.07 (0.96-1.18)	1.04 (0.76-1.43)
First-born child (Ref: no)	0.73 (0.66-0.81)***	0.74 (0.67-0.83)***	0.62 (0.44-0.87)**
Household characteristics			
Family income (NTD) (Ref: <30,000)			
30,000-100,000	0.97 (0.83-1.12)	0.98 (0.84-1.13)	0.88 (0.43-1.82)
>100,000	0.88 (0.68-1.13)	0.88 (0.67-1.16)	0.77 (0.32-1.82)
Any smoker present in the household (Ref: no)	3.79 (3.03-4.73)***		
Number of smokers in the family	1.45 (1.38-1.53)***	1.45 (1.38-1.53)***	

*p<0.05; **p<0.01;***p<0.001

NTD, New Taiwan Dollars, 30 NTD≒1 USD; 40 NTD≒1 GBP

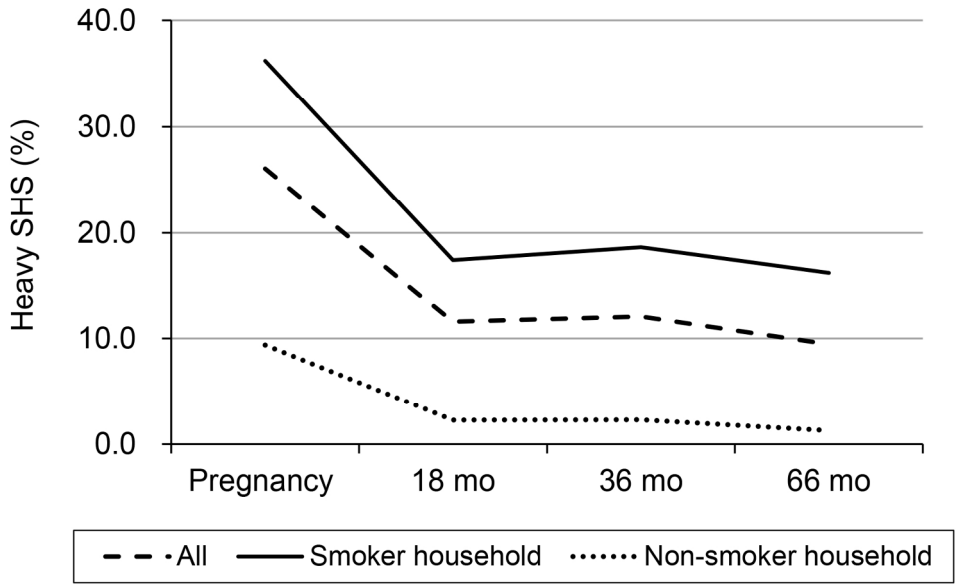

Figure 1. Prevalence of early childhood SHS exposure in-utero and afterbith in smoker and non-smoker households. The proportion of young children who were exposed to heavy SHS declined significantly after birth. The percentage of children exposed to heavy SHS is consistently higher for those living in smoker households than for those living in nonsmoker households.

173x105mm (300 x 300 DPI)

核准機關：行政院主計處 95／06／08
核准文號：處普三字第 0950003570 號函核准
有效期間：96 年 12 月 31 日止
辦理機關：行政院衛生署國民健康局

樣本編號：（訪員填寫）

A							
	鄉鎮區代碼				序列號		

民國 95 年嬰幼兒健康照護需求第二次調查

(18 個月大幼兒)

幼兒姓名：_____ 幼兒性別：□1 男 □2 女

回答本問卷者	姓名		與幼兒之關係		性別	□1. 男 □2. 女	年齡	歲
	地址	_____縣市 _____鄉鎮市區 _____村里 _____路街 _____段 _____巷 _____弄 _____號 _____樓						
	電話	（1）_____ （2）_____ （3）_____						

幼兒目前居住地區是：□1 都市、城市 □2 鎮、鄉的街上 □3 鄉村、農村

有無事先郵寄「給受訪者的信」？□1 有 □0 沒有

前往訪視次數：計_____次 完訪訪員姓名：_____

本問卷是否一次完成？□1 是 □0 否→分幾次完成：_____次 最後完成日期：_____月_____日

是否為轉介案: □1. 原分配本調查員之個案 □2. 其他調查員轉入之遷移案

有無越區訪問: □1. 沒有 □2. 有→ _____ 縣市 _____ 鄉鎮市區

嬰兒發展評量表 □1. 完成 □2. 無法完成

母親健康自覺問卷 □1. 完成 □2. 完成（多胎另填） □3. 無法完成

父親健康自覺問卷 □1. 完成 □2. 完成（多胎另填） □3. 無法完成

下面訪員請勿填寫

補訪問題號碼及核閱員註記		初閱者：_____ 日期：____年____月____日 輔導員：_____ 日期：____年____月____日 複閱者：_____

		日期：____年____月____日 過錄者：_____ 日期：____年____月____日

【本頁由訪員自行填寫】

確認代答者或尋求代答者

X1. 這一本問卷的訪問對象是：

□1 幼兒生母**【跳填 X4】**

□2 代答者**(代答者必須是幼兒的主要照顧者)【續填 X2、X3】**

□3 幼兒生母與代答者**【續填 X2、X3】**

X2 本問卷不是由幼兒生母回答的主要原因是：

□1 婚變因素，生母沒有和幼兒住在一起
□2 婚變以外的其他因素，生母已和幼兒分開
□3 生母死亡
□4 生母重聽、耳聾、啞巴
□5 生母為外國籍且語言無法溝通
□6 生母有嚴重精神問題或心智不正常
□7 生母出國，於訪問截止日之前不會回來
□8 其他(請寫出)：_____

X3 代答者是幼兒的什麼人？

□01 生父 □04 繼母 □11 祖父 □13 外祖父
□02 繼父 □05 養母 □12 祖母 □14 外祖母
□03 養父
□其他家人
□其他親人
□其他非親戚

X4. 幼兒母親現住地址是否與問卷封面【回答本問卷者】註記之地址相同？

□1 相同**【跳填 X5】**
□2 不同

X4a. 幼兒母親現住地址

_____

X5. 幼兒母親聯絡電話是否與問卷封面【回答本問卷者】註記之電話相同？

□1 相同**【跳填 A 節】**
□2 不同

X5a. 幼兒母親聯絡電話

(1)_____ (2)_____ (3)_____

訪問開始時間：□1 上午 □2 下午 _____時_____分(24 小時制)

導言：_____(幼兒姓名)這個寶寶大約六個月的時候，我們為瞭解寶寶的情形，曾來訪問過，也謝謝您們接受我們訪問。現在寶寶也差不多一歲半了，我們為瞭解他（她）的成長發育狀況，以協助政府規劃照顧媽媽及小寶寶的計畫，所以再來打擾一下。

A. 寶寶的生長發育

A1. 我們想先瞭解寶寶出生後至今的生長發育狀況，**請您讓我參考寶寶的兒童健康手冊**，以抄錄他（她）在 6 個月、12 個月和 18 個月時的體重、身長和頭圍。**(請訪員參考兒童健康手冊第 5 頁的生長紀錄表，將各成長時期、或該成長時期加減一個月、或最靠近該成長時期的實際測量日期、足月、頭圍、身高及體重登錄在下表中)**

	測 量 日 期	足 歲(月)	頭圍（公分）	身高（公分）	體重（公斤）	資料來源
A1_1. 6±1 個月	____年___月____日	____月____天	_____	_____	_____	□1 健康手冊 □2 個案口述 □3 沒有資料
A1_2. 12±1 個月	____年___月____日	____月____天	_____	_____	_____	□1 健康手冊 □2 個案口述 □3 沒有資料
A1_3. 18±1 個月	____年___月____日	____月____天	_____	_____	_____	□1 健康手冊 □2 個案口述 □3 沒有資料

A2. 我們想瞭解寶寶出生後至今接種疫苗的狀況，**請您讓我參考寶寶的兒童健康手冊**，以登錄他（她）曾經接種過的疫苗。**(請訪員參考兒童健康手冊第 32 頁預防接種時程及紀錄表，並抄錄寶寶從出生至今曾經接種過的疫苗和接種日期)**

預防接種時程與紀錄表（A2 題）

適合接種年齡	疫苗種類		接種日期	下次接種建議日期	接種單位
出生 24 小時內	☐B 型肝炎免疫球蛋白	一劑	年 月 日		
出生 24 小時後	☐卡介苗	一劑	年 月 日		
出生滿 2 天	☐B 型肝炎疫苗	第一劑	年 月 日		
出生滿 1 個月	☐B 型肝炎疫苗	第二劑	年 月 日		
出生滿 2 個月	☐白喉破傷風百日咳混合疫苗	第一劑	年 月 日		
	☐小兒麻痺口服疫苗	第一劑	年 月 日		
出生滿 4 個月	☐白喉破傷風百日咳混合疫苗	第二劑	年 月 日		
	☐小兒麻痺口服疫苗	第二劑	年 月 日		
出生滿 6 個月	☐B 型肝炎疫苗	第三劑	年 月 日		
	☐白喉破傷風百日咳混合疫苗	第三劑	年 月 日		
	☐小兒麻痺口服疫苗	第三劑	年 月 日		

適合接種年齡	疫苗種類		接種日期	下次接種建議日期	接種單位
出生滿 9 個月	☐麻疹疫苗	一劑	年 月 日		
出生滿 12 個月	☐水痘疫苗	一劑	年 月 日		
	☐麻疹腮腺炎德國麻疹混合疫苗	第一劑	年 月 日		
	☐日本腦炎疫苗	第一劑			
	☐日本腦炎疫苗	隔二周第二劑	年 月 日		
出生滿 1 年 6 個月	☐白喉破傷風百日咳混合疫苗	第四劑	年 月 日		
	☐小兒麻痺口服疫苗	第四劑	年 月 日		

＊各項新增或自費接種疫苗登錄

適合接種年齡	疫苗種類	劑別	接種日期	下次接種建議日期	接種單位
出生滿 個月	☐	第 劑	年 月 日		
出生滿 個月	☐	第 劑	年 月 日		
出生滿 個月	☐	第 劑	年 月 日		
出生滿 個月	☐	第 劑	年 月 日		
出生滿 個月	☐	第 劑	年 月 日		
出生滿 個月	☐	第 劑	年 月 日		

A3. 請問寶寶長第一顆牙齒是第幾個月大的時候？第_____個月

A4. 請問寶寶目前已經長幾顆牙齒？已有_____ 顆 ☐ 20 顆全都已經長齊

A5. 請問寶寶**現在**會做出下面我提到的行為或動作嗎？**【訪員請拿出圖文顯示卡，讓受訪者瞭解每一個行為或動作】**

A5a. **【若會】第一次**出現這個行為是在出生後滿幾個月？【可以有小數點，如寶寶一歲六個半月會用筆亂塗，則記為 18.5 月。】**【逐項詢問】**

行為動作	A5. 小寶寶**現在**會做出這個行為了嗎?		A5a. 小寶寶**第一次**出現這個行為是在出生後滿幾個月?
	0 還不會 **【跳問下題】**	1 會 ↳	
1. 雙手扶著家俱會走幾步	0	1	_____個月
2. 可以走得很穩	0	1	_____個月
3. 拍手	0	1	_____個月
4. 會用筆亂塗	0	1	_____個月
5. 以揮手表示「再見」	0	1	_____個月
6. 會有意義的叫爸爸、媽媽	0	1	_____個月
7. 叫他，他會來	0	1	_____個月
8. 會雙手端著杯子喝水	0	1	_____個月

B. 寶寶的生活照顧

B1. 請問寶寶從他（她）六個月到一歲及一歲以後到現在一歲半(18 個月) 這兩段期間，白天主要是由誰照顧?

B2. 請問寶寶從他（她）六個月到一歲及一歲以後到現在一歲半(18 個月) 這兩段期間，晚上主要是由誰照顧？

【本節以單選為主，若無法界定誰是主要照顧者，或是有共同照顧情形發生，則最多兩位，並請於下表內勾選之】

是這個**寶寶的**什麼人？	**B1. 白天**主要照顧者		**B2. 晚上**主要照顧者	
	B1a 6 至 12 個 月	B1b 13 至 18 個 月	B2a 6 至 12 個 月	B2b 13 至 18 個 月
(1)母親				
(2)父親				
(3)外公				
(4)外婆				
(5 祖父				
(6)祖母				
(7)本地幫傭（指到宅幫傭）				
(8)外籍幫傭				
(9)幼稚園/托兒所/托嬰中心/外送保母				
(10)其他 (請寫出)_____				

【訪員注意：寶寶如果是給親戚、朋友，或鄰居照顧，且收取保母費用，本題應圈選第(9)項外送保母，而不是第(10)項的其他】

B3. 請問您們 (**寶寶父母**)目前的婚姻狀況是：

□1 已婚，夫妻 (**寶寶父母**) 同住

□2 已婚，夫妻 (**寶寶父母**) 不同住

□3 已離婚
□4 寶寶父親已過世
□5 寶寶母親已過世

B3a. 那目前寶寶的戶籍跟誰？

□1 跟父親
□2 跟母親
□3 其他 **【跳問 B5】**
(請寫出)_____

B3b 那這位父親或母親的婚姻狀況是：

B4. 寶寶目前（大部分時間）是不是跟爸爸媽媽住在一起？

□1 跟爸爸和媽媽同住
□2 只跟爸爸住
□3 只跟媽媽住

B4a. 那麼平常家裡還有誰和寶寶同住？是寶寶的什麼人？**【可複選】**

□0 除寶寶的父或母親外，無其他人
□1 祖父 □4 外婆 □7 本地幫傭
□2 祖母 □5 寶寶兄弟姐妹 □8 外籍幫傭
□3 外公 □6 其他親屬 □9 其他

B4b. 換句話說，包括寶寶在內，平時家裡共有幾個人住在

□4 有些時候才跟爸爸媽媽住，大部份時間沒有

B4c. 那麼平常寶寶住在誰的家裡？
□1 祖父母 □3 其他親屬 □5 其他(請寫出)_____
□2 外祖父母 □4 保母

B4d. 換句話說，包括寶寶在內，平時那個家裡共有幾個人住在一起？

共有_____人住在一起

□5 沒有跟爸爸，也沒有跟媽媽住

B4e. 那麼平常寶寶住在誰的家裡？
□1 祖父母 □3 其他親屬 □5 其他(請寫出)_____
□2 外祖父母 □4 保母

B4f. 換句話說，包括寶寶在內，平時那個家裡共有幾個人住在一起？

共有_____人住在一起

B5. 請問目前您（寶寶母親）每週跟寶寶相處幾天？_____天；除了睡覺以外，每天大約相處幾小時?_____小時。

B6. 請問目前寶寶父親每週跟寶寶相處幾天？_____天；除了睡覺以外，每天大約相處幾小時?_____小時。

B7. 請問您（寶寶生母）在生了這個孩子後，是否曾經請過育嬰假？

□1 是 → B7a. 總共請多久的育嬰假? _____個月又_____天

□2 否

□3 原本就沒有工作、或懷這胎或產後即未再工作**【跳問 B10】**

B8. 請問您（**寶寶生母**）產後多久回去工作？ 產後_____個月；

□77 目前仍在育嬰假中

B9. 在這個孩子出生**後**，您(寶寶母親)是否曾經辭過工作？

□1 是 □2 否**【跳問 B10】**

B9a. 您辭掉工作的理由是：**【可複選，至多三項】**

□1 又懷孕了
□2 自己健康不佳/太疲勞
□3 為了全心全意照顧孩子
□4 孩子托育問題
□5 雇主問題
□6 想換工作，而且已經換工作了
□7 想換工作，目前還沒找到理想的
□8 其他 (請說明)_____

B10. 在臨時有需要的時候，您(寶寶母親）是否能夠找到別人（不含同住家人）暫（臨）時幫您照顧寶寶？

□1 一直都無法找到 □3 有時可以 □4 常常可以找到
□2 常常無法找到 □5 一定可以找到

B11.**【問卷回答者是寶寶母親】**您覺得有多少把握勝任媽媽的角色？

【問卷回答者不是寶寶母親】您覺得寶寶母親，勝任媽媽的角色的可能性有多大？

□1 很有把握/很有可能 □3 普通 □4 不太有把握/不太有可能
□2 還算有把握/還算有可能 □5 幾乎沒有把握/幾乎沒有可能
□8.不適用（例如：母親已死亡、與寶寶分開不同住或不知去向等）

B12.**【問卷回答者是寶寶父親】**您覺得有多少把握勝任爸爸的角色？

【問卷回答者不是寶寶父親】您覺得寶寶父親，勝任爸爸的角色的可能性有多大？

□1 很有把握/很有可能 □3 普通 □4 不太有把握/不太有可能
□2 還算有把握/還算有可能 □5 幾乎沒有把握/幾乎沒有可能
□8.不適用（例如：父親已死亡、與寶寶分開不同住或不知去向等）

C.托育評估

C1. 請問您的寶寶目前有沒有送去幼稚園/托兒所/托嬰中心/保母家給人家帶？**【訪員注意：本題請和第 3 頁 B1、B2 表中的第 10 項查核，須 B1b 或 B2b 第 9 項有圈選的才算有送去幼稚園/托兒所/托嬰中心/保母家給人家帶】**

□0 沒有

□1 有，送去保母家**【跳問 C2】**

□2 有，送去幼稚園/托兒所/托嬰中心

c1a. 機構名稱是：_____縣市_____鄉鎮市區_____**【跳問 C2】**

C1b. 請問您們有沒有考慮過要將寶寶送去幼稚園/托兒所/托嬰中心/保母家給人家帶？

□0 沒有

□1 有**【跳問 D 節】**

C1b1.為什麼沒有考慮把寶寶送去給人家帶？

□1 想要自己帶孩子
□2 找不到適合的人帶孩子
□3 托育費用太高
□4 其他(請說明)_____**【跳問 D 節】**

C2. 目前寶寶去的這個幼稚園/托兒所/托嬰中心/保母家，是您們托育寶寶的第一個地方嗎？

□0 是**【跳問 C3】**

□1 否

C2a. 您們為什麼會換地方呢? **【可複選，至多三個】**

□1. 老師/保母不會帶您的孩子
□2. 老師/保母態度不好
□3. 孩子不適應
□4. 太貴了
□5. 發現有更好的機構/保母
□6. 搬家
□7. 決定帶回家自己帶
□8. 其他(請寫出)

C3. 請問您們當初**主要**是如何選到這個地方的？

□1 自己找的
□2 親友鄰居推薦的
□3 看到宣傳單
□4 生產前後醫護人員推薦
□5 向政府有關單位的資訊網查詢的
□6 他們主動來您家宣傳的
□7 其他(請寫出)_____

C4. 請問您們當初選擇這個托嬰中心/保母最重要的原因是？**【可複選，至多三個】**

□1 離家近，接送方便
□2 價格合理
□3 口碑好，有人推薦
□4 收托時間適當
□5 老師/保母有證照
□6 機構收托的孩子人數不多
□7 環境好、設備全
□8 其他(請寫出)_____

C5. 請問這個寶寶目前每個月平均所需托育費用是多少（含幼稚園/托兒所/托嬰中心/保母幫忙帶小孩，含年節送給保母的禮金）？

□1 不到 5 千元
□2 5 千元～未滿 1 萬元
□3 1 萬元～未滿 2 萬元
□4 2 萬～未滿 3 萬元
□5 3 萬元以上

C6. 請問您是否滿意現在這個幼稚園/托兒所/托嬰中心/保母的托育服務？

□1 很滿意
□2 還算滿意
□3 普通
□4 不太滿意
□5 很不滿意

C7. 請問您**最滿意**這個幼稚園/托兒所/托嬰中心/保母的地方是：**【可複選，至多三個】**

□1 給孩子吃得好
□2 很用心帶小孩
□3 和您的溝通良好
□4 價格合理
□5 收托的時間有彈性
□6 離家近
□7 環境整潔衛生安全
□8 孩子很喜歡去
□9 其他孩子不多，您的小孩可以得到較多照顧
□10 其他(請寫出)_____

C8. 請問您覺得這個托育服務，對您(寶寶的媽媽或爸爸)來說幫助最大的地方是：**【可複選，至多三個】**

□1 讓您可以安心上班或做我要做的事
□2 讓您可以有個喘息的機會
□3 跟別人相處，對孩子的成長有好處
□4 有專家幫您一起照顧孩子
□5 有人可以討論有關帶孩子的事
□6 孩子多一個疼愛他的家庭
□7 其他(請寫出)_____

C9.**【寶寶是送到保母家者, 免問本題】**請問您知不知道這個**幼稚園/托兒所/托嬰中心**有沒有立案？

□1 不知道
□2 沒有立案/證照
□3 有 →

D9a. 是哪一個單位核發的？

□1 社會局
□2 建設局
□3 教育局
□4 不清楚

C10. 就您的瞭解，照顧您寶寶的老師/保母，平均同一時間每人平均照顧幾個六歲以下的小孩（含保母自己照顧的六歲以下小孩）？

□1 一個 □3 三個 □5 五個以上
□2 二個 □4 四個 □6 不清楚

C11. 就您所知，照顧您寶寶的老師/保母是不是有幼教證照或保母證照？

□ 1 有 □2 沒有 □3 不清楚

C12. 請問這個幼稚園/托兒所/托嬰中心/保母家，平常是否有人抽菸？

□1 沒有 □2 偶而有 □3 經常有 □4 天天有

D. 寶寶的生活型態

D1. 請問您(寶寶媽媽)現在還有沒有在餵寶寶吃母奶？

□0 沒有 □1 有 **【跳問 D2】**

D1a. 請問您(寶寶媽媽)在寶寶多大時完全停止餵他（她）吃母奶？
_____個月大

D2. 請問您目前是否有餵寶寶吃牛奶、羊奶或其他奶製品？

□0 沒有 **【跳問 D3】** □1 有

D2a. 請問是**主要**是那一種牛奶或羊奶或其它奶製品？

□1 鮮牛奶 □4 優酪乳
□2 鮮羊奶 □5 羊奶粉
□3 嬰幼兒奶粉 □6 其他 _____

D2b. 請問您的寶寶通常一個星期吃幾次奶製品？

□1 每週 1 次以下 □3 每週 3～5 次
□2 每週 1～2 次 □4 每天或幾乎每天吃

D2c. 請問寶寶目前有沒有在吃適合過敏體質的特殊奶粉？

□ 0 沒有 **【跳問 D3】** □1 有

D2d. 請問是不是**醫生建議**您的寶寶要吃**過敏體質**的特殊奶粉？

□0 不是

D2d1. 請問寶寶目前吃那種特殊奶粉？

□1 低過敏半水解奶粉
□2 低過敏全水解奶粉
□3 止瀉奶粉(黃豆配方)
□4 其他(請說明)_____

D3. 請問寶寶目前是否有吃下列這些種類的食物?通常一個星期吃幾次呢？

食品種類	0.從來不吃	1.每週 1 次以下或很少吃	2.每週 1～2 次	3.每週 3～5 次	4.每天或幾乎每天吃
1 肉類	0	1	2	3	4
2 魚、蝦等海鮮類	0	1	2	3	4
3 豆類或豆類製品	0	1	2	3	4
4 蛋類	0	1	2	3	4
5 五穀根莖類	0	1	2	3	4
6 蔬菜類	0	1	2	3	4
7 水果類	0	1	2	3	4

D4. 請問**過去一年內**，您們有沒有給寶寶吃營養補充劑？

□0 無

□1 有 →

D4a. 請問寶寶吃的是哪一種營養補充劑？**【可複選】**

□1 綜合維生素　□4 比菲多益菌
□2 魚肝油　□5 其他(請說明)
□3 鈣粉　_____

D5. 寶寶**目前**有沒有吸安撫奶嘴？

□0 從來沒有吃 **【跳問 D6】**

□1 以前有吃，現在已沒吃 →

D5a. 請問寶寶多大時完全停止吸安撫奶嘴？
_____歲又 _____個月大

D5b. 那寶寶有沒有改而吸吮手指？
□1 沒有　□3 偶而吸
□2 很少吸　□4 每天都吸

【跳問 D6】

□2 目前有吃 →

D5c. 請問寶寶吸安撫奶嘴的頻率是：
□1 每天都吸　□2 偶而吸　□3 已經很少吸

D6. 請問目前寶寶每天睡眠時間，包括白天、晚上總共大約睡幾小時？

大約_____小時

D7. 目前寶寶平常晚上睡覺時，寶寶房間內是否有燈光呢？

□1 完全沒有燈光 □2 有微弱燈光 （如夜燈） □3 有明亮燈光

D8. 寶寶目前的睡眠習慣，有沒有給您(主要照顧者)造成困擾？

□1 非常困擾 □2 有些困擾 □3 不太有困擾 □4 完全沒有困擾

D9. 請問寶寶目前平均每天看電視的時間大約多久？（包括看錄影帶、影碟等都算；而寶寶在保母或托育機構看電視的時間也要算在內）：約_____小時_____分鐘

D10. 寶寶目前排便習慣是每天排便一次、每天幾次、還是幾天才排便一次?

□1 每天排便一次

□2 每天排便_____次**【請填寫每天排便次數】**

□3 ____天才排便一次**【請填寫幾天才排便一次之天數】**

D11. 過去一年內，寶寶是否曾經因為**便秘**而去看醫生？

□0 否 □1 是

D11a. 過去一年內，總共去看過幾次?

□1 一次

□2 二次

□3 三次或三次以上

D12. 過去一年內，寶寶是否曾經因為**腹瀉**而去看醫生？

□0 否 □1 是

D12a. 過去一年內，總共去看過幾次?

□1 一次

□2 二次

□3 三次或三次以上

D12b. 最嚴重的那一次腹瀉，大約持續幾天?

_____天

E. 寶寶的健康與就醫狀況

E1. 這個寶寶現在已經約一歲半了，整體而言，您認為他/她的健康狀況是很好、好、普通、不太好，還是很不好？

□1 很好 □2 好 □3 普通 □4 不太好 □5 很不好

E2. 整體而言，您認為他/她好不好帶？是很好帶、好帶、普通、不太好帶，還是很不好帶？

□1 很好帶 □2 好帶 □3 普通 □4 不太好帶 □5 很不好帶

E3. 過去一年內（6 個月到 18 個月之間），寶寶是否曾發生過下列我所提到的病症？**【逐項詢問**下表每一項疾病，若「有」該項疾病，務請續問表中接續下去的問題**】**。

疾病或症狀	E3.小寶寶是否曾經有這個病症?		E3a.這個病症有沒有經過醫生診斷/治療?		E3b.是屬於哪一種? **【可複選】**
	0 沒有 **【跳問下一個病症】**	1 有	0 沒有	1 有	
1. 發燒感染疾病	0	1	0	1	□1 泌尿道感染 □2 中耳炎 □3 肺炎 □4 細支氣管炎 □5 川崎症 □6 哮吼 □7 上呼吸道感染 □8 扁桃腺發炎 □9 其他(請說明)_____
2. 腸胃疾病	0	1	0	1	□1 腸套疊 □2 腸胃炎 □3 其他(請說明)_____
3. 皮膚病或皮膚過敏病	0	1	0	1	□1 異位性皮膚炎 □2 病毒疹 □3 皮膚血管瘤 □4 其他(請說明)_____
4. 痙攣	0	1	0	1	□1 單純發燒性痙攣 □2 腦膜炎/腦炎 □3 癲癇(含出生時的病因) □4 其他(請說明)_____

5. 心臟病	0	1	0	1	□1 先天性心臟病 □2 心律不整 □3 其他(請說明)_____
【訪員查核】 □1 寶寶非早產兒**【跳問 E4】** □2 寶寶是早產兒					
疾病或症狀	E3.小寶寶是否曾經有這個病症?		E3a.這個病症有沒有經過醫生診斷/治療?		E3b.是屬於哪一種? **【可複選】**
6. 早產兒相關疾病	0	1	0	1	□1 視網膜病變 □2 慢性肺疾 □3 腦部疾病(腦性麻痺，水腦..) □4 壞死性腸炎 □5 其他(請說明)_____

E4. 請問寶寶有沒有領重大傷病卡？

□0 無 □1 有**【請註明病名】**，_____

E5. 當寶寶身體不舒服時，通常您會直接帶他去看醫生，或是自己照顧他？

□1 直接去看醫生 □4 不一定

□2 自己照顧 □5 其他(請說明)_____

□3 不理它

E6. 過去一年內，當寶寶要看醫生的時候，您們是否固定帶他（她）到某家醫院或診所？

【可複選】

□0 否**【跳問 E7】** □1 是，固定的醫院 □2 是，固定的診所

E6a.是那一家醫院?

_____縣市_____鄉鎮市區

_____ 醫院

E6b.您帶寶寶從家裡到這個醫院看醫生，交通上通常需要花多少時間？

_____小時_____分鐘

E6c.是那一家診所?

_____縣市_____鄉鎮市區

_____ 診所

E6d.您帶寶寶從家裡到這個診所看醫生，交通上通常需要花多少時間？

_____小時_____分鐘

E7. 寶寶在**過去一年內**（6 個月到 18 個月之間），是否曾經掛過急診?

☐0 否 ☐1 是 ⟶ E7a. 急診幾次? _____次

E8. 寶寶在**過去一年內**（6 個月到 18 個月之間），是否曾經住過院?

□0 否 **【跳問 E9】** □1 是

E8a. 共住院幾次？ _____次

E8b. 是什麼原因?

E8c. 是他/她多大的時候? 【若住院超過三次，請詢問**從最近一次算起的三次**住院狀況】。

	E8b. 住院原因	E8c. 住院月齡
最近一次	_____	_____歲又_____個月
再上一次	_____	_____歲又_____個月
再上上一次	_____	_____歲又_____個月

E8d. 寶寶是否曾因手術而住院？

□0 否 □1 是

E9. 寶寶在**過去一年內**（6 個月到 18 個月之間），是否曾接受過輸血？

□0 否 **【跳問 E10】** □1 是

E9a. 請問寶寶接受輸血的原因為何？**【可複選】**

□1 手術 □4 外傷出血

□2 白血病 □5 其他先天性貧血

□3 地中海型貧血 □6 其他(請說明)_____。

E10. 寶寶在**過去一年內**（6 個月到 18 個月之間），是否曾經因為跌倒或其他事故傷害而去**接受醫師治療**的呢？中醫、西醫、國術館、接骨所都算。

□0 否 **【跳問 E11】** □1 是

E10a. 過去一年內，總共發生過幾次事故傷害，並且有到醫療院所處理的呢? 有_____次

E10b1.那是因為哪種事故傷害類型而**到醫療院所**處理的？**【可複選】**

□1 跌倒墜落
□2 交通事故
□3 尖利物刺割傷
□4 燒燙傷
□5 物體或人撞擊
□7 器物夾壓
□8 小物品、食品、異物之梗塞
□9 溺水
□10 誤食藥物、清潔劑、殺蟲劑
□11 其他(請說明)_____

E10b. 其中有幾次**住院**？ □0 否 **【跳問 E11】** □1 有，共_____次

E10b1.那是因為哪種事故傷害類型而**住院**？**【可複選】**

□1 跌倒墜落
□2 交通事故
□3 尖利物刺割傷
□4 燒燙傷
□5 物體或人撞擊
□6 動物咬傷抓傷螫傷
□7 器物夾壓
□8 小物品、食品、異物之梗塞
□9 溺水
□10 誤食藥物、清潔劑、殺蟲劑
□11 其他(請說明)_____

E11.整體而言，寶寶看病或住院都要花錢，對您們(寶寶的媽媽爸爸)來說，這種**經濟壓力**重不重？

□1 壓力非常重
□2 有一點重
□3 普通
□4 不太有壓力
□5 完全沒有壓力

F. 父母親的工作型態與經濟壓力

F1. 請問您（寶寶母親）**過去一年**有沒有在工作？是一直都有，大部份時間有，約半年時間有，小部份時間有，或一直都沒有在工作？

☐1 一直都有　☐3 約半年時間有　☐4 小部份時間有

☐2 大部份時間有　☐5 一直都沒有

F2. 請問您（寶寶母親）目前有沒有在工作？

☐0 沒有 **【跳問 F3】**　☐1 有

F2a.您（寶寶母親）目前主要工作的地方是做什麼的？(指公司、機關或事業的性質)

行業：_____

F2b. 您（寶寶母親）在那裡是擔任什麼工作或職位？(請詳細記錄具體**職位)**：

職業：_____

F2c.您（寶寶母親）主要工作的身分是：

☐1 受政府僱用者　☐4 自營作業者(下無員工)

☐2 受私人僱用者　☐5 雇主(下有員工)

☐3 無酬家屬工作者

F2d. 您（寶寶母親）主要工作的地方有多少員工？

☐1 少於 30 人　☐2 30 人以上

F2e. 您（寶寶母親）平均每週上班幾天?每天上班時間幾小時？（包括加班及所有兼差工作）

每週_____天；每天_____小時（即每週平均工作_____小時）

F2f. 您（寶寶母親）的工作時間是：

☐1 白天　☐3 白天、晚上輪流

☐2 晚上　☐4 白天、晚上都工作

F2g. 您（寶寶母親）同不同意「您這份主要職位或工作有保障、很穩定」？

☐1 很同意　☐3 不同意

☐2 同意　☐4 很不同意

F2h. 您（寶寶母親）的主要工作收入是：

□1 固定薪資（含基本薪與各種固定加給）
□2 固定底薪加上績效獎金、紅利或加班費
□3 無底薪，按件計酬或按時計酬
□4 其他(請說明)_____

F2i. 您（寶寶母親）覺得目前的工作壓力對您來說重不重？

□1 非常重 □3 普通 □4 不太有壓力
□2 有點重 □5 完全沒有壓力

F2j. 您（寶寶母親）覺得目前的工作會不會影響您照顧小孩？

□1 從來不會 □3 有時會 □4 常常會
□2 很少會 □5 一直都會

F2k.請問您（寶寶母親）工作的地方有沒有哺集乳室？

□0 沒有 □1 有

F3. 請問您（寶寶母親）有沒有加入公保或勞農保？

□0 無 □3 農保 □6 漁保
□1 公保 □4 軍保
□2 勞保 □5 福保

F4. 請問您（寶寶母親）有沒有加入全民健保？

□0 沒有 □1 有

F5. **【訪員查核】** □1 寶寶母親目前有工作**【跳問 F6】**

□2 寶寶母親目前有工作，但每週平均工作時數低於 35 小時**【跳問 F6】**

□3 留職停薪**【跳問 F6】**

□4 寶寶母親目前沒有工作

F5a. 您（寶寶母親）目前沒有工作的主要原因是什麼呢？

□1 原本就沒有工作 □6 無工作能力
□2 學生 □7 其他原因（說明原因）_____
□3 為照顧寶寶而把工作辭掉
□4 季節性（週期性）休業、暫時停工
□5 失業（能工作、想工作、尚未再找到工作）

F6. 請問寶寶父親目前有在工作嗎？

□0 沒有 **【跳問 F7】** □1 有

F6a. 寶寶父親目前主要工作的地方是做什麼的？(指公司、機關或事業的性質)

行業：_____

F6b. 寶寶父親在那裡是擔任什麼工作或職位？(請詳細記錄具體**職位)**：

職業：_____

F6c. 寶寶父親主要工作的身分是：

□1 受政府僱用者 □4 自營作業者(下無員工)
□2 受私人僱用者 □5 雇主(下有員工)
□3 無酬家屬工作者

F6d. 寶寶父親主要工作的地方有多少員工？

□1 少於 30 人 □2 30 人以上

F6e. 寶寶父親平均每週上班幾天?每天上班時間幾小時？（包括加班及所有兼差工作）每週_____天；每天_____小時（即每週平均工作_____小時）

F6f. 寶寶父親的工作時間是：

□1 白天 □3 白天、晚上輪流
□2 晚上 □4 白天、晚上都工作

F6g. 寶寶父親的主要工作收入是：

□1 固定薪資（含基本薪與各種固定加給）
□2 固定底薪加上績效獎金、紅利或加班費
□3 無底薪，按件計酬或按時計酬
□4 其他(請說明)

F7. 請問您（寶寶父親）有沒有加入公保或勞農保？

□0. 無 □3. 農保 □6 漁保
□1. 公保 □4. 軍保
□2. 勞保 □5. 福保

F8. 請問您（寶寶父親）有沒有加入全民健保？

□0. 沒有 □1. 有

F9. 【訪員查核】 □1 寶寶父親目前有工作【跳問 F10】

□2 寶寶父親目前有工作，但每週平均工作時數低於 35 小時【跳問 F10】

□3 留職停薪【跳問 F10】

□4 寶寶父親目前沒有工作

F9a. 寶寶父親目前沒有工作的主要原因是什麼呢？

□1 學生
□2 為了照顧寶寶而把工作辭掉
□3 服役（義務兵役）
□4 退休了
□5 季節性（週期性）休業、暫時停工
□6 失業（能工作、想工作、尚未再找到工作）
□7 無工作能力
□8 原本就沒有工作
□9 其他原因（說明原因）_____

F10. 請問你們夫妻倆人（寶寶的爸爸媽媽）**最近一年**平均每個月的收入，大約有多少：

□1 不到 1 萬元
□2 1 萬～未滿 2 萬元
□3 2 萬元～未滿 3 萬元
□4 3 萬元～未滿 5 萬元
□5 5 萬元～未滿 7 萬元
□6 7 萬元～未滿 10 萬元
□7 10 萬元～未滿 15 萬元
□8 15 萬元～未滿 20 萬元
□9 20 萬元以上

F11. 您（們）照顧這個幼兒的所有花費（包含保母與托育費、飲食、衣物尿布用品及醫療等費用）每月大約多少？ _____元

F12. 就您們夫妻倆人（寶寶的爸爸媽媽）的收入而言，您覺得照顧這個幼兒所需要的花費，對您們來說**經濟壓力**重不重？

□1 非常重
□2 有點重
□3 普通
□4 不太有壓力
□5 完全沒有壓力

F13. 整體而言，您覺得目前您們家（寶寶的爸爸媽媽）的**經濟壓力**重不重？

□1 非常重
□2 有點重
□3 普通
□4 不太有壓力
□5 完全沒有壓力

G. 父母親的健康與生活型態

G1. 您(寶寶母親)覺得自己**目前**的健康狀況如何？

□1 很好 □2 好 □3 普通 □4 不太好 □5 很不好

G2. **和一年前比起來**，您(寶寶母親)覺得自己現在的健康情形是比較好、差不多、還是比較差？

□1 比較好 □2 差不多 □3 比較差

G3. 您(寶寶母親)覺得您先生(寶寶父親)**目前**的健康狀況如何？

□1 很好 □2 好 □3 普通 □4 不太好 □5 很不好

G4. **和一年前比起來**，您(寶寶母親)覺得您先生(寶寶父親)現在的健康情形是比較好、差不多、還是比較差？

□1 比較好 □2 差不多 □3 比較差

G5. 您(寶寶母親)**目前**的體重多少？_____公斤，寶寶的父親**目前**體重多少？_____公斤

G6~G8. 接下來想請教有關您（寶寶母親）和寶寶父親的健康狀況和最近就醫情況。

G6~G8	a.寶寶母親			b.寶寶父親		
	0 沒有	1 有 →	請詳細說明	0 沒有	1 有 →	請詳細說明
G6. 有沒有重大傷病卡？	0	1	病名_____	0	1	病名_____
G7. 有沒有身心障礙手冊?	0	1	名稱與代號： (1)_____ (2)_____	0	1	名稱與代號： (1)_____ (2)_____
G8. **過去一年裡**有無住過院？	0	1	_____次	0	1	_____次

G9. 請問您（寶寶母親）和寶寶父親目前有沒有運動習慣，有沒有喝酒、嚼食檳榔的情形，以及每天看電視的時間大約有多久？（**運動習慣是指有規律性運動**，但平日之工作、家事等不算是運動）

生活習慣	G9a. 寶寶母親		G9b. 寶寶父親	
	0 沒有	1 有	0 沒有	1 有
1. 運動習慣	0	1	0	1
2. 喝酒	0	1	0	1
3. 吃檳榔	0	1	0	1
4. 平均每天看電視時間	約_____小時_____分鐘		約_____小時_____分鐘	

G10. 請問您（寶寶母親）是否**曾經**吸過菸？

□0 沒有吸過

□1 僅嘗試吸過幾次而已 → **【跳問 G11】**

□2 有吸過，從**以前到現在沒有**吸超過 5 包（100 支）菸

□3 有吸過，從**以前到現在有**吸超過 5 包（100 支）菸

G10a. 請問您（寶寶母親）**過去一個月內**是否有吸菸?

□1 (幾乎)每天吸 → G10a_1.平均每天吸菸 _____ 支

□2 偶爾吸 → G10a_2 平均每個月大概吸菸_____ 支

□3 已經戒菸 G10a_3.戒菸多久了? 戒了_____年_____個月

G11. 請問寶寶父親是否**曾經**吸過菸？

□0 沒有吸過

□1 僅嘗試吸過幾次而已 → **【跳問 G12】**

□2 有吸過，從**以前到現在沒有**吸超過 5 包（100 支）菸

□3 有吸過，從**以前到現在有**吸超過 5 包（100 支）菸

G11a. 請問寶寶父親**過去一個月內**是否有吸菸?

□1 (幾乎)每天吸 → G11a_1.平均每天吸菸 _____ 支

□2 偶爾吸 → G11a_2 平均每個月大概吸菸_____ 支

□3 已經戒菸 G11a_3.戒菸多久了? 戒了_____年_____個月

G13. 家裡除了寶寶的父母親以外，還有沒有人抽菸？

□0 沒有【跳問 G15】 □1 有

G13a. 包括寶寶的父母親，家裡共有幾個人抽菸？

_____ 人抽菸

G13b. 其中抽最多菸的人，每天平均抽多少菸？

□1 半包以下 □2 半包至一包 □3 一包以上

G14. 寶寶出生後，他(她) 是否每天或經常、或偶而、或完全不會吸到二手菸？

□1 每天會 □2 經常會 □3 偶而會 □4 完全不會

G15. **【訪員查核】** □1 受訪對象是寶寶母親

□2 受訪對象不是寶寶母親**【跳問 G21】**

★G16. 接下來，我會問到一些您(寶寶母親)和家人(寶寶家庭) 的相處情形，請您就實際情況來回答【「家人」是指與您住在一起的家人】。**【外籍配偶請利用翻譯卡來做答】**

	幾乎很少	**有時這樣**	**經常這樣**
1. 當您遭遇困難時，可以從家人得到滿意的幫助。	1	2	3
2. 您很滿意家人與您討論各種事情，以及分擔問題的方式。	1	2	3
3. 當您希望從事新的活動或發展時，家人都能接受且給予支持。	1	2	3
4. 您很滿意家人對您表達情感的方式，以及對您的情緒(如憤怒、悲傷、愛)的反應。	1	2	3
5. 您很滿意家人與您共度時光的方式。	1	2	3

★

G17. 您(寶寶母親) 對您目前的**婚姻關係**覺得滿不滿意？

□1 非常滿意 □3 普通 □4 不滿意
□2 滿意 □5 非常不滿意

★G18. 過去一年來，為了要照顧這個寶寶，您(寶寶母親)覺得**時間壓力**重不重？

□1 非常重 □3 普通 □4 不太有壓力
□2 有點重 □5 完全沒有壓力

★G19. 過去一年來，為了要照顧這個寶寶，您(寶寶母親)覺得**心理壓力**重不重？

□1 非常重 □3 普通 □4 不太有壓力
□2 有點重 □5 完全沒有壓力

★G20. 您(寶寶母親)覺得過去一年來照顧這個寶寶，對您的**社交生活**來說，壓力重不重？

□1 非常重 □3 普通 □4 不太有壓力
□2 有點重 □5 完全沒有壓力

G21. 除了寶寶外，您(寶寶母親)家中是否還有 **6 歲以下**的小孩需要您照顧？

□0 沒有 □1 有，還有_____個

G22. 您(寶寶母親)家裡是否有因為生病或其他健康問題，而需要**您長期(達三個月或以上)**照顧的人？

□0 沒有 □1 有，有_____人

H. 父母親童年背景

H1. 接下來，我想請教有關您（寶寶母親）和您先生（寶寶父親）的童年生活環境。首先，請問您和您先生父母親的出生年份和最高學歷是什麼？

	1.寶寶祖父	2.寶寶祖母	3.寶寶外公	4.寶寶外婆
H1a. 出生年份；或目前年齡	民國/前_____年生；或目前_____歲	民國/前_____年生；或目前_____歲	民國/前_____年生；或目前_____歲	民國/前_____年生；或目前_____歲
H1b. 教育程度	□0 未受正式教育 □1 國小 □2 國(初)中 □3 高中(職) □4 大專及以上	□0 未受正式教育 □1 國小 □2 國(初)中 □3 高中(職) □4 大專及以上	□0 未受正式教育 □1 國小 □2 國(初)中 □3 高中(職) □4 大專及以上	□0 未受正式教育 □1 國小 □2 國(初)中 □3 高中(職) □4 大專及以上

H2. 請問寶寶的祖父母和外祖父母現在的健康情形好不好？**【若已死亡，續問其死亡年份或死亡時之年齡】**

內外祖父母	目前健康情形						H2a_1~H2d_1. 死亡年份或死亡時之年齡
	1. 很好	2. 好	3. 普通	4. 不太好	5. 很不好	6. 已死亡	
H2a. 寶寶祖父	1	2	3	4	5	6	民國_____年死亡；或_____歲死亡
H2b. 寶寶祖母	1	2	3	4	5	6	民國_____年死亡；或_____歲死亡
H2c. 寶寶外公	1	2	3	4	5	6	民國_____年死亡；或_____歲死亡
H2d. 寶寶外婆	1	2	3	4	5	6	民國_____年死亡；或_____歲死亡

H3. 請問寶寶的祖父母和外祖父母是否曾有下列一些經過醫生診斷的慢性疾病？

疾病名稱	a.寶寶祖父		b.寶寶祖母		c.寶寶外公		d.寶寶外婆	
	0 沒有或不知道	1 有	0 沒有或不知道	1 有	0 沒有或不知道	1 有	0 沒有或不知道	1 有
1. 高血壓	0	1	0	1	0	1	0	1
2. 心臟病	0	1	0	1	0	1	0	1
3. 中風	0	1	0	1	0	1	0	1
4. 糖尿病	0	1	0	1	0	1	0	1
5. 氣喘	0	1	0	1	0	1	0	1
6. 過敏性鼻炎	0	1	0	1	0	1	0	1
7. 異位性皮膚炎	0	1	0	1	0	1	0	1
8. 胃潰瘍或十二指腸潰瘍	0	1	0	1	0	1	0	1
9. 肝臟疾病	0	1	0	1	0	1	0	1
10. 腎臟病	0	1	0	1	0	1	0	1
11. 甲狀腺	0	1	0	1	0	1	0	1
12. 癌症	0	1	0	1	0	1	0	1
13. 子宮卵巢疾病			0	1			0	1

H4. 您（寶寶母親）從小到生下這個寶寶以前，**大部分**的時間是住在鄉村還是都市？還是兩者約各半？

□1 大部分住鄉村　□2 大部分住都市　□3 兩者約各半

H5. 寶寶父親從小到生下這個寶寶以前，**大部分**的時間是住在鄉村還是都市？還是兩者約各半？

□1 大部分住鄉村　□2 大部分住都市　□3 兩者約各半

I.居住環境

I1. 您認為社會上大多數人都可以信任，或是對人還是小心一點比較好？

□1 多數人都可以信任 □2 一半一半 □3 還是小心一點比較好

I2. 您認為社會上一般人都願意幫助別人，還是多半只管自己的事？

□1 通常願意幫助別人 □2 一半一半 □3 多半只管自己的事

【若 B3 題寶寶父母親為已婚，以下「您們/您家」指寶寶爸爸媽媽目前住的地方；若寶寶父母親非已婚（含離婚、父親或母親過世），「您們/您家」指寶寶戶籍跟著的那位目前住的地方；若父母親均已死亡或不知去向，則指他/她大部分時間住的地方】

I3. 整體而言，您覺得您們住的這個地區，適不適合小孩子成長？

□1 非常適合 □3 普通 □4 不太適合
□2 適合 □5 非常不適合

I4. 您是否同意「居住在這個地區的人，大多數都是值得信任的」這種說法？

□1 非常同意 □3 無意見 □4 不同意
□2 同意 □5 非常不同意

I5. 您是否同意「居住在這個地區的人，大多數都願意幫助別人，而不會只管自己的事」這種說法？

□1 非常同意 □3 無意見 □4 不同意
□2 同意 □5 非常不同意

I6. 您們目前的住宅類型是：

□1 平房 □3 無電梯公寓大廈 □5 三合院
□2 透天厝 □4 電梯公寓大廈 □6 其他_____

I7. 您們現居住家的室內空間多大？總共 _____坪。

I8. 您們現居住家的室內空間規劃有幾間房間和幾套衛浴？（客廳、廚房、餐廳不算在內，但做為他用的房間例如：儲藏室、書房要算在內）：

共有_____ 間房間，全套衛浴_____間，半套衛浴_____間

I9. 請問你們目前居住的這間房子的所有權是屬於誰的？

□1 夫妻自有 □3 配住（宿舍） □4 租用
□2 親屬自有 □5 其他 (請說明)_____

I10. 整體而言，您覺得您們房子的狀況，適不適合小孩居住？

□1 非常適合 □3 普通 □4 不太適合
□2 適合 □5 非常不適合

I11. 在這個寶寶出生後，您們是否曾經搬過家（也就是住址不同於現居住家）？

□0 否【跳問 I12】 □1 是

I11a. 您們在這個寶寶出生後搬到現在這個住家，是第幾次搬家？
第_____次

I11b. 當時決定搬到現在這個住家的**最主要理由**是：

□1 屋況較佳 □5 寶寶照顧資源較豐富
□2 空間大小較適宜 □6 婚姻關係改變
□3 週邊環境（地區）較佳 □7 經濟因素
□4 本人或配偶換工作 □8 其他

I12. 這個寶寶生下後到現在這一年半期間，他(她)大部份時間是住在都市或鄉村，或兩者約各半？

□1 住鄉村 □2 住都市 □3 兩者約各半

I13. 您(寶寶媽媽/爸爸)家中是否有飼養寵物或小動物？【若有】是養什麼寵物或小動物？【可複選】

□0 沒有 □1 養狗 □3 養鴿子
□2 養貓 □4 其他【請說明】_____

I14. 您(寶寶媽媽/爸爸)家中是否有燒香拜拜的習慣？

□0 沒有 □1 每天拜 □3 每月少於一次或重要節日才拜
□2 初一、十五拜

I15. 您(寶寶媽媽/爸爸)家中有沒有鋪地毯？【若有】請問你們多久清掃地毯一次?

□0 沒有鋪設地毯 □1 每週 □3 每隔幾個月
□2 每個月 □4 每半年以上

I16. 最近半年內，您(寶寶媽媽/爸爸)家中是否曾看到蟑螂出沒？

□0 沒有 □1 幾乎每天 □3 每週 1~3 天
□2 每週 4~5 天 □4 每週少於 1 天

I17. 您(寶寶媽媽/爸爸)家中牆壁或浴室是否有出現霉菌斑(壁癌或青苔)？

□0 沒有 □1 在一面牆 □3 在三面牆
□2 在兩面牆 □4 在四面牆或以上

I18. 您(寶寶媽媽/爸爸)家中的天花板、地板、或牆壁上是否有發現「因為潮濕而造成的水漬」？

□ 0 沒有 □1 在一面牆 □3 在三面牆
□2 在兩面牆 □4 在四面牆或以上

I19. **過去半年**，您(寶寶媽媽/爸爸)家中是否曾經積水(包括陽台)？**【若有】**平均積水多久?

□0 沒有 □1 平均 1 天以內 □3 平均積水 6~10 天
□2 平均積水 2~5 天 □4 平均積水大於 10 天

J．母親懷孕與生產

J1. 請問寶寶出生的時間是在：

□1 上午：_____點 □2 下午：_____點

J2. 請問寶寶出生的時候，除了醫護人員外有沒有人**進產房在您**（寶寶生母）**身邊陪產**？

□1 沒有
□2 有 →

J2a. 請問是您的什麼人？
□1 配偶(或寶寶的父親) □3 夫家親屬
□2 娘家親屬 □4 其他

J3. 請問寶寶是您（寶寶生母）的第幾個小孩？第_____個

J4. 自從寶寶出生到現在已經過了約一年半，請問您（寶寶母親）是不是曾再懷孕(有身)過？

□1 曾 □2 不曾 **【跳問下頁】**

J4a. 您（寶寶母親）是不是又再添了小寶寶？

□1 是

J4b. 那小寶寶現在幾個月了？
現在：_____個月
【續問 J5】

□2 不是

J4c. 那您（寶寶母親）是不是現在還在懷孕中？還是已經拿掉、流產或不幸死去(打損)？

□1 現在懷孕中

J4d. 那您的預產期是什麼時候？____年____月____日
【續問 J5】

□2 拿掉(墮胎)→有幾次？_____次 **【跳問 K 節】**

□3 流掉(流產)→有幾次？_____次 **【跳問 K 節】**

□4 死產→有幾次？_____次 **【跳問 K 節】**

J5. 您（寶寶母親）說您們又添了寶寶/您現在又再懷孕，請問這是您原本預期要有的還是意外的懷孕？

□1 預期有的 □2 意外的 □3 順其自然

【訪員查核】寶寶母親原始國籍是否為外籍或大陸配偶

□1 為本國籍【跳問 L 節】

K. 外籍及大陸配偶涵化

甲、 基本資料

K1. 請問在台灣，您是否有來自(受訪者來自之國家)的親戚或朋友？

□0 沒有 □1 有

K2. 請問您在台灣多常和住在故鄉的親戚朋友聯絡？

□1 至少一週一次 □3 至少半年一次

□2 至少一個月一次 □4 至少一年一次

K3. 請問您在台灣接受過幾年的教育？ _____年

K4. 請問您到台灣後到現在，有沒有參加過什麼樣的教育班或輔導班？

□0 沒有【跳問 K5】 □1 有

K4a. 請問是什麼班別？【可複選】

□1 生活適應輔導班 □4 外籍配偶識字班

□2 成人基本教育研習班(簡稱成教班) □5 其他【請說明】

□3 國小補校 _____

乙、涵化程度（空白部份請訪員說出受訪者來自之國家名稱）

K5. 請問您**聽**國語的能力：

□1 很好 □3 普通，不好不差 □4 差/不好
□2 好 □5 很差

K6. 請問您**說**國語的能力：

□1 很好 □3 普通，不好不差 □4 差/不好
□2 好 □5 很差

K7. 請問您**讀**國語的能力：

□1 很好 □3 普通，不好不差 □4 差/不好
□2 好 □5 很差

K8. 請問您**寫**國語的能力：

□1 很好 □3 普通，不好不差 □4 差/不好
□2 好 □5 很差

K9. 請問您**聽**台語的能力：

□1 很好 □3 普通，不好不差 □4 差/不好
□2 好 □5 很差

K10. 請問您**說**台語的能力：

□1 很好 □3 普通，不好不差 □4 差/不好
□2 好 □5 很差

K11. 請問您在台灣居住的地區，大多數民眾使用什麼語言交談？

□1 國語 □2 台語 □3 客家語 □4 其他【請註明】_____

K12. 在台灣，您平常使用什麼語言與人交談？

□1 全是_____的 □4 多數是本地的
□2 多數是_____的 □5 全是本地的
□3 一半是_____的，一半是本地的 □6 台灣本地人交談語言和家鄉使用語言相同

K13. 在台灣，您較喜歡使用什麼語言與人交談？

□1 全是_____的 □4 多數是本地的
□2 多數是_____的 □5 全是本地的
□3 一半是_____的，一半是本地的 □6 台灣本地人交談語言和在台灣使用語言相同

K14. 您平常吃哪種食物？

□1 全是_____食物 □3 一半_____食物，一半本地食物 □4 多數是本地食物
□2 多數是_____食物 □5 全是本地食物

K15. 您比較喜歡吃哪種食物?

□1 全是_____食物 □3 一半_____食物，一半本地食物 □4 多數是本地食物
□2 多數是_____食物 □5 全是本地食物

K16. 您平常和哪些人交往？

□1 全是_____人 □3 一半_____人，一半本地人 □4 多數是本地人
□2 多數是_____人 □5 全是本地人

K17. 通常您遇到困難時（如生活適應、情緒低落、經濟困難等）會找誰幫忙？

□1 全是_____人 □3 一半_____人，一半本地人 □4 多數是本地人
□2 多數是_____人 □5 全是本地人

K18. 您帶小孩的方式？

□1.全是_____方式 □3.一半_____方式，一半本地方式 □5.全是本地方式
□2.多數是_____方式 □4.多數是本地方式 □6.兩地無太大差異

K19. 您帶小孩有疑問時，您通常會先向誰請教？

□1 婆家親友 □4 台灣的醫護人員
□2 住在故鄉的親友 □5 沒有人可以請教
□3 住在台灣但來自家鄉的親友 □6 其他【請註明】_____

K20. 您認為自己是：□1 _____人 □2 台灣人 □3 也是_____人，也是台灣人

K21. 過去一年您在帶孩子時，有沒有面臨哪些有關帶小孩的問題？

□0 沒有 □1 有

K21a. 是什麼問題？【可複選】

□1 寶寶飲食習慣/問題 □4 擔心自己經驗不足
□2 寶寶健康狀況 □5 其他【請註明】_____

L．幼兒居家安全簡要檢核表

【由訪員觀察填答】

說明：以下幼兒居家安全簡要檢核表—**僅以客廳為範圍**，由**訪員觀察填答**，若**訪談地點非寶寶大部分居住的家中，則詢問受訪者後填答。**各項內容**只要有部分符合就圈「是」。**

檢核項目	否	是
L1.**客廳裡**，地面屬堅硬光滑材質（如：大理石、磁磚等），未鋪軟質地毯或地墊。	0	1
L2.**客廳裡**，家具邊緣（如：沙發、桌、椅、矮櫃等）有尖而硬的凸角或邊緣。	0	1
L3.**客廳裡**，有小電池、針、釦子、玻璃珠、小髮夾、硬幣、瓶蓋等小物品放在幼兒能拿到的地方。【指約大人腰部以下的地】	0	1
L4.**客廳裡**，有剪刀、指甲刀、刮鬍刀等尖、利物品或工具（如：起子、釘子、鋸子、打火機、火柴等）放在幼兒能拿到的地方。 【指約大人腰部以下的地方】	0	1
L5.**客廳裡**，有藥品、化妝品、清潔劑或殺蟲劑放在幼兒能拿到的地方。【指約大人腰部以下的地方】	0	1
L6.**客廳裡**，窗簾的拉繩垂落至幼兒能抓到的地方，或有細繩、塑膠袋等放在幼兒能拿到的地方。【指約大人腰部以下的地方】	0	1
L7.**客廳裡**，未使用的電插座沒有加防護蓋；或開飲機、飲茶爐具等放在幼兒能碰觸的地方。【指約大人腰部以下的地方】	0	1

L8. 本題組為：□1. 訪員觀察後填答　　□2. 詢問受訪者後填答

問卷到此結束，謝謝您的合作。謝謝！

訪視結束時間：□1.上午　□2.下午　_____時_____分（採 24 小時制）

Z．訪問記實及受訪者簽名

Z1. 本問卷完成時間：

起：_____時_____分；

迄：_____時_____分，共計_____分鐘。

特殊註記：_____

Z2. 領取紀念品之品名：

□1 便利商店現金禮卷 200 元

□2 其他(請說明) ：_____

有關上列所記錄之訪問時間，及已領取紀念品品名等均與事實一致。

受訪者簽名、蓋章或蓋手印_____

Y.訪員觀察及訪問過程狀況記錄

Y1. 與受訪者面談之地點:

□1 戶籍地 □2 現住地 □3 工作地點 □4 其他【**請寫出**】: _____

Y2. 訪問受訪者的過程中，是不是有其他人在場？

□1. 有，大部分時間都在場 □3. 有，偶而在場

□2. 有，約有一半的時間在場 □4. 沒有他人在場【**跳問 Y3**】

Y2a. 【如果有他人在場】他們是小朋友的什麼人？

_____

Y2b. 在場的其他人是不是有影響受訪者作答的情形？如何影響？

□1 有造成干擾 □3 在旁注意聽，但沒有加入回答

□2 有幫受訪者回答或改正答案 □4 沒有影響

Y2c. 受訪者會不會因為有人在場而無法專心作答？

□1. 一直受到影響 □3. 一點點影響

□2. 有些影響 □4. 不受影響

Y3. 與受訪者交談所用語言【**可複選**】

□a.國語 □b.台語 □c.客家語 □d.其他【**請寫出**】: _____

Y4. 受訪者瞭解問題的情形怎麼樣？□1.很好 □2.好 □3.尚可 □4.很差

Y5. 受訪者合作程度 □1.很合作 □2.普通 □3. 很不合作

Y6. 受訪者回答可靠程度

□1.全部可靠 □2.大部分可靠 □3.部分可靠 □4.大部分不可靠

【**跳問 Y7**】

Y6a. 何題不可靠？(若整頁或整節不可靠，則填頁數或節名)

_____

Y7. 有沒有完成六個月大調查時的需求評估與服務轉介同意書的簽署？

□1.有 □2.沒有 □3.不需要

Y8. 請寫出有關訪問過程、受訪者反應、或其他特殊狀況、問題：

_____

Y9. 寫下有助於再訪時找到該戶(該受訪者)之記述或圖示：

幼兒健康照護需求評估與接受轉介服務意願

說明：為即時提供參與本調查個案健康照護配套服務措施，

請訪員查核本問卷嬰兒健康相關資料，填寫以下各題

，以評估其是否須轉介予相關醫療或社會福利單位。

鄉鎮區代碼				序列號		

幼兒姓名：_____ 性別：□1 男 □2 女

幼兒母親(主要照顧者)姓名：_____ 電話：(　)_____

幼兒母親(主要照顧者)住址：

地址	_____縣市_____鄉鎮市區_____村里_____路街 _____段_____巷_____弄_____號_____樓

寶寶健康狀況：

M1. 體重：男生＜6.73 公斤、女生＜6.37 公斤（第 2 頁 A1_3） □

M2. 發展里程碑：第 1, 3, 5 及 7 項有**任何一項**勾選「還不會」(第 4 頁 A5) □

M3.【訪員查核】：M1 及 M2 至少有一項打勾 □

家庭狀況【以寶寶父母親狀況為主】：

N1. 雙親目前為非已婚狀態（離婚、死亡、不知去向等）(第 6 頁 B3) □

N2. 雙親目前皆無全職工作(第 19 頁 F5、第 20 頁 F9) □

N3. 雙親皆無任何社會保險（第 19 頁 F3-F4，第 20 頁 F7-F8） □

N4. 自覺育兒經濟壓力「非常重」(第 21 頁 F12) □

N5. 父、母親至少有一個有重大傷病(第 22 頁 G6a 及 G6b) □

N6. 家庭功能量表分數為 0 (第 24 頁 G16) □

N7.【訪員查核】：N1-N6 勾選兩項以上（≧2） □

N8. 幼兒母親(主要照顧者)是否同意國民健康局將寶寶的照顧情形資料轉介給當地的社會福利或醫療相關單位，請他們提供進一步的服務或幫助？

□1 同意**【附轉介同意書】** □2 不需要/不同意

N9. 訪員姓名：_____ 填報時間：民國____年____月____日

【由國民健康局填寫】　　轉介狀況：轉介至_____單位

【註一】：採用寶寶 15 個月未滿 18 個月大時的體重測量；此處之「體重不足」指寶寶體重低於平均值減 3 個標準差的值，男、女生標準分開計算。

【註二】：發展里程碑是測量寶寶通過 12 個月大發展里程碑的狀況。

【註三】：無全職工作：沒有工作，或每週工作低於 35 小時者均算。

【註四】：社會保險指公保、農保、勞保、軍保、福保、漁保或全民健保任一。

P .特殊家庭註記（若無特殊註記則不須填寫）

P1.特殊家庭註記：【可複選】

□ 1. 父母感情瀕臨破裂分居中，或父母訴訟離婚中
□ 2. 父不詳或性侵生子　□3. 未婚生子
□ 4. 父親與她人同居　□5. 母親與他人同居
□ 6. 父親不知去向　□7. 母親不知去向
□ 8. 父親入獄服刑中　□9. 母親入獄服刑中
□ 10. 母親不願多談嬰兒生父　□11. 父親過世
□ 12. 家人不願多談嬰兒生母　□13. 母親過世
□ 14. 嬰兒由人領養
□ 15. 嬰兒父親精神疾病或心智不正常
□ 16. 嬰兒母親精神疾病或心智不正常
□ 17. 嬰兒或父、母親為兩岸或國內、外居住者【續填 P2 寶寶居住狀況】
□ 18. 其他(請說明)_____

【上述狀況補充說明】

→寶寶居住狀況

P2. 目前(訪問當時)寶寶住在哪裡？
□1. 台灣地區　□2. 其他國家或地區(請說明)_____

P3. 過去六個月，寶寶的居住情形是哪一種？
□1. 寶寶全都住在台灣

□2. 大部分時間住在台灣（累計時間超過三個月），

少部分時間住在_____（國家或地區名稱）

□3. 少部分時間住在台灣（累計時間低於三個月），

大部分時間住在_____（國家或地區名稱）

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1-2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5-6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	NA
Study size	10	Explain how the study size was arrived at	7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7-8
		(*b*) Describe any methods used to examine subgroups and interactions	8-9
		(*c*) Explain how missing data were addressed	23
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	5-6
		(*e*) Describe any sensitivity analyses	NA

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	10
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	23-24
		(b) Indicate number of participants with missing data for each variable of interest	23-24
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	NA
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	NA
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	10-12
		Cross-sectional study—Report numbers of outcome events or summary measures	NA
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	25
		(*b*) Report category boundaries when continuous variables were categorized	7-8
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives	12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	15
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13-15
Generalisability	21	Discuss the generalisability (external validity) of the study results	5
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	16

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.