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Sociodemographic factors associated with secondhand smoke exposure and smoking rules in homes with children

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Background: This study aims to identify sociodemographic characteristics associated with secondhand smoke (SHS) exposure and the adoption of smoking bans in homes with children in Spain **Methods:** We performed, in 2016, a cross-sectional study to a representative sample of Spanish households with children under 12 years old. We administered a telephone survey to the parents asking about smoking patterns at home, children's SHS exposure and sociodemographic characteristics. Poisson regression models with robust variance were built to assess sociodemographic characteristics associated with household SHS exposure and the adoption of smoking rules. **Results:** In this study participated 2411 families, 25.8% of which reported exposure at home and 84.4% implemented smoking bans. SHS exposure was associated with having one (aPR = 2.09; 95% CI: 1.43–3.04) or two Spanish parents (aPR = 1.71; 95% CI: 1.24–2.36), lower educational attainment (primary: aPR = 1.74; 95% CI: 1.45–2.10; secondary: aPR = 1.37; 95% CI: 1.17–1.60 compared with university studies), a family structure different from two-parent family (aPR = 1.38; 95% CI: 1.14–1.67) and parents between 31 and 40 years (aPR = 0.75; 95% CI: 0.57–0.99) and 41–50 years (aPR = 0.62; 95% CI: 0.47–0.81) compared with 18- to 30-year-old parents. The adoption of smoking bans was associated with two-parent family (aPR = 1.09; 95% CI: 1.01–1.17), living with non-smokers (aPR = 1.46; 95% CI: 1.31–1.62), parents of foreign origin (aPR = 1.09; 95% CI: 1.04–1.14) and younger children (0–3 years: aPR = 1.05; 95% CI: 1.01–1.09) compared with the oldest children (8–11 years). **Conclusions:** The parent's origin and the family structure were associated with SHS exposure and the adoption of smoking bans at home. Moreover, the number of smokers living at home was relevant for the adoption of smoking bans, and the educational attainment for SHS exposure. These factors should be taken into consideration when designing or implementing smoke-free home programmes.

Introduction

Secondhand smoke (SHS) is composed of >4000 substances, some of which are pathogenic.[1] Children's respiratory and immune systems are still developing and their breathing rate is faster than that of adults. Therefore, their SHS intake is also higher in proportion to their body size. SHS exposure in children has been associated with illnesses such as middle ear disease, lower respiratory illnesses, respiratory symptoms and sudden infant death syndrome.[1]

In 2006, Spain introduced a smoking law aiming to regulate tobacco use and SHS exposure.[2] In 2011 the law was updated, increasing the indoor public settings where smoking was banned, and it also recognized children as a vulnerable population.[3] Consequently, the rules regarding places usually attended by children were reinforced, e.g. outdoor areas in playgrounds and schools. Studies evaluating the impact of these laws reported a reduction in SHS exposure in many of the settings within their influence.[4–6]

It has been estimated that in Europe 51% of children are exposed to SHS.[7] In Spain, despite the positive impact of the laws, three out of four children are still exposed to SHS, and one in four is exposed at home.[8] Few studies have assessed smoking rules introduced at home, and one conducted in Barcelona showed that in 2013–14, 72.0% of households with underage children forbid smoking.[9] This prevalence is relevant because airborne nicotine concentrations in homes with smokers can reach levels as high as those observed in workplaces before the introduction of the smoke-free laws.[10]

SHS exposure in homes has been associated with the smoking habits of the residents. For instance, a higher frequency and intensity of SHS exposure are more likely in families with a higher number of smokers and in families without smoking bans.[10,11] Socioeconomic indicators are commonly included in studies

assessing inequalities in SHS exposure and various studies agree that more deprived families are more likely to be exposed to SHS and are less likely to adopt smoking bans than more affluent families.[12] There is a wide range of sociodemographic factors that could be of interest when assessing SHS exposure or the adoption of smoking bans at home. For instance, in studies conducted in Europe, the likelihood of being exposed was higher among single mothers (compared with married mothers) and in more crowded households.[13–15]

Although some studies have included sociodemographic factors, few of them have studied a wide range of them, especially among children. Moreover, as far as we know, none of the studies assessing the association between sociodemographic indicators and SHS exposure in homes with children have been performed in a representative sample of population. Therefore, the objectives of this study were to describe SHS exposure patterns in homes with children under 12 years of age in Spain, and to identify sociodemographic factors associated with SHS exposure and the adoption of smoking bans in these homes.

Methods

Study population and recruitment

This is a cross-sectional study with a representative sample of families with children under 12 years of age of Spain.

We estimated a sample of 2411 families that were selected randomly by their telephone number. Families agreeing to participate and having at least one child under 12 years of age participated in the study. To achieve representativeness, quotas of age and sex of the youngest child at home by Autonomous Community in Spain were filled.

Information source

We designed a questionnaire to assess SHS exposure among children based on previous questionnaires addressed to adults. The questionnaire was piloted in a small sample and the questions were adjusted when necessary. The final questionnaire was administered by telephone between September and November 2016 to the father, mother or guardian of the child. It included questions regarding their smoking habits at home and the sociodemographic characteristics of the family.

Ethical considerations

At the end of the questionnaire, the interviewer informed the participants that all information provided was confidential and that it would be used according to the Spanish law for data protection. In addition, the participants were informed that they could withdraw from the study whenever they wished. This study was assessed by the Parc de Salut Mar Ethics Committee and was approved under code 2015/6501/I.

Study variables

The questionnaire included the questions 'Do you usually smoke inside the home?' and 'Do you usually smoke in outdoor places such as terraces, balconies, galleries, gardens, etc.?' directed at each resident older than 12 years of age. We pooled the answers together to create the variable 'places where people usually smoke at home', the possible categories being nowhere, only outdoors (not smoking inside the home) and inside (independently from smoking outdoors) when at least one household resident reported smoking in these places. Exposure at home was defined as the presence of at least one resident usually smoking inside or outdoors.

Participants were also asked about rules introduced inside home (not allowed anywhere, only allowed in certain rooms, allowed in occasional situations, allowed anytime) and outdoors (allowed, only in occasional situations, not allowed). We created the variable smoking rules with the categories 'full ban' (smoking forbidden inside and outdoors), 'partial ban' (smoking forbidden only inside) and 'no ban' (smoking allowed anywhere). In addition, when participants reported that smoking was allowed inside the home we asked about the rooms where smoking was allowed.

We recorded the smoking habits of each resident older than 12 years of age living at home, which included smoking status and the number of cigarettes smoked weekly. We then calculated the number of smokers living in the home. The variable 'guest that smoked the week before' (with the categories nowhere, outside or inside) was created on the same basis as 'places where people usually smoke at home' using the questions in the questionnaire 'Besides the family members, has anyone smoked inside the home in the last week?' and 'and in outdoors places such as terraces and balconies?' We also asked about the mean number of hours per day that someone had smoked inside the home in the last week on a working day and on a non-working day and we also asked the same questions but in the presence of the child. We computed the answers together to obtain the mean minutes of SHS exposure per week in the presence and in the absence of the child.

Sociodemographic information about all home residents was elicited: sex, age and the family-relationship of each resident with the youngest child at home (mother, father, brother, grandparent or other). We then calculated the number of family members and children under 12 years of age living in the home, the sex of children living in the home (only boys, only girls or boys and girls) and the family structure (two-parent family or other structures). Finally, the questionnaire asked about the country of origin of the parents, which was categorized as '2 from Spain (or 1 single-parent from Spain)', '1 Spanish and 1 foreign' and '2 foreign (or 1 foreign single-parent)'.

The socioeconomic variables assessed were the educational level (primary school or less, secondary school or university education).

Data analysis

We described all the sample characteristics and we assessed all smoking patterns of the household stratifying them by the reported SHS exposure at home and applying the chi-squared test to assess for prevalence differences. In addition, we described the intensity of SHS exposure among exposed households in terms of 'number of smokers living in the home', 'number of usual smokers in the home' and 'minutes per day that someone has smoked inside the home' in the presence and in the absence of the children. We also assessed the sociodemographic factors related to SHS exposure in the home and to the introduction of smoking rules at home (full ban or partial ban vs. no ban). For that, we calculated adjusted prevalence ratios (aPRs) between these two outcomes and the explanatory variables by fitting multivariate Poisson regression models with robust variance and their 95% confidence intervals. The significance level was set at 5% for all the analysis.

Results

A total of 2411 families with children under 12 years of age living at home took part in the study; 60.7% of them had 1 child. Regarding the survey respondents, 61.8% were men, the mean age was 42.4 years, 82.9% were non-smokers and 44.1% of the main family earners had university education (table 1).

Table 2 shows that 25.8% of the households were exposed to SHS at home (either inside or outside the home) and 61.1% of the families had a partial smoking ban. Moreover, there were no smoking rules in the home in 35.5% of the exposed households and in 8.6% among non-exposed households. In homes without bans, the rooms where smoking was allowed were the living room, kitchen or a combination of both.

Table 1 Characteristics of the sample

	n = 2411	%
Survey respondents' characteristics		
Age (mean and 95% CI)	42.4	42.01–42.72
Sex		
Female	1490	61.8
Male	921	38.2
Origin		
Spain	2111	87.6
Other	300	12.4
Smoking status		
Smoker	413	17.1
Non-smoker	1998	82.9
Number of cigarettes smoked weekly if smoker (*n* = 408)[a]		
From 1 to 20	70	17.2
From 21 to 40	78	19.1
From 41 to 60	47	11.5
From 61 to 80	82	20.1
>80 cigarettes	131	32.1
Children's characteristics		
Youngest child's age		
0–3	736	30.5
4–7	804	33.4
8–11	871	36.1
Children's sex		
Only girl/s	938	38.9
Only boy/s	989	41.0
Boys and girls	484	20.1
Sociodemographic characteristics of the family		
Number of family members		
2	50	2.1
3	731	30.3
4	1172	48.6
≥5	458	19.0
Number of children		
1	1464	60.7
2	825	34.2
≥3	122	5.1
Family structure		
Two-parents	2166	89.8
Other[a]	245	10.2
Parents' origin		
2 from Spain (or 1 Spanish single-parent)	2035	84.4
1 Spanish and 1 foreigner	182	7.5
2 foreign (1 foreign single-parent)	194	8.1
Main earner's education		
Primary	357	14.9
Secondary	985	41.0
University	1060	44.1
Employment status		
Working	2166	89.8
Not working	245	10.2

Note: Spain 2016.
Note: Missing values <5%.
a: The category 'other' refers to kinds of families different from 'two-parent'.

Among households reporting SHS exposure, 65.1% had only one smoker and 67.0% had one smoker who usually smoked at home (either inside or outdoors). Regarding the time of exposure, 48.3% of the exposed families reported smoking inside the home between 1 and 60 min, but when children were with them, half of them reported not smoking (figure 1).

After adjusting for all sociodemographic factors, the results showed that families were more likely to report SHS exposure when they were not two-parent families (aPR = 1.38; 95% CI 1.14–1.67), when the main earner had secondary or primary school education (aPR = 1.37; 95% CI 1.17–1.60 and aPR = 1.74; 95% CI 1.45–2.10, respectively), and when one parent or both were of Spanish origin (aPR = 2.09; 95% CI 1.43–3.04 and aPR = 1.71; 95% CI 1.24–2.36, respectively). In contrast, parents aged between 31 and 40 years and between 41 and 50 years (aPR = 0.75; 95% CI 0.57–0.99 and aPR = 0.62; 95% CI 0.47–0.81, respectively) were less likely to report SHS exposure than younger parents. Likewise, smoking bans were more likely to be introduced when parents were foreigners (aPR = 1.09; 95% CI 1.05–1.14), when no smokers lived in the home (aPR = 1.49; 95% CI 1.34–1.66) or only one (aPR = 1.15; 95% CI 1.02–1.29), when children were aged between 0 and 3 years old (aPR = 1.06; 95% CI 1.02–1.10) and when the family was a two-parent family (aPR = 1.09; 95% CI 1.01–1.16) (table 3). In addition, the sex of the survey respondent was analyzed for both models, but no association was found.

Discussion

The results of this study show that smoking takes place mostly in outdoor settings and that most households adopt partial smoking bans (smoking is forbidden only inside). SHS exposure at home is associated with the family structure, the parents' origins, the age of the survey respondent and the educational attainment of the main earner. The adoption of smoking rules is associated with the family structure, the parent's origin, the age of the youngest child and the number of smokers living in the home.

Families with children are more likely to implement smoking bans in the home,[9,16] and therefore, a coherent finding was that >80% of all the participant families had smoking restrictions at home, 91.3% among non-exposed families and 64.5% among exposed families. Furthermore, non-smokers perceive the health risks of SHS exposure more than smokers,[17] and it has also been reported that people with a higher perception of the harmful effects of SHS are more likely to adopt smoking bans at home.[9] Our results show that non-exposed households did not have smoker' resident, which could explain the differences found between exposed and non-exposed households in the adoption of smoking bans at home. In addition, we observed that 15.6% of the families did not implement any kind of smoking ban at home, allowing people to smoke inside the home. This is worrisome because a study conducted in families with children in Spain reported a high intensity of SHS exposure, in terms of nicotine concentrations, when no smoking rule was adopted in the home.[10]

Among families allowing smoking inside the home, the kitchen and living room were the rooms where smoking was usually allowed, without difference between exposed and non-exposed families. Living rooms play a social role, since it is the main room in the home where family members spend time together and display their habits.[18] Therefore, in the absence of smoking rules, it is usual to find residents smoking there.[16] Furthermore, guests also share this space when they are invited inside, and they might be allowed to smoke since smoking rules tend to be relaxed out of politeness.[16] Regarding kitchens, families might perceive that the harm of smoking there is lower or at least not increased by SHS, perhaps because it is a place where other types of smoke are generated and most kitchens are equipped with exhaust hoods. Nevertheless, the effect of exhaust hoods is not large enough to completely eliminate all the pollutants.[19,20] Overall, restricting smoking in one room is not an effective measure to control SHS exposure, since smoke can drift through the house and can contaminate other rooms where smoking did not occur.[10,21]

Families reporting SHS exposure at home were asked about the minutes per day they smoked inside home and if they also smoked when they were with their offspring. Nearly half of the families smoked between 1 and 60 min inside the home, but half of them reported not smoking at all when their children were with them. This is especially important because they might recognize children as a vulnerable population and might be trying to avoid exposing them to SHS. This action might help to reduce the intensity of the

Table 2 Smoking patterns according to SHS exposure[a] at home

	Home exposure				*P*-value[b]	Total	
	Not exposed		Exposed				
	n	%	*n*	%		*n*	%
Number of smokers living in the home					<0.001		
0	1709	95.5	0	0		1709	70.9
1	72	4.0	405	65.1		477	19.8
2	8	0.5	197	31.7		205	8.5
≥3	0	0	20	3.2		20	0.8
Place where people usually smoke in the home					<0.001		
Inside	0	0	183	29.4		183	7.6
Outdoors	0	0	439	70.6		439	18.2
Nowhere	1789	100	0	0		1789	74.2
Smoking rules					<0.001		
No rules	154	8.6	221	35.5		375	15.6
Partial ban (only banned inside)	1084	60.6	390	62.7		1474	61.1
Full ban (not allowed anywhere)	551	30.8	11	1.8		562	23.3
Rooms where smoking is allowed (*n* = 375)[c]					0.163		
Living room	35	23.3	28	12.7		63	17.0
Kitchen	73	48.7	118	53.6		191	51.6
Kitchen and living room	13	8.7	26	11.8		39	10.6
Kitchen and others	3	2.0	3	1.4		6	1.6
Others	14	9.3	23	10.5		37	10.0
Three or more rooms	12	8.0	22	10.0		34	9.2
Guest smoking in the previous week					<0.001		
Inside	24	1.3	51	8.3		75	3.1
Outside	180	10.1	212	34.3		392	16.4
Nowhere	1577	88.6	354	57.4		1931	80.5
Relationship of the smoker with the child[d] (*n* = 702)					0.002		
Mother	26	32.5	176	28.3		202	28.8
Father	38	47.5	242	38.9		280	39.9
Both	7	8.8	170	27.3		177	25.2
Other	9	11.3	34	5.5		43	6.1

Note: Spain 2016.
Note: Missing data were <5%.
a: SHS exposure in the home was defined as people usually smoking either inside or outdoors.
b: Chi-square test at the 95% confidence level.
c: Among houses where there was no smoking ban (*n* = 375).
d: Among homes with smokers (*n* = 702).

children's exposure but does not completely protect them from SHS.[21]

In this study, families with Spanish parents were more likely to report SHS exposure at home and not to implement smoking bans at home compared with families with parents from other countries. Our results are in line with those of another study conducted in Spain that assessed SHS exposure among pregnant women, which reported that migrant women were less exposed to SHS than Spanish women.[22] Other studies, however, found different results showing that in the USA and Germany migrant parents tended to be more exposed than native parents.[23,24] As Oberg et al.[7] showed, the prevalence of SHS exposure differs in each world region, Europe being the most exposed, and SHS exposure at home among the migrant population might depend on their country of origin. The family structure was also associated with the adoption of smoking bans and SHS exposure at home, showing that two-parent family were more likely not to report SHS exposure and to adopt smoking bans at home than other types of families. Similar results have been found by other authors.[14,25–27]

Our results show that parents aged from 31 to 50 years were less likely to report SHS exposure than younger parents. Different studies assessing SHS exposure among adults have reported that SHS exposure is more likely in younger adults.[23,28] In addition, in a study conducted among pregnant woman, SHS exposure was also more likely to be reported by women younger than 25 years old than in older women. In our study, however, the adoption of smoking rules at home was associated with the children's rather than the parents' age. Families with children aged from 0 to 3 years were more likely to adopt smoking bans, results that are in agreement with those of other studies.[27,29] It is known that parents have an increased risk perception regarding the effects of SHS exposure when their children are young, and therefore they tend to implement smoking bans at home. This perception is reduced when the children become older.[16]

Inequalities in SHS exposure at home have been widely reported,[14,30,31] and our study is no exception since the results showed that families whose main earner had primary and secondary education were much more likely to report SHS exposure than families with a main earner with university education.

Most of the studies assessing the number of smokers living at home used it as a proxy of the intensity of SHS exposure, showing higher exposure when more smokers lived in the home.[10,11] In this study, we found that the number of smokers living in the home was also a relevant factor in the adoption of smoking bans at home. Family members can potentially influence each other by decreasing the likelihood of implementing smoking bans when the number of smokers at home is higher.[16]

This study shows the usual limitations of questionnaire-based studies. All the information was reported by the participants, and therefore information, desirability and memory bias might apply. However, participation was voluntary and the recall time was short, which would minimize the risk of bias. Another limitation is that the questionnaire used was not validated. However, it was designed by using a previously used questionnaire addressed to

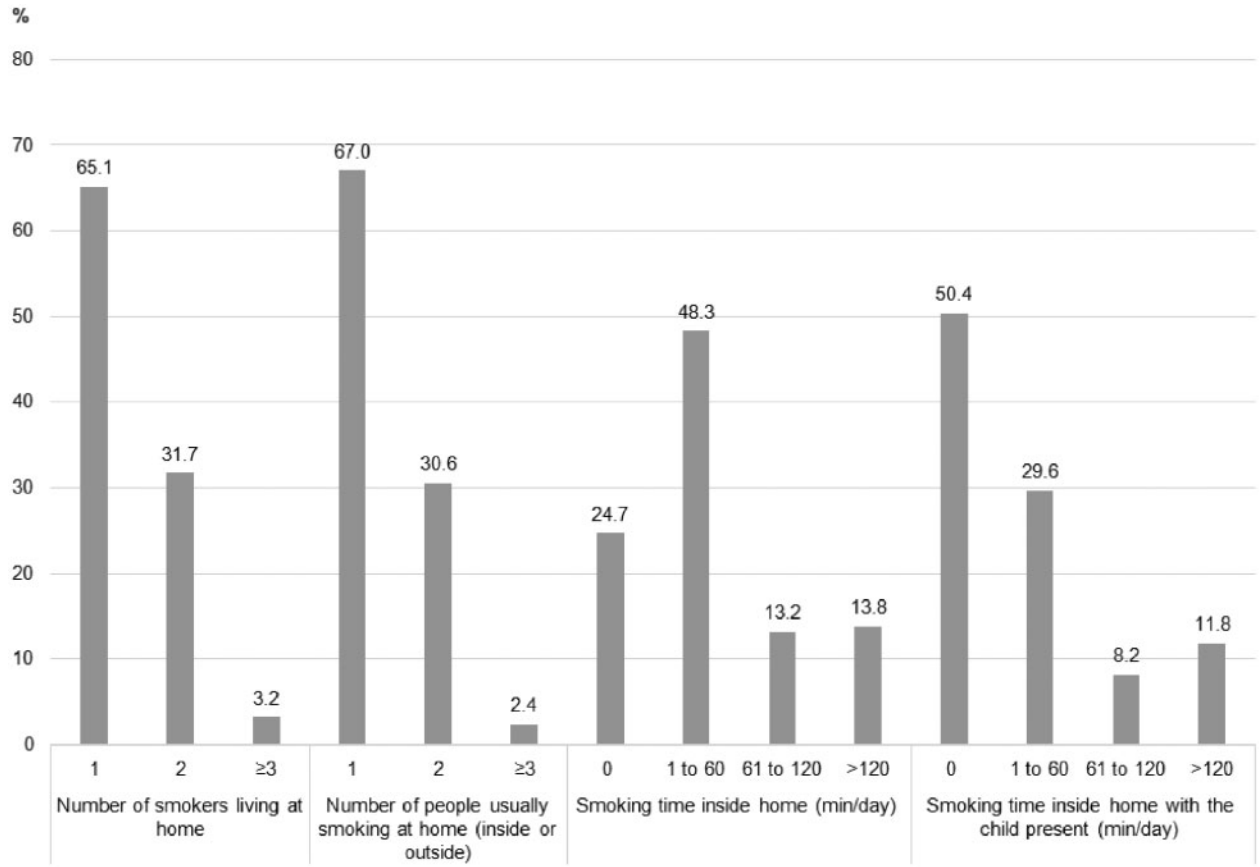

Figure 1 Number of smokers and minutes per day among households that reported SHS exposure. Spain 2016

Table 3 Sociodemographic factors associated with the reported SHS exposed households and the adoption of smoking rules at home

	SHS exposed households[a]		Adoption of smoke-free rules[b]	
	n(%)	aPR (95% CI)	*n*(%)	aPR (95% CI)
Age survey respondent				
18–30	37 (39.8)		74 (79.6)	
31–40	217 (26.8)	0.75 (0.57–0.99)	694 (85.7)	
41–50	272 (22.4)	0.62 (0.47–0.81)	1024 (84.4)	
≥51	94 (32.3)	0.78 (0.60–1.10)	242 (83.2)	
Youngest child's age (years)				
0–3	188 (25.5)		643 (87.4)	1.05 (1.01–1.09)
4–7	198 (24.6)		681 (84.7)	1.02 (0.98–1.06)
8–11	236 (27.1)		712 (81.8)	
Studies main earner				
University	212 (20.0)		920 (86.8)	
Secondary	274 (27.8)	1.37 (1.17–1.60)	824 (83.7)	
Primary or less	135 (37.8)	1.74 (1.45–2.10)	284 (79.6)	
Family structure				
Two-parents	531 (24.5)		1851 (85.5)	1.09 (1.01–1.17)
Other[c]	91 (37.1)	1.38 (1.14–1.67)	185 (75.5)	
Parent's origin				
2 from Spain (or 1 Spanish single-parent)	529 (26.0)	1.71 (1.24–2.36)	1705 (83.8)	
1 Spanish and 1 foreigner	59 (32.4)	2.09 (1.43–3.05)	150 (82.4)	1.00 (0.93–1.07)
2 foreigners (or 1 foreigner single-parent)	34 (17.5)		181 (93.3)	1.09 (1.04–1.14)
Number of smokers living at home				
0	0 (0.0)		1566 (91.6)	1.46 (1.31–1.62)
1	405 (84.9)		333 (69.8)	1.12 (0.99–1.26)
≥2	217 (96.4)		137 (60.9)	

Note: Spain 2016.
aPR, adjusted prevalence ratio.
a: SHS exposed households where smoking occurred indoors and/or outdoors (*n* = 622).
b: Considering full and partial ban (smoking not allowed inside) vs. no smoking ban (smoking allowed anywhere).
c: The category 'other' refers to kinds of families different from 'two-parent'.

adults, which was adapted to families with children and piloted. In addition, assessment of the validity of the SHS exposure indicators showed good results.[32] As far as we know, this is the first study assessing sociodemographic factors in a national representative sample of families with children in Europe. In addition, we have included a wide range of sociodemographic factors and assessed their association with two different main outcomes: SHS exposure in the home and the adoption of smoking rules in the home, providing a comprehensive view of the SHS exposure of children at home.

Smoking still takes place within the home boundaries generating an unhealthy environment for children. To successfully avoid SHS exposure and achieve smoke-free homes, there is perhaps a need to better explain to families how SHS exposure takes place,[17] and interventions should target factors such as people's beliefs (i.e. that smoking on terraces or balconies is safe) and social norms (allowing guests to smoke in the home).[16] In addition, we have identified sociodemographic factors including educational level, family structure and the migrant background of the parents that play a key role in home SHS exposure and in the adoption of smoking bans at home. They should be taken into consideration in the design and implementation of programmes aiming to promote smoke-free homes.

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Conflicts of interest: None declared.

Key points

- Most households adopted a smoking rule at home.
- The family structure and the parent's origin are associated with the SHS exposure and the smoking rules at home.
- The educational level of the parents is associated with the children's SHS exposure at home.
- The number of smokers living at home is important for the implementation of smoking bans.

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Inequity in postpartum healthcare provision at home and its association with subsequent healthcare expenditure

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Background: Provision of postpartum care can support new families in adapting to a new situation. We aimed to determine whether various determinants of socioeconomic status (SES) were associated with utilization of postpartum care. In addition, to stress the relevance of increasing postpartum care uptake among low SES-groups, an assessment of the potential (cost-)effectiveness of postpartum care is required. **Methods:** National retrospective cohort study using linked routinely collected healthcare data from all registered singleton deliveries (2010–13) in the Netherlands. Small-for-gestational age and preterm babies were excluded. The associations between SES and postpartum care uptake, and between uptake and health care expenditure were studied using multivariable regression analyses. **Results:** Of all 569 921 deliveries included, 1.2% did not receive postpartum care. Among women who did receive care, care duration was below the recommended minimum of 24 h in 15.3%. All indicators of low SES were independently associated with a lack in care uptake. Extremes of maternal age, single parenthood and being of non-Dutch origin were associated with reduced uptake independent of SES determinants. No uptake of postpartum care was associated with maternal healthcare expenses in the highest quartile: aOR 1.34 (95% CI 1.10–1.67). Uptake below the recommended amount was associated with higher maternal and infant healthcare expenses: aOR 1.09 (95% CI 1.03–1.18) and aOR 1.20 (95% CI 1.13–1.27), respectively. **Conclusion:** Although uptake was generally high, low SES women less often received postpartum care, this being associated with higher subsequent healthcare expenses. Strategies to effectively reduce these substantial inequities in early life are urgently needed.

Introduction

The postpartum period is a critical transitional period not only for babies but also in the lives of new mothers.[1] Adequate care provision during this period by skilled maternity care professionals enables an optimal start for the new family. A healthy start following childbirth may be of substantial short and long term benefit for maternal and child wellbeing, and as such has the potential to reduce healthcare associated costs.[2,3]

The uptake of healthcare overall and the incidence of adverse health outcomes during the postpartum period are closely linked to different determinants of one's socioeconomic position; persons with a lower socioeconomic position tend to make less use of routine or preventive healthcare,[4,5] and have a higher incidence of adverse health outcomes.[3,6–10] Although a number of studies examined this relationship, the association between SES and use of postpartum care has not been investigated previously.

The strong position of primary care in the Netherlands, which includes easy access to postpartum care at home during the early postpartum period (figure 1), provides considerable potential to promote equity in maternal and infant health. This study seeks to describe the patterns of utilization of postpartum care services using a national population-based study, assessing: (i) whether different determinants of SES—represented by individual level, household level and area-level indicators—were associated with uptake of postpartum care and (ii) whether any inequalities translated in