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Diverging prevalences and different risk factors for childhood asthma and eczema: a cross-sectional study

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ABSTRACT

Objective: To compare the prevalences of and risk factors for asthma, wheeze, hay fever and eczema in primary schoolchildren in Aberdeen in 2014.

Design: Cross-sectional survey.

Setting: Primary schools in Aberdeen, North-East Scotland.

Participants: Children in Scottish school years primary 1–7 were handed a questionnaire by their class teacher to be completed by their parents and returned to the researchers by post or online.

Main outcome measures: Lifetime history of asthma, eczema and hay fever, and recent history of wheeze.

Results: 41 schools agreed to participate (87%). 11 249 questionnaires were distributed and 3935 returned (35%). A parent-reported lifetime history of asthma, eczema and hay fever was present in 14%, 30% and 24% of children, respectively. The odds of lifetime asthma increased with age (OR 1.1 per year, 95% CI 1.1 to 1.2), male sex (OR 1.89, 95% CI 1.4 to 2.3), parental smoking (OR 1.7, 95% CI 1.2 to 2.3) and eczema (OR 6.6, 95% CI 5.2 to 8.4). Prevalence of recent wheeze was also reported to be 14% and was positively associated with male sex, parental smoking and eczema. In contrast, parental eczema was the only identified predictor of childhood eczema risk.

Conclusions: The lifetime prevalence of asthma in primary schoolchildren was 14% in this survey, approximately half the prevalence of eczema. We report diverging prevalences in relation to previous studies in our locality, and different risk factors for asthma and eczema. These findings suggest that asthma and eczema are unlikely to have a common origin.

Strengths and limitations of this study

- The Aberdeen Schools Asthma Survey (ASAS) is one of the longest-running paediatric epidemiology studies in the world.
- It uses common methodology over successive cross-sectional surveys of a defined population.
- ASAS 2014 includes the entire primary school age and expands the geographical area to the modern Aberdeen city boundaries, while maintaining a subgroup using the old criteria for comparison with previous ASAS.
- The use of imputation also enabled up to an additional 349 children to be included in prevalence figures, increasing robustness.
- A limitation is the 35% response rate which may limit the representativeness of the findings.

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INTRODUCTION

Asthma is the most common chronic childhood medical condition worldwide[1] and places a significant burden on family life, society and healthcare systems.[2 3] The prevalence of childhood asthma in Aberdeen, the UK as a whole, and the wider western world rose sharply during the second half of the 20th century. Since the turn of the century, the global pattern has been far less certain. A UK wide review has provided evidence of a possible fall in childhood asthma prevalence.[4] In Merseyside,[5] a fall in childhood asthma prevalence was witnessed between 1998 and 2006. Although a falling prevalence of childhood asthma has also been detected in Canada[6] and Australia,[7] it has been suggested that, globally, rises remain more common than falls.[8] The International Study of Asthma and Allergy in Children (ISAAC) undertook three surveys of asthma prevalence in many countries between 1991 and 2003, and found evidence of asthma prevalence in 13–14 year olds still rising in some countries (eg, Central America, Spain, Portugal and Eastern Europe), of having reached a plateau in some countries (eg, New Zealand, Brazil and Uruguay) and declining in some others (eg, the UK).[9] As a result of this widespread geographical variation in paediatric asthma prevalence, repeated surveys in the same locations, which give an insight into the burden of asthma allow for the planning and delivery of healthcare.

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The Aberdeen Schools Asthma Survey (ASAS) was first carried out in 1964 and is the longest-running series of surveys of its kind in the UK and among the longest-running worldwide. In Aberdeen schoolchildren aged 9–12, the lifetime prevalence of asthma rose from 4% in 1964 to 28% in 2004, but fell to 22% in 2009. In contrast with the fall in asthma (and wheeze) between 2004 and 2009, the prevalence of eczema and hay fever remained relatively unchanged.[10–12]

The divergence in asthma and eczema prevalences seen in Aberdeen 2004–2009, and elsewhere,[13] lead us to speculate that there may be different causal pathways for asthma and eczema. Here we test the hypotheses that (1) prevalences of asthma and eczema will continue to diverge beyond 2009 in Aberdeen children and that (2) different risk factors will be associated with asthma and eczema. To test these hypotheses, and specifically to increase the age range and socioeconomic diversity of the study population, we modified the inclusion criteria used in previous ASAS from children aged 9–12 attending schools within the 1964 Aberdeen City boundaries to all primary school children (ie, aged 5–12) attending schools within the 2014 Aberdeen City limits.

METHODS

Study design and setting

A cross-sectional survey design was used. All state-run primary schools under the jurisdiction of Aberdeen City Council in North-East Scotland were invited to participate.

Participants

All children in primary classes in participating schools were eligible for the study. Class teachers in participating schools distributed questionnaires to all children in the primary classes of the school (Scottish school years primary 1–7, approximate ages 5–12 years) in May 2014. All previous ASAS were also carried out in May and this consistency excludes the potential for seasonal variation in asthma symptoms to influence parental recall and reporting of symptoms. The study size was determined by the number of children attending schools in Aberdeen city, school participation rate and parental response rate. Since this was a population epidemiology study, it was not appropriate to predetermine a sample size. Children gave the questionnaire to their parents, who completed it at home and posted it directly to the researchers. An electronic web-based response option was offered as an alternative to the paper questionnaire. Although it was not possible to contact non-responders directly due to the Data Protection Act (1998; DPA), press releases were made and posters put up at schools with historically low response rates in an attempt to encourage parents to complete the questionnaire and thus, reduce response bias. The denominator in calculating response rates was taken to be the school roll figures provided by the school office to the researchers shortly prior to the delivery of questionnaires to the school.

Measures

The questionnaire validated in previous ASAS years was distributed with a letter explaining its purpose. The key questions included those asked since the 1964 survey: 'Has your child wheezed or had a whistle in the chest in the past three years?', 'Has your child ever had asthma?', 'Has your child ever had eczema?' and 'Has your child ever had hay fever?' Questions used in the wheeze module of the ISAAC study[9] have been included in 2004 and 2009 surveys and were also included in 2014, including: 'Has your child wheezed in the past 12 months?'. Questions from the Changes in Childhood Exposure to Environmental Tobacco Smoke (CHETS) study[14] were also included this year to explore in more detail children's risk of secondhand smoke exposure. Full details of the questionnaire are presented in the online supplement. A 10% random re-entry check, conducted on the data for quality control purposes, was completed successfully. Socioeconomic classification at the postcode level was obtained for each participating child using the 2012 Scottish Index of Multiple Deprivation (SIMD),[15] which is the official index of socioeconomic status used by the Scottish Government and covers seven domains: income, employment, health, education, geographic access, housing and crime. The SIMD quintile measure was used to code socioeconomic status from 1 (least deprived) to 5 (most deprived).

Data analysis

Imputation of missing values

As previously,[12] imputation of asthma, eczema and hay fever was conducted for responses where only the wheeze question was answered.

Descriptive prevalence statistics

Mean prevalence with SD and 95% CIs were calculated for the lifetime prevalence of asthma, eczema, hay fever, wheeze in the past 12 months and wheeze in the past 3 years. These figures were for all children and separately for boys and girls. A subgroup of children aged 9–12 at school within the 1964 Aberdeen city boundaries was created to allow for direct comparisons with previous ASAS studies.

Predictors of childhood wheeze, asthma, eczema and hay fever

Five logistic regression models were constructed with observed prevalence of wheeze in the past 12 months and past 3 years, and lifetime asthma, eczema and hay fever as dependent variables. Age, sex, SIMD and number of parental smokers were included as independent variables. Parental prevalence for the corresponding child outcome measure was included in models of asthma, eczema and hay fever. Eczema was also included as an index of atopy in the models where asthma, wheeze and hay fever were the outcome. Standard statistical software was used (SPSS V.22.0.0.1 IBM, Armonk, New York, USA) and a p value of<0.05 was assumed to be significant.

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RESULTS

Study participants

Forty-one (87%) of 47 schools invited to take part agreed to participate. According to projected school roll figures for 2014,[16] this denied access to 1585 children. There was, however, no discernible socioeconomic pattern with regard to school participation. There were 11 249 children in participating schools with 3935 questionnaires returned (35%). School-level response rates ranged from 17% to 60%. Higher SIMD was associated with significantly higher response rates (r_{41}=0.609, p<0.001). Figure 1 shows the detailed recruitment pathway for ASAS 2014.

Prevalences of asthma, eczema, hay fever and wheeze

The prevalence estimates for asthma, eczema and hay fever, 12 month wheeze and 3 year wheeze were 14%, 30%, 24%, 14% and 18%, respectively, for the entire data set (table 1). Excluding completely blank questionnaires, the missing data rates were 1% for age, gender and 12 month wheeze, 3% for SIMD and 3 year wheeze, 9% for lifetime eczema prevalence and 10% for lifetime asthma and hay fever prevalence. Among the subgroup for comparison with previous ASAS surveys (ie, those aged 9–12 and within the 1964 city boundaries), the prevalence of asthma, eczema, hay fever, 12 month and 3 year wheeze were 19%, 29%, 30%, 14% and 18% (table 2), respectively. Time trends for asthma, eczema, hay fever and wheeze are shown in figure 2. Raw comparable data for 2014 are provided in table 2 and those for previous years can be found in our previous reports.[10–12]

Factors associated with asthma and other outcomes

Wheeze in the past 12 months and 3 years were significantly associated with male sex, parental smoking and childhood eczema, but not with age or SIMD. Lifetime prevalence of asthma was positively associated with age, male sex, parental smoking, childhood eczema and parental asthma, but not with SIMD. Lifetime prevalence of eczema was significantly associated with parental eczema, but not with age, sex, SIMD or parental smoking. Lifetime prevalence of hay fever was associated with increased age, male sex, childhood eczema and parental hay fever, but not with SIMD or parental smoking (table 3).

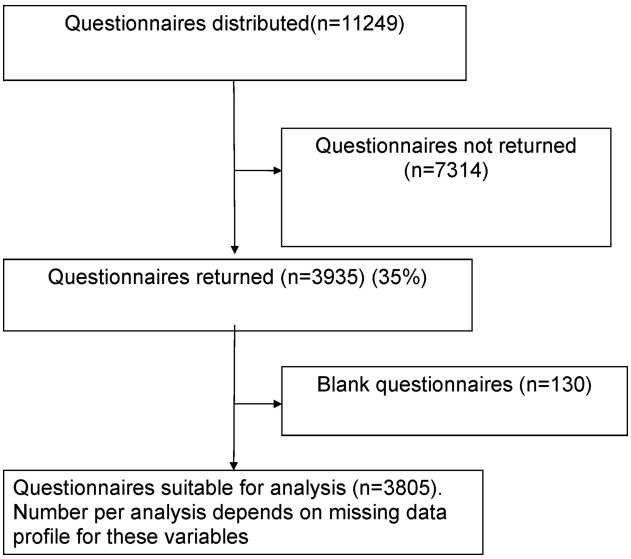

Figure 1 Consort-style figure summarising the number of participants in the 2014 Aberdeen Schools Asthma Survey.

DISCUSSION

Childhood asthma and atopy (as evidenced here by eczema) are common chronic conditions which lead to morbidity and poor quality of life for both child and parent and therefore, merit close surveillance to allow planning of healthcare delivery. ASAS 2014 provides an up-to-date assessment of asthma and eczema prevalence, and previous survey results have been consistent with prevalences in the UK. The first main finding of this study is that asthma and eczema both remain common in today's childhood population. Asthma, but not eczema, prevalence has fallen since our 1999 and 2004 surveys, but is still approximately twice the prevalence reported in 1989. The second main finding is the divergent trends in asthma and eczema prevalence which, coupled with the associations between age, parental smoking and sex with asthma but not with eczema, suggest that there may be different underlying causal pathways for asthma and atopy or non-respiratory allergic conditions. The fall in asthma prevalence and its association with parental smoking is pertinent in the context of the Smoking, Health and Social Care (Scotland) Act (2005) which prohibited smoking in enclosed public spaces from March 2006. There is evidence that this Act has reduced childhood hospital admissions for asthma.[17] Ours is the first survey of childhood asthma prevalence in a Western European population since our previous publication in 2011[12] and gives a novel insight into the burden of childhood asthma; we are confident that the prevalence of childhood asthma is falling and the trend since 2004 suggests that a further fall might be anticipated. Falling asthma prevalence since the year 2000 has previously been noted in Aberdeen[12] and Merseyside[5] in the UK, as well as in Ontario, Canada[7] and Belmont, New South Wales, Australia.[8] Therefore, the prevalence results reported here are in keeping with observed trends in the UK and certain other Western countries and provide evidence for a continuation of these trends in these localities to 2014. However, the generalisability of asthma epidemiological studies is limited to some extent by widespread geographical variation in prevalence values and trends as revealed by ISAAC.[9]

The relationship between asthma and atopic conditions, such as eczema and hay fever, is complex and our study highlights some of these inconsistencies. For

Table 1 Demographics and prevalence of wheeze, asthma, eczema and hay fever among primary schoolchildren aged 5–12 in Aberdeen city in 2014

	Boys		Girls		Total	
	Raw	Imputed	Raw	Imputed	Raw	Imputed
N (%)[a]	1896 (48%)		1903 (48%)		3935 (100%)	
Age[b]	9.1 (9.0 to 9.2)		8.9 (8.8 to 9.0)		9.0 (9.0 to 9.1)	
SIMD[c]	5 (2)		4 (2)		4 (2)	
Parental smokers						
Neither	1531 (81%)		1518 (80%)		3183 (81%)	
One	239 (13%)		260 (14%)		501 (13%)	
Both	126 (7%)		125 (7%)		251 (6%)	
Parental asthma						
Neither	1180 (69%)		1189 (69%)		2374 (69%)	
One	473 (28%)		465 (27%)		939 (27%)	
Both	60 (4%)		65 (4%)		125 (4%)	
Parental eczema						
Neither	1178 (72%)		1200 (73%)		2383 (73%)	
One	405 (25%)		405 (25%)		811 (25%)	
Both	47 (3%)		41 (3%)		88 (3%)	
Parental hay fever						
Neither	804 (47%)		818 (48%)		1626 (47%)	
One	699 (41%)		666 (39%)		1367 (40%)	
Both	219 (13%)		225 (13%)		444 (13%)	
Child asthma[d] (N_e=3426)	17.3 (15.5 to 19.1)	17.0 (15.2 to 18.8)	11.1 (9.6 to 12.6)	11.2 (9.7 to 12.7)	14.2[f] (13.0 to 15.4)	14.1 (12.9 to 15.2)
Child eczema[d] (N_e=3462)	31.2 (29.0 to 33.4)	31.4 (29.2 to 33.6)	29.1 (27.0 to 31.2)	29.0 (26.9 to 31.2)	30.2 (28.6 to 31.7)	30.2 (28.7 to 31.7)
Child hay fever[d] (N_e=3425)	26.6 (24.5 to 28.7)	26.78 (24.6 to 28.8)	21.6 (19.6 to 23.5)	21.9 (19.9 to 23.8)	24.1[g] (22.7 to 25.5)	24.3 (22.8 to 25.7)
Child wheeze 3 years (N=3800)	21.5 (19.7 to 23.4)		15.4 (13.8 to 17.0)		18.4[f] (17.29 to 19.7)	
Child wheeze 12 months[d] (N=3772)	16.2 (14.6 to 17.9)		11.8 (10.4 to 13.3)		14.0[f] (12.9 to 15.1)	

a, There were 136 children (4%) of undeclared gender, b, mean (95% CIs), c, median quintile (IQR), d, % (95% CIs), e, for raw data, f, significant gender difference at p<0.001 (assessed on raw data), g, significant gender difference at p<0.01.
SIMD, Scottish Index of Multiple Deprivation.

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Table 2 Demographics and prevalence of wheeze, asthma, eczema and hay fever among primary schoolchildren aged 9–12 in the 1964 city of Aberdeen in 2014.

	Boys		Girls		Total	
	Raw	Imputed	Raw	Imputed	Raw	Imputed
N (%)	402 (50%)		406 (50%)		808 (100%)	
Age[a]	11.29 (11.18 to 11.3)		11.11 (11.0 to 11.2)		11.2 (11.1 to 11.2)	
SIMD[b]	3 (3)		3 (3)		3 (3)	
Parental smokers						
Neither	306 (76%)		298 (73%)		606 (75%)	
One	58 (14%)		77 (19%)		135 (17%)	
Both	38 (10%)		31 (8%)		69 (9%)	
Parental asthma						
Neither	248 (70%)		253 (70%)		501 (70%)	
One	98 (28%)		88 (24%)		186 (26%)	
Both	9 (3%)		19 (5%)		28 (4%)	
Parental eczema						
Neither	233 (71%)		258 (75%)		491 (73%)	
One	89 (27%)		75 (22%)		164 (24%)	
Both	7 (2%)		12 (4%)		19 (3%)	
Parental hay fever						
Neither	178 (51%)		175 (48%)		353 (49%)	
One	130 (37%)		147 (41%)		277 (39%)	
Both	44 (13%)		41 (11%)		85 (12%)	
Child asthma[c] (N_d=720)	23.6 (19.2 to 27.9)	23.2 (18.9 to 27.6)	13.7 (10.1 to 17.2)	14.0 (10.4 to 17.6)	18.6[e] (15.8 to 21.5)	18.6 (15.8 to 21.5)
Child eczema[c] (N_d=708)	28.6 (23.8 to 33.3)	29.0 (24.3 to 33.8)	29.15 (24.3 to 33.8)	29.2 (24.5 to 33.9)	28.8 (25.5 to 32.2)	29.1 (25.9 to 32.5)
Child hay fever[c] (N_d=724)	29.9 (25.3 to 34.7)	30.3 (25.6 to 35.1)	29.8 (25.0 to 34.4)	30.1 (25.4 to 34.8)	29.8[e] (26.5 to 33.2)	30.2 (26.9 to 33.6)
Wheeze 3 yrs (N=805)	23.9 (19.8 to 28.1)		12.6 (9.4 to 15.9)		18.3[e] (15.6 to 20.9)	
Wheeze 12 mths[c] (N=800)	17.8 (14.0 to 21.5)		10.0 (7.1 to 12.9)		13.9[e] (11.58 to 16.3)	

a, mean (95% CIs), b, median quintile (IQR), c, % (95%CI), d, for raw data, e, significant gender difference at p<0.001 (assessed on raw data).

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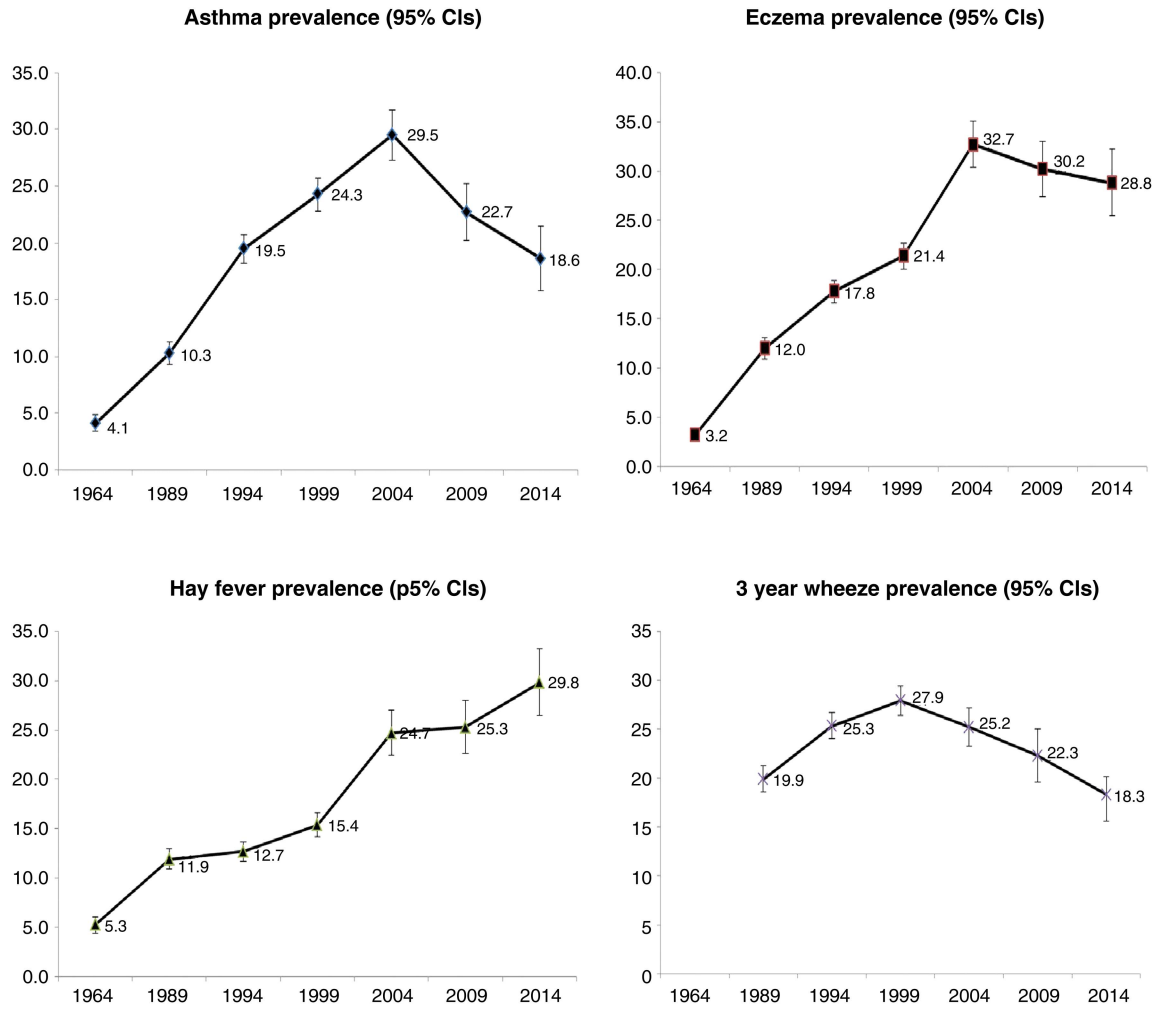

Figure 2 Time trends for prevalence of wheeze, asthma, eczema and hay fever among primary schoolchildren aged 9–12 in the 1964 city of Aberdeen 1964–2014. Dots on the line represent mean prevalence and bars represent 95% CIs.

example, the parallel rise in asthma and eczema prevalence seen in ASAS between 1964 and 2004, and the sixfold increased risk for a child with asthma also having eczema suggest that there might be a common origin for both conditions. Conversely, the divergent trends in prevalence since 2004 and the associations with gender, age and parental smoking for asthma but not eczema are inconsistent with a common origin hypothesis. Hay fever can be considered an allergic condition of the upper airways and our observations show common risk factors for hay fever and asthma, but the same prevalence for eczema. This might be explained by hay fever being a hybrid condition that shares an underlying asthmatic airway abnormality in the upper respiratory tract along with systemic atopy. Atopy is an immunological condition, and eczema[18] and skin prick reactivity[19] in infancy are associated with increased risk for later asthma, but there is increasing recognition that the airway epithelial cell, and not the humoral immune system, is important to the development of asthma.[20] Other reasons for falling prevalence in asthma but not eczema prevalence include changes in diagnostic practice for asthma, but not eczema, and reduced exposure to secondhand smoke (shown here to be related to asthma but not eczema prevalence).

A major strength of ASAS is the common methodology used over successive instances of the longest-running series of paediatric asthma epidemiology studies in the UK and one of the longest-running surveys worldwide. A further strength of ASAS 2014 is the inclusion of a wider age range and updating of the geographical area to the modern city boundaries, which include many suburban developments built following the expansion of the oil industry in Aberdeen in the 1970s and 1980s. This increases its generalisability to the modern population; however, a subgroup was retained using the previous criteria for comparability with earlier studies. Moreover, the sample characteristics of the comparable subgroup in ASAS 2014 are closely matched to those of previous ASAS, suggesting that reduced response rate is unlikely to have fundamentally changed our sample characteristics. The use of imputation also enabled up to an additional 349 children to be included in prevalence figures increasing the robustness. A

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Table 3 Predictors of wheeze, asthma, eczema and hay fever among primary schoolchildren aged 5–12 in Aberdeen city in 2014

	Asthma	Eczema	Hay fever	Wheeze in previous 3 years	Wheeze in previous year
OR per year of age	1.1 (CI 1.1 to 1.2), p<0.001	1.0 (0.94 to 1.0)*	1.1 (1.1 to 1.2), p<0.001	1.0 (0.9 to 1.00)*	1.0 (0.9 to 1.0)*
OR for boys compared to girls	1.9 (1.4 to 2.4), p<0.001	1.1 (0.9 to 1.3)*	1.3 (1.1 to 1.6), p=0.01	1.6 (1.3 to 1.9), p<0.001	1.5 (1.2 to 1.8), p<0.001
SIMD					
quintile 1	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)
quintile 2	0.8 (0.5 to 1.3)*	0.9 (0.6 to 1.2)*	0.8 (0.6 to 1.2)*	1.0 (0.7 to 1.3)	1.0 (0.7 to 1.5)
quintile 3	0.8 (0.5 to 1.3)*	0.9 (0.6 to 1.3)*	1.1 (0.7 to 1.6)*	1.2 (0.9 to 2.0)	1.3 (0.8 to 1.9)
quintile 4	0.9 (0.6 to 1.5)*	0.9 (0.7 to 1.3)*	0.9 (0.6 to 1.3)*	1.2 (0.8 to 1.7)	1.00 (0.7 to 1.5)
quintile 5	0.7 (0.5 to 1.0), p=0.05	0.9 (0.7 to 1.2)*	0.9 (0.6 to 1.2)*	0.9 (0.7 to 1.3)*	0.8 (0.6 to 1.1)*
Parental smokers					
Neither	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)
One	1.6 (1.1 to 2.3), p<0.01	1.0 (0.8 to 1.3)*	1.1 (0.8 to 1.5)*	1.4 (1.1 to 1.9), p=0.008	1.5 (1.1 to 2.0), p=0.004
Both	1.5 (0.9 to 2.3)*	0.8 (0.6 to 1.1)*	0.8 (0.5 to 1.3)*	1.4 (2.5 to 3.7)*	1.5 (1.0 to 2.2), p=0.05
Parental condition[a]	2.8 (2.3 to 3.4), p<0.001	3.1 (2.7 to 3.6), p<0.001	3.0 (2.6 to 3.4), p<0.001	NA	NA
Eczema	5.5 (4.3 to 7.1), p<0.001	NA	4.1 (3.4 to 5.1), p<0.001	3.1 (2.5 to 3.79), p<0.001	2.7 (2.2 to 3.4), p<0.001

a=the same condition as predictor and outcome.
*Non-significant.
NA, not applicable.

limitation is the 35% response rate which may limit the representativeness of the findings. Although there was a significant association between SIMD and school-level response rate, SIMD was not associated with the study outcome measures. It is possible that parents of children with asthma were more likely to participate, but this sampling bias would have reduced not exaggerated our observed fall in asthma prevalence and would not threaten the validity of our finding of divergent prevalences for asthma and eczema. Although this approach is widely used and validated in epidemiology, this ASAS, as per all previous ASAS since 1989, relied on parents' report and it is possible that this could have introduced diagnostic bias.

In light of the falling response rates in surveys, such as ours in the UK[21] and elsewhere,[22] it is important to consider whether traditional epidemiological methods are the best approaches to take in future. Although lower than ASAS 2004 (57%)[10] and 2009 (54%),[12] our response rate is higher than the 2006 childhood asthma epidemiology study in Merseyside (30%)[5] and an epidemiological study in a different disease area run by a separate team in Aberdeen (33%).[23] Falling response rates are likely to result from a combination of several factors, including DPA which was instituted in 2000,[16] survey fatigue[17] and an increase in unsolicited mailing,[17] that we and other researchers are unable to address. The response rate in ASAS fell from 85% in ASAS 1999 prior to the enactment of DPA to 57% in ASAS 2004—the first ASAS in the DPA era. Therefore, it might be better for future UK childhood asthma epidemiological studies to consider using alternative approaches such as anonymised general practitioner prescribing or hospital admissions data to provide a whole population perspective, although these approaches preclude asking targeted questions and rely on information already held on clinical databases. In addition, these approaches do not rely on self-reported or parent-reported measures.

In summary, we report diverging prevalence figures and different predictors for asthma and eczema in primary schoolchildren in Aberdeen, Scotland. These findings are not consistent with the hypothesis that paediatric asthma and eczema have a common origin, suggesting that the conditions are likely to have different underlying mechanisms of action.

Contributors NT, GD, LA and ST were involved in conception and design. MB, NT and ST were involved in project management. MB collected data. MB, LA and ST undertook analysis. MB drafted the initial version of the manuscript and all authors contributed to revisions. ST is the guarantor.

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Competing interests None declared.

Ethics approval Ethical approval for this study was granted by the University of Aberdeen College of Life Sciences and Medicine Ethics Review Board.

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Governance approval for the recruitment of schools was granted by Aberdeen City Council Learning and Leisure Services.

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Data sharing statement No additional data are available.

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Diverging prevalences and different risk factors for childhood asthma and eczema: a cross-sectional study

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Questionnaire number

Aberdeen Schools Asthma Survey Questionnaire 2014

Chest
Heart &
Stroke
Scotland

1 4 9 5
UNIVERSITY
OF ABERDEEN

child
HEALTH

In what month and year was your child born? ☐☐ Month ☐☐ Year

Which primary school does your child attend? .....

Which primary school year is your child in at present? P ☐
For children in a composite class, which year would they be in if there wasn't a composite class?

Is your child a boy or a girl? ☐ Boy ☐ Girl

Was he/she born in Aberdeen? ☐ Yes ☐ No

What is the post code where your child currently lives A B ☐☐ ☐☐☐

Aberdeen Schools Asthma Survey 2014

		YES	NO
1.	Has your child wheezed or had a whistle in the chest in the **past three years**?	☐	☐
	If YES, did this occur		
	Less than once every three months	☐	
	Once every three months	☐	
	More than once every three months	☐	
2.	Does a common cold bring on the wheeze?	☐	☐
	If YES, is a cold the only thing which brings on the wheeze?	☐	☐
	If NO, which other things bring on the wheeze?		
	Exercise ☐	Pets	☐
	Cold weather ☐	House dust	☐
	Other		☐
3.	Has your child had a persistent night cough in the **past three years**?	☐	☐
	If YES, has this occurred		
	Less than once in three months?	☐	
	Once in every three months?	☐	
	More than once in every three months?	☐	
4.	Has your child had wheezing or whistling in the chest in the **last 12 months?**	☐	☐
	If YES, how many attacks of wheezing has he/she had in the **last 12 months?**		
	1-3	☐	
	4-12	☐	
	More than 12	☐	

5. In the **last 12 months**, how often, on average, has your child's sleep been disturbed due to wheezing?

- Never ☐
- Less than one night per week ☐
- One or more nights per week ☐

	YES	NO
6. In the **last 12 months**, has wheezing ever been severe enough to limit your child's speech to only one or two words at a time between breaths?	☐	☐
7. Has your child ever had — Asthma?	☐	☐
Eczema?	☐	☐
Hay Fever?	☐	☐
8. Is your child currently on any treatment for wheeze or asthma?	☐	☐

If YES, which treatment (tick all that apply)

Clenil /Budesonide (brown inhaler)	☐
Flixotide (orange inhaler)	☐
Seretide (purple inhaler)	☐
Salmeterol (green inhaler)	☐
Symbicort (white inhaler with red base)	☐
Montelukast (pink chewy tablet)	☐
Salbutamol or terbutaline (blue inhaler)	☐
Other (please list)	☐

9.a. Has mother ever had	Asthma?	☐	☐
	Eczema?	☐	☐
	Hay Fever?	☐	☐

9.b. Has father ever had

Asthma?	☐	☐
Eczema?	☐	☐
Hay Fever?	☐	☐

10. Does anyone living in the same house as your child smoke? ☐ ☐

If YES, please go to question 11. If no, please go to question 15.

11. Do any of the following people smoke? (please tick one box for each person)

	Smokes every day	Smokes sometimes	Does not smoke	Don't know	My child doesn't have/see this person
Child's mother	☐	☐	☐	☐	☐
Child's father	☐	☐	☐	☐	☐
Stepfather (mother's partner)	☐	☐	☐	☐	☐
Stepmother (father's partner)	☐	☐	☐	☐	☐
Other people in the house	☐	☐	☐	☐	☐

12. How often do the following people smoke in the child's home (where your child lives all or most of the time)? (please tick one box for each person)

	Smokes in the home every day	Smokes in the home sometimes	Does not smoke in the home	Don't know	My child doesn't have or see this person
Child's mother	☐	☐	☐	☐	☐
Child's father	☐	☐	☐	☐	☐
Stepfather (mother's partner)	☐	☐	☐	☐	☐
Stepmother (father's partner)	☐	☐	☐	☐	☐
Other people in the house	☐	☐	☐	☐	☐

13. While your child was inside your home yesterday was anyone smoking there?

- My child wasn't at home yesterday ☐
- There was no one smoking there ☐
- Yes someone was smoking there ☐
- Don't know ☐

14. While your child was in a car yesterday was anyone smoking there?

- My child wasn't in a car yesterday ☐
- There was no one smoking there ☐
- Yes someone was smoking there ☐
- Don't know ☐

15. If you are willing to be contacted about future surveys relating to asthma and allergy in children we would be very grateful if you could provide the following information

Your child's name .....

Your child's full address .....

Thank you for completing this questionnaire.

Please return it to us using the pre-paid envelope.

If you have any questions, please contact
Dr Steve Turner (01224 438475, email s.w.turner@abdn.ac.uk) or
Dr Nara Tagiyeva-Milne (01224 438453, email n.tagiyeva-milne@abdn.ac.uk),
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