

How training affects Australian paediatricians' management of obesity

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► Additional data are published online only. To view these files please visit the journal online (<http://dx.doi.org/10.1136/archdischild-2012-301659>).

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Received 10 January 2012

Accepted 11 June 2012

ABSTRACT

Objective Secondary care could be the optimal sector for managing child and adolescent obesity, given low primary care uptake and limited tertiary services. We aimed to determine Australian paediatricians' self-reported competence and training in managing obesity and, in a linked patient-level audit, whether these predict rates of measurement and obesity diagnosis.

Design, setting and patients Australian Paediatric Research Network members completed an online survey, plus a prospective patient-level audit of up to 100 consecutive consultations over 2 weeks.

Main outcome measures *Survey*: self-reported competencies, training in and use of clinical skills in obesity and its comorbidities. *Audit*: paediatricians reported each child's height, weight, age, sex and diagnoses including overweight/obesity.

Results Of 166 (44.7% response) paediatricians, most felt very/quite competent in assessing (89%) and managing (68%) obesity, but few in making a difference to obesity (20%) or managing hypertension (45%), insulin resistance (32%), fatty liver disease (22%) or dyslipidaemia (21%). The audit of 200 (66.2% response) paediatricians included 8345 patients. On average paediatricians recorded height and weight for 66.5% of patients (SD 30.0%, range 0–100%). Of the 296 (12.3%) patients obese by CDC cutpoints, 118 (39.9%) were diagnosed as obese; perceived competence increased the odds of recording this diagnosis but not measurement. Training levels were low, showed little association with measurement or obesity diagnosis, and skills learnt were not routinely used.

Conclusions There is a clear need for better paediatrician training in obesity management. However, care and outcomes for obese children are unlikely to improve unless effective management models can be operationalised systematically.

INTRODUCTION

In developed countries like Australia, the long-term implications of obesity¹ constitute a major public health challenge for healthcare systems and society.² While prevention of childhood and adolescent obesity is a priority, effective and accessible treatment is also needed for the 5–10% of individuals who are already obese in childhood or adolescence.³

Clinicians caring for children and adolescents must consequently adapt their training and practice to this evolving area of need. In a large recent European study, 52% of overweight children attending specialist clinics had at least one cardio-metabolic risk factor, and 29% and 32% showed signs of fatty liver disease and dyslipidaemia, respectively.⁴ Other medical problems such as

What is already known on this topic

- Inadequate treatment access and health workforce training are significant barriers to providing optimal care for obese children and adolescents.
- Primary care obesity interventions are rarely efficacious and tertiary services are limited, so secondary care may be the optimal pathway for managing child/adolescent obesity.
- How paediatricians approach obesity, their skills in managing obesity, and how training affects their skills and self-reported competencies, are unknown.

What this study adds

- Training in specific skills improved self-reported competence and resulted in slightly higher rates of diagnosis.
- Few paediatricians received training, even fewer used the learned skills, and very few felt competent in managing comorbidities or making a difference to obesity.
- Despite feelings of inefficacy around managing child/adolescent obesity, paediatricians are interested in participating in obesity-related research.

obstructive sleep apnoea, hypertension and orthopaedic problems are also more prevalent in clinically obese children,⁵ as are a range of mental health issues.⁶⁻⁹

However, access to treatment and health workforce training remain significant barriers to optimising care for obese children in many countries.¹⁰ In Australia, the handful of specialised paediatric tertiary weight management centres in major cities have long waiting lists and there are relatively few community-based treatment alternatives.¹¹ Despite nearly a decade of national guidelines for managing childhood obesity,¹² less than 2% of overweight or obese Australian children receive weight management when they attend primary care services.¹³

Low primary care uptake and efficacy¹⁴⁻¹⁷ coupled with very limited tertiary services¹¹ point to secondary care as possibly the optimal sector for the majority of clinical management of child and adolescent obesity and its complications. In

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Australia, paediatricians play a central role in assessing and treating chronic conditions such as autism spectrum disorders, asthma and developmental/behavioural issues. However, little is known about how they currently approach obesity, how well-equipped they are to manage obesity and its complications, and whether training and self-perceived competencies in various aspects of weight management affect the degree to which paediatricians address obesity in their clinical practice.

A further issue is the extent to which secondary care paediatricians might contribute to obesity-related research. This is crucial given that current treatments have only modest efficacy¹⁸ and remain dominated by expert consensus, for example.¹⁹ In a recent national Delphi survey, Australian paediatricians named effective management of childhood obesity and its comorbidities as their foremost clinical research priority,¹⁵ but no studies have examined the types of research in which they may be willing to participate.

Therefore, by linking national data from (a) an online survey of Australian paediatricians' self-perceived competence and training in managing obesity with (b) a prospective patient-level practice audit, we aimed to determine:

1. General paediatricians' self-reported competence in managing obesity and its comorbidities, and their training in and use of relevant skills/techniques
2. Whether such training predicts self-reported competence in (a) managing obesity and (b) making a difference to an obese child's weight
3. Whether competence and/or training predict the odds of:
 - A. Children having measurements recorded, and
 - B. Obese children having a recorded obesity diagnosis in the linked practice audit
4. Interest in participating in childhood obesity research.

METHOD

Design

Established in 2007, the Australian Paediatric Research Network (APRN) is a national network to facilitate multi-site research in non-tertiary paediatric outpatient settings.²⁰ This report links obesity-related data from two APRN projects: the 2010 online Multitopic Survey,²⁰ and the Children Attending Paediatricians Study (CAPS) audit,²¹ described below.

Participants

Members were recruited from the 1006 general paediatricians registered in 2007 with their professional body, the Royal Australasian College of Physicians. All Australian states and territories are proportionally represented, and APRN members and non-members are broadly similar other than minor differences in age, sex and practice area type (metropolitan, regional, rural).¹⁵

Multitopic Survey

In late 2009 all members were emailed an invitation to submit possible survey topics to the APRN Steering Group to inform new research in APRN-prioritised areas.²⁰ Each of the five proposed topics was then developed into a two-page survey by a small multi-state team of interested paediatricians. Following piloting, these were streamlined and combined into a single online survey. All 372 APRN members registered in April 2010 were eligible and were sent four emails at weekly intervals in March and April 2010: an advance-notice email, an email containing instructions and the online survey link, a reminder and a final reminder.

The obesity questions (see supplementary online figure S1) were designed by MW, LB and ED and probed three main areas.

Twelve questions explored *self-reported competence* in managing obesity and its comorbidities, with four response options collapsed into 'not at all/a little' versus 'quite/very' competent for logistic regression analyses. Six questions probed *self-reported training in and use of skills/techniques* relevant to managing obesity and its comorbidities, each asking whether respondents were trained in the skill/techniques (yes/no) and, if so, whether they used it/them regularly (yes/no). Finally, paediatricians indicated their *interest in participating in childhood obesity research* (yes/no), and if 'yes', their more specific obesity research interests.

Children Attending Paediatricians Study

CAPS (described in detail elsewhere²¹) was the first prospective national audit of paediatric practice in secondary care settings, including private consulting rooms, community health centres and hospital outpatient clinics. Briefly, all 302 general paediatricians who had joined the APRN by October 2008 were eligible; subspecialists and those without an outpatient practice were excluded. In October–November 2008, participants prospectively completed a de-identified information form for each patient seen in their outpatient settings for either 100 consecutive patients or all patients seen over a 2-week period, whichever was reached first. The form (see supplementary online figure S2) was modelled on the Morbidity and Treatment Survey of the Bettering the Evaluation and Care of Health programme, a continuous national study of general practice activity in Australia.²²

We extracted paediatrician-recorded patient height and weight, sex and date of birth, and diagnoses/problems for each clinical encounter. Height, weight and resulting body mass index (BMI; kg/m²) were standardised to age- and sex-specific z scores using the CDC 2000 growth reference²³; all values outside ± 5 SD were considered spurious. We used recommended CDC clinical cutpoints of BMI ≥ 95 th centile for obesity and BMI ≥ 85 th and < 95 th centile for overweight,¹² and also described BMI status by International Obesity TaskForce cutpoints.²⁴ Paediatricians recorded up to four current diagnoses for each clinical visit, using a list of 60 pre-coded conditions (which included the single diagnosis 'overweight/obesity')²¹ or by writing the diagnoses out in full.

Covariates

Paediatrician characteristics from the APRN member database included age group, sex, practice type (community/private/public hospital clinic) and Socio-Economic Indexes For Areas (SEIFA) disadvantage index¹³ of practice postcode. SEIFA values are standardised scores by geographical area that, using census data, numerically summarise Australia social and economic conditions (national mean 1000, SD 100; higher values represent greater advantage). *Child characteristics* were sex and age group.

Statistical analysis

We report aims 1 and 4 using descriptive statistics. To determine predictors of (a) perceived competence in managing obesity and/or (b) making a difference to weight (aim 2), we used eight logistic regression models, each adjusted for paediatrician age, sex and disadvantage index of practice postcode. The four predictors were the total (summed) numbers of (a) skills/techniques in which trained, (b) skills/techniques trained in and used regularly, (c) comorbidities the paediatrician felt very or quite confident in managing, and, as a sensitivity

Table 1 Australian paediatricians' self-reported competencies in managing obesity and its comorbidities

		% Reporting (n=166)			
Perceived competency	Mean (SD)	Very (3)	Quite (2)	A little (1)	Not at all (0)
Obesity management					
Discussing child's weight when a parent broaches it	2.6 (0.6)	67	31	1	1
Broaching issue of an obese child's weight yourself	2.4 (0.7)	47	45	7	1
Assessing an obese child	2.2 (0.7)	34	55	10	1
Managing a child with obesity	1.7 (0.7)	13	53	30	4
Making a difference to an obese child's weight	1.1 (0.6)	2	18	69	10
Comorbidity management					
Obstructive sleep apnoea	1.7 (0.9)	15	48	27	10
Depression	1.6 (0.8)	13	44	34	10
Bullying and social difficulties	1.6 (0.8)	13	42	38	7
Insulin resistance and/or pre-diabetes	1.1 (0.9)	7	25	40	28
Hypertension	1.3 (0.8)	4	41	36	19
Fatty liver disease	0.9 (0.8)	3	19	41	37
Dyslipidaemia	0.9 (0.7)	1	19	51	29

analysis, (d) comorbidities the paediatrician felt very confident in managing.

For aim 3, we merged paediatrician-level self-reported data from the Multitopic Survey to individual CAPS records of children aged ≥ 2 and ≤ 18 years for paediatricians who took part in both surveys. We fitted marginal logistic regression models using Generalised Estimating Equations,²⁵ which allow for intra-paediatrician correlation of patient outcomes, to examine the predictors of the odds of (a) having complete height and weight measurements, and (b) an obese child (by diagnosis and/or measurement) being diagnosed as 'overweight/obese'. Predictors were competence in (a) assessing an obese child, (b) managing obesity, (c) making a difference to child weight, and (d) the individual and summed skills, techniques and comorbidities variables. We adjusted for factors previously found to predict measurement (type of practice, child age group) and diagnosis (child sex and age group) (Campbell *et al*, under review, *International Journal of Obesity*).

All analyses used Stata V.11.1 for Windows (Stata, College Station, Texas, USA).

Ethics

The Multitopic Survey did not require ethics approval. CAPS was approved by the Royal Children's Hospital Human

Research Ethics Committee (CA28088), with parents assenting verbally to inclusion of their child's anonymous data.

RESULTS

Participants

Of the 371 APRN members eligible for the Multitopic Survey, 180 (48.5%) responded overall and 166 (44.7%) to the obesity section. Of the 302 members eligible for CAPS, 200 (66.2%) participated, reporting on 8345 patients during the 2-week audit. Survey respondents were more likely to work full time and in community health than non-respondents, but were otherwise similar on most characteristics (see supplementary online table S3); we have previously reported comparable findings for CAPS.²¹

Self-reported competence

While almost all paediatricians felt very or quite competent discussing a child's weight when broached by a parent (mean 2.6 of a possible 3.0), progressively fewer felt competent broaching it themselves (mean 2.4), assessing (mean 2.2) and managing (mean 1.7) obese children, and making a difference to an obese child's weight (mean 1.1) (table 1). Most felt very/quite competent in managing obstructive sleep apnoea (64%), depression (57%) and bullying (55%), but only 46%, 32%, 22% and 20% in managing obesity-related hypertension, insulin resistance, fatty liver disease and dyslipidaemia, respectively. Less than 10% endorsed 'very' confident for each of these items.

Training

Table 2 shows that 53% of respondents reported training in assessing obesity-related comorbidities, but only 37% in managing them. Even fewer were trained in specific management skills—less than 20% for each of the behavioural or formal problem-solving techniques, measuring and interpreting waist circumference, and motivational interviewing. Furthermore, training often did not translate into use: less than 30% of those trained in each skill/technique reported using it, with an especially low uptake of formal problem-solving techniques (13% of those trained).

Table 3 shows that, for every additional skill/technique in which a paediatrician was trained, self-reported competence in managing obesity rose by 40% ($p=0.005$) and in making a difference by 50% ($p=0.001$). These same outcomes rose by 60% ($p<0.001$) and 30% ($p=0.007$), respectively, for every additional comorbidity that paediatricians felt very/quite confident in managing. No such associations were evident when considering only the number of skills actually used or the number of comorbidities that paediatricians were very (as opposed to very/quite) confident in managing (see table 3).

Table 2 Self-reported training in and use of skills and techniques that may assist obesity management

Skill/technique	Percent (95% CI)		
	Trained in the skill (n=166) (a)	Trained in and use the skill (n=166)	Use skill regularly, if trained (denominator is column a)
Assessment of obesity-related comorbidities	53 (45 to 61)	14 (9 to 21)	26
Management of obesity-related comorbidities	37 (30 to 45)	10 (6 to 16)	27
Behavioural techniques to modify food and physical activity	19 (13 to 25)	4 (2 to 8)	23
Formal problem-solving techniques	19 (13 to 25)	2 (0.7 to 6)	13
Measuring and interpreting waist girth	14 (9 to 21)	4 (1 to 8)	22
Motivational interviewing	12 (8 to 18)	2 (0.7 to 6)	20

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Table 3 Self-reported management skills as predictors of perceived competence in managing and making a difference to obesity* (n=152)

Total number of	Odds of reported competence† in			
	Managing obesity		Making a difference to an obese child's weight	
	OR (95% CI)	p Value	OR (95% CI)	p value
Skills/techniques				
Trained in (mean 1.5 (SD 1.5); range 0–6)	1.4 (1.1 to 1.9)	0.005	1.5 (1.2 to 2.0)	0.001
Trained in and uses (mean 0.4 (SD 0.9); range 0–4)	1.3 (0.8 to 1.9)	0.3	0.9 (0.6 to 1.5)	0.8
Comorbidities				
Very/quite confident in managing‡ (mean 2.9 (SD 2.2); range 0–7)	1.6 (1.3 to 1.9)	<0.001	1.3 (1.1 to 1.5)	0.01
Very confident in managing‡ (mean 0.5 (SD 1.3); range 0–6)	2.2 (1.2 to 3.8)	0.01	1.1 (0.8 to 1.6)	0.4

CI and OR adjusted for paediatrician age, sex, and Socio-Economic Indexes For Areas disadvantage index tertile of practice postcode.

*Table of associations between individual obesity and comorbidity management skills/techniques available from authors on request.

†Reported competence was taken from questions asking how competent do you feel managing a child with obesity and how competent do you feel making a difference to an obese child's weight? The possible responses were 'Very', 'Quite', 'A little' or 'Not at all'; competence was defined as 'very' or 'quite'.

‡Summed items from table 1 (comorbidity management).

Prospective audit data versus reported competence, confidence and training

A total of 117 paediatricians participated in both the Multitopic Survey and CAPS, representing 3175 encounters with 2–17-year-old patients (table 4). On average, each paediatrician recorded height and weight data for 66.5% of his/her patients (SD 30.0%, range 0–100%). Obesity prevalence in the 2100 children with valid BMI data was 7.4% using International Obesity Taskforce (IOTF) cutpoints, and 12.3% using Centers for Disease Control and Prevention (CDC) cutpoints. Overall, 296 children could be classified as obese by paediatrician diagnosis and/or CDC cutpoints, of whom 118 (39.9%) had a recorded overweight/obesity diagnosis.

The odds of a child being *measured* were not related to perceived competencies (table 4) but varied by practice setting (highest in private practice, lowest in community health).

Adjusted odds of being measured actually fell as the number of skills in which a paediatrician was trained increased.

In contrast, the odds of an obese child being *diagnosed* increased by 64% and almost twofold with each increment of competence in assessment and management, respectively. Training did not predict obesity diagnosis (table 4 and supplementary online table S4), and perceived competence in making a difference to child weight was associated with neither measurement nor diagnosis.

Interest in participating in obesity research

Interest in participating in obesity research was high (table 5). Of the 71% who expressed interest, almost all (88%) were interested in research into obesity itself, and two thirds into its comorbidities. The most popular research activities were recruiting to longitudinal studies and shared-care trials with specialist obesity teams.

Table 4 Self-reported (a) competence and (b) training in obesity management as predictor of Children Attending Paediatricians Study practice audit findings

Variable	Adjusted odds of child having complete measurements		Adjusted odds of obese child having obesity diagnosis	
	OR (95% CI)*	p Value	OR (95% CI)†	p Value
Perceived competence‡ in				
Assessing an obese child	1.0 (0.7–1.4)	0.9	1.6 (1.0–2.7)	0.05
Managing childhood obesity	1.2 (0.8–1.7)	0.4	1.9 (1.3–3.0)	0.003
Making a difference to a child's weight	1.1 (0.7–1.9)	0.7	1.3 (0.8–2.3)	0.3
Training in skill/techniques§				
Assessment of obesity-related comorbidities	0.7 (0.4–1.1)	0.1	1.4 (0.8–2.6)	0.3
Management of obesity-related comorbidities	0.7 (0.4–1.3)	0.3	1.4 (0.7–2.8)	0.3
Measuring and interpreting waist girth	1.1 (0.6–2.1)	0.8	1.1 (0.4–2.5)	0.9
Behavioural techniques to modify food and physical activity	1.0 (0.5–1.8)	0.9	1.9 (0.9–4.0)	0.1
Motivational interviewing	0.5 (0.2–1.2)	0.1	1.3 (0.4–4.7)	0.7
Formal problem-solving techniques	0.4 (0.2–0.9)	0.02	1.8 (0.5–5.9)	0.4
Total number of¶				
Skills/techniques trained in	0.9 (0.7–1.0)	0.04	1.2 (1.0–1.4)	0.2
Skills/techniques trained in and used	1.0 (0.7–1.4)	1.0	1.2 (0.8–1.7)	0.5
Comorbidities very/quite confident in managing	0.9 (0.8–1.1)	0.3	1.1 (1.0–1.3)	0.05

*Allows for clustering by paediatrician, adjusted for type of practice and child age group. n(paed)=116, n(child)=3037.

†Allows for clustering by paediatrician, adjusted for child sex and child age group. n(paed)=89, n(child)=294.

‡Perceived competence is scored 0–3, analysed as a linear variable.

§Training in individual skills/techniques—yes/no variable.

¶Totals—analysed as ordinal variables.

Table 5 Australian paediatricians' interest in participating in different types of childhood obesity research

Variable	%
Interested in research (n=166)	71
Area of research (n=117, ie, 71% of 166)	
Obesity itself	88
Comorbidities of obesity	65
Other	7*
Type of research project (n=117)	
Recruiting children to a longitudinal study	83
Shared care trial—you deliver systematic joint care with specialist obesity team	64
Management trial—delivered outside your practice (eg, community setting, tertiary care)	58
Recruiting children to a data repository and/or biobank	51
Shared care trial—you deliver systematic joint care with GP	44
Management trial in your practice—you deliver intervention	40
Management trial in your practice—allied health or nurse delivers intervention	33
Age group of child (n=117)	
Any	73
Toddler (any+toddler only)	87
Primary school (any+primary school only)	95
Secondary school (any+secondary school only)	81

*Other suggested topics: obesity in special needs children; hyperinsulinism; mood, family functioning; emotional/psycho/social; useful techniques in general paediatric practice and for general practitioners (GPs); effective sustainable management strategies; and obesity as part of a genetic syndrome.

DISCUSSION

Principal findings

Low rates of diagnosis coupled with a prevalence close to that expected in the general population (7.4% using IOTF cutpoints) suggest that obesity is not a prime reason for referral to Australian paediatricians. Training in specific skills improved self-reported competence and, in turn, resulted in slightly higher rates of diagnosis in the practice audit. However, few paediatricians had received such training, even fewer used the learned skills, and very few felt competent in managing important comorbidities or making a difference to obesity. Nonetheless, interest was high in participating in obesity-related research.

Strengths and limitations

This study is, to our knowledge, unique in combining patient-level data from a national prospective audit of outpatient practice with national paediatrician-reported data on obesity-related competence and training. With regard to generalisability, less than half of Australian paediatricians are in the APRN, and less than half of APRN paediatricians responded to *both* the CAPS audit and the Multitopic Survey. However, responders and non-responders were broadly similar, and it seems unlikely that non-responders would be selectively more likely to diagnose and treat childhood obesity. Lack of national paediatrician demographic data precludes an assessment of how representative our sample is of the general paediatric workforce. Nor can we be sure that CAPS included all patients seen over the 2-week recording period, and there may be some selection bias if it did not. Finally, the study did not include any objective measure of competence or skills.

Interpretation in light of other studies

Our data are consistent with qualitative primary care studies showing that clinicians view childhood obesity as an important

health issue, yet often feel frustrated and ineffectual.^{19 26 27} Contributing factors include patient and family variables, for example, lack of perception of weight as a problem, lack of motivation and difficulty with compliance^{26 28}; a lack of support services and options for referral; the sense that clinicians need to be part of a broader systemic effort to tackle obesity^{28 29}; and the rather low efficacy of clinical intervention in randomised trials.¹⁸

Healthcare practitioners commonly express a desire for more training in childhood obesity,³⁰ but in Australia (and most likely elsewhere) there is no systematic approach to achieve this.³ Childhood obesity could be addressed during paediatric training and in subsequent continuing medical education, particularly with respect to comorbidities. However, our data suggest that training alone may not greatly influence obesity management, and practitioners also experience substantial challenges in operationalising detailed expert guidelines.³

One option would be to implement short training modules that link to algorithms and toolkits in online repositories such as those already widely used by Australian paediatricians in real-time consultations.³¹ For example, a simple toolkit for life-style counselling increased American residents' application of skills which, in turn, was associated with changes in family lifestyle and perception of child weight.³² Another option endorsed by many of our respondents would be to link secondary and tertiary practitioners via shared-care models to both support and educate. Because the effectiveness of such initiatives is unknown, all should be embedded in a culture of research and evaluation—again, endorsed by our respondents. A third (and not necessarily exclusive) option is to argue that public health measures, rather than physician-directed management, may be the best long-term investment to address the problem of paediatric obesity itself. Under this scenario, paediatrician training and research would focus on comorbidities that could benefit from skilled medical management (eg, insulin resistance, obesity-related hypertension), rather than concerted efforts to boost paediatricians' role in weight management and lifestyle guidance.

CONCLUSION

The role of paediatricians in improving health care and outcomes for obese children remains uncertain. Whatever this role, there is a clear need to systematically improve research into high-priority treatment strategies. Beyond this, benefit will only flow for obese children if effective management models can then be operationalised systematically within healthcare systems.

Acknowledgements We thank Ms Hannah Bryson for helping coordinate the Children Attending Paediatricians Study, Ms Sarah Davies for coordinating the Multitopic survey, the APRN Steering Committee for assisting with study design and implementation, and all the APRN members who took part in this project.

Contributors MW, MS, ED and LB conceived the original study; MC, MT and AP were responsible for data analysis; and MW, MC, MT, AP, MS, ED and LB wrote the manuscript. All authors had full access to all of the data (including statistical reports and tables) in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. MW is the guarantor.

Funding The Children Attending Paediatricians Study and 2010 Multitopic Survey were supported by the Murdoch Childrens Research Institute, whose research is supported by the Victorian Government's Operational Infrastructure Program, and the Paediatric and the Child Health Division of the Royal Australasian College of Physicians. Professor Wake was supported by Australian National Health and Medical Research Council (NHMRC) Population Health Career Development Award 546405, and Drs Campbell and Price were part-supported by NHMRC Population Health Capacity Building Grant 436914. The funding source had no role in the study's design; in the collection, analysis or interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

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Arch Dis Child published online July 13, 2012
doi: 10.1136/archdischild-2012-301659

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