In the UK, 1.1 million children have asthma and there are approximately 15 asthma-related children's deaths every year, of which 90% have preventable causes (National Institute for Health and Care Excellence, 2017; British Thoracic Society/Scottish Intercollegiate Guidelines Network, 2016; Royal College of Physicians, 2015). Every 20 minutes, a child is admitted to an emergency department (ED) with an asthma exacerbation (Asthma UK, 2017).

Understanding the condition and its treatment could enable children with asthma to gain better control, reduce exposure to triggers and adjust medication. Empowering them to self-manage their asthma could bring symptom relief and a sense of being in control; it could also reduce ED attendances and length of hospital admissions.

### Slough’s asthma burden
The borough of Slough, in Berkshire, has one of the highest admission rates of under-19-year-olds for asthma in England (Thames Valley Strategic Clinical Networks, 2014); 10.6% of the borough’s under-19s have an asthma diagnosis (Slough Borough Council, 2016). In 2015, Slough Clinical Commissioning Group (CCG) commissioned and funded a children’s asthma service that provides clinics, teaching sessions and home visits. From 2016, the service organised, with school nurses, the first ‘asthma bus’ tour, visiting secondary schools to engage with pupils and improve their awareness of asthma triggers, understanding of medication and devices, and management of exacerbations.

### Key points
- Childhood asthma carries a high burden in the UK, including approximately 15 asthma-related deaths every year.
- Children often do not understand what triggers asthma, what inhalers and spacers do, and why they need to adhere to treatment.
- If they understand asthma and how it is treated, children can have better control over their condition.
- In the borough of Slough, an ‘asthma bus’ visits secondary schools once a year to help children manage their condition.

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### Abstract
Slough, in Berkshire, has one of the highest hospital admission rates of under-19-year-olds for asthma in England. Since 2015, it has offered a children’s asthma service that provides clinics, teaching sessions and home visits. From 2016, the service organised, with school nurses, the first ‘asthma bus’ tour, visiting secondary schools to engage with pupils and improve their awareness of asthma triggers, understanding of medication and devices, and management of exacerbations.

### Citation
Scheduling the bus tour
We identified the third week of September as the best time for the tour. It fitted most easily into school timetables and coincided with a spike in asthma admissions. The spike was thought to be due to children’s poor adherence to treatment during the summer, increased exposure to viral infections, changes in weather, and stress due to workload, exams and new environments.

Working with the school nurses, we contacted all 16 secondary schools in Slough to schedule the visits, but by that time the end of the school year was approaching so not all responded positively. To convince them to take part, the school nurses stressed the benefits to children. Eventually, all schools agreed to host the bus for half or a whole day, depending on their size. They identified the pupils on their asthma register and we finalised the schedule, knowing that the bus could accommodate 10-12 children at a time. The planning process was overshadowed by uncertainty regarding the funding, which was only confirmed in early August.

Focusing on the basics
Between 19 and 30 September 2016, we saw about 410 pupils aged 11-17; each group spent an average of 30 minutes with the asthma bus team, which comprised an asthma and a school nurse, sometimes joined by a student nurse and/or a health visitor. We went through the basics: what inhalers do, the inhaled technique; and asthma triggers. Since children had not found the leaflet used in 2016 useful we developed our own, sourcing information from Asthma UK.

Gaps in knowledge
In 2016, around 80% of children did not understand what their inhalers did, and most did not understand the link between asthma and allergies, the importance of adherence to treatment or the benefits of using a spacer. In 2017, we noticed that returning pupils had retained some information from the previous year, although they would certainly benefit from refreshing their knowledge.

To help them retain the information, we followed up the bus visits in 2017 with emails to the schools containing basic information from the previous year, although most did not understand the link between asthma and allergies, the importance of adherence to treatment or the benefits of using a spacer. In 2017, we noticed that returning pupils had retained some information from the previous year, although they would certainly benefit from refreshing their knowledge.

A range of improvements
For the 2017 tour, we started planning early, hoping to avoid a last-minute rush, but funding - this time provided by Slough CCG and Public Health England - was not confirmed until the end of August. The total cost in that second year was £10,700. The schools now recognised the benefits of the visits and scheduling was much easier, although one school withdrew at the last minute. We encouraged children who had attended in 2016 to come back, as this would hopefully increase their understanding and adherence, and, during the 2017 tour, saw around 560 pupils.

In 2016, the pupils had suggested more interactive sessions, so for 2017 we developed short videos demonstrating inhaler and spacer technique. Since children had not found the leaflet used in 2016 useful we developed our own, sourcing information from Asthma UK.

Plans for 2018
The two asthma bus tours so far seem to have had a positive effect on hospital admissions. Fig 1 shows a clear fall in the number of ED attendances and paediatric unit admissions among 4-17-year-olds with asthma in Slough between 2015 and 2017. In 2018, our established relationships with the schools should make scheduling smoother. In 2016 and 2017, the one group who did not fully engage were the sixth-formers; work pressures and exam timetables were some of the reasons cited. We will continue to work on ways of engaging sixth-formers, and plan to attend some university preparation days. In 2018 we also want to broaden our reach and will look at what we can do for primary school children.

References
McDonald C (2017) Variation in Paediatric Care in Asthma Management. National Institute for Health and Care Excellence

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(Judges’ feedback)