Sir,

Pertussis, also known as whooping cough, is a highly infectious and possibly life threatening condition caused by Bordetella Pertussis infection. World health organisation figures from 2017 report 140,000 cases with an estimated 89,000 deaths globally in 2008\(^1\), and it is a notifiable disease in Ireland. Currently the highest incidence, morbidity and mortality occur in infants, particularly in those aged less than 2 months\(^2\). Paediatric intensive care (PICU) unit admission is often required due to its potential complications such as apnoea, pneumonia, seizures or encephalopathy.

The primary management of pertussis is by prevention through vaccination. The current national vaccination programme relies on the creation of herd immunity through vaccination with boosters throughout life, the cocooning of high risk individuals and an antenatal maternal vaccine providing direct passive immunity to the neonate up to first vaccination at two months of age. A review of pertussis epidemiological data reveals a spike in incidence in 2011-2012 that correlates with the introduction of the TdaP vaccine. In August 2012 an additional booster was recommendation for health care workers and pregnant women. The recommended gestation for administration of the antenatal vaccine was expanded from 27-36 weeks to 16-36 weeks in 2016. However despite these interventions there has been a resurgence in incidence, with 73 cases in 2014, 117 cases in 2015, 213 in 2016 and 264 in 2017\(^3\). This equates to a 3.6 fold increase in incidence over a four year period.

With this in mind we decided to audit our PICU admission data over the last 10 years (2008-2017) to investigate if this translated to an increase in B Pertussis related PICU admissions. Eleven patients were identified, one from 2011, one from 2012, four from 2016 and five from 2017. Age ranged from three weeks to eleven weeks. Three patients had co-morbid conditions. Four patients (36%) had B Pertussis combined with viral infection. Two of the patients did not survive. Seven patients (64%) required invasive mechanical ventilation with the remaining 36% requiring non-invasive ventilation. Mean PICU length of stay was 10.9 days, 7.3 days in the B Pertussis group and 16.25 days in the B Pertussis & viral illness group. None of the patients’ mothers from 2016-2017 received the antenatal pertussis vaccine.

B pertussis infection is a life threatening condition in young children and its incidence is increasing. Our
audit confirmed that this is translating into an increase in PICU admissions. 81% of B pertussis related PICU admissions from the last decade have occurred in the last two years. PICU admission is associated with a significant risk of mortality in this cohort with mortality rates up to 4% reported in the literature\(^4\). These patients also have high resource requirements and prolonged lengths of stay. Of note, none of the cases from 2016-2017 received the antenatal vaccine, which may have contributed to them developing B pertussis infection.

We feel that the issue of increasing pertussis incidence needs to be highlighted and further work done to improve antenatal vaccine uptake rates to prevent potentially avoidable morbidity and mortality.

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References