Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Short Communication

COVID-19: Four Paediatric Cases in Malaysia

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ABSTRACT

Objective: This is a brief report of 4 paediatric cases of COVID-19 infection in Malaysia
Background: COVID-19, a coronavirus, first detected in Wuhan, China has now spread rapidly to over 60 countries and territories around the world, infecting more than 85000 individuals. As the case count amongst children is low, there is need to report COVID-19 in children to better understand the virus and the disease.
Cases: In Malaysia, until end of February 2020, there were four COVID-19 paediatric cases with ages ranging from 20 months to 11 years. All four cases were likely to have contracted the virus in China. The children had no symptoms or mild flu-like illness. The cases were managed symptomatically. None required antiviral therapy.
Discussion: There were 2 major issues regarding the care of infected children. Firstly, the quarantine of an infected child with a parent who tested negative was an ethical dilemma. Secondly, oropharyngeal and nasal swabs in children were at risk of false negative results. These issues have implications for infection control. Consequently, there is a need for clearer guidelines for child quarantine and testing methods in the management of COVID-19 in children.

COVID-19, a coronavirus first detected in Wuhan in December 2019, has now spread rapidly to over 30 countries infecting more than 70000 persons. The largest study to date found that out of 44672 confirmed cases registered in China's Infectious Disease Information System up to 11 February 2020, there were 416 (0.9%) between the ages of 0-9 years and 549 (1.2%) between the ages of 10-19 years (The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team, 2020). There was one reported death in the category of 10-19 years. This seemed to indicate that the number of children infected was much less and their prognosis better compared with the adults. However, there is limited literature on COVID-19 in children.

We report 4 confirmed cases in children that were diagnosed and treated in Malaysia. The cases ranged from 20 months to 11 years of age [Table 1]. All four cases were likely to have contracted the virus in China. Of these, only one was a Malaysian who had visited Wuhan for the Chinese New Year festival as his mother originated from Wuhan. The patients were mostly asymptomatic or had mild symptoms. Case 1 was asymptomatic until day 17 when fever and diarrhoea occurred. Nevertheless, the child's swabs were negative at that time. Case 2 had intermittent fever and upper respiratory tract symptoms. Case 3 was asymptomatic throughout. Case 4 had a mild cough and wheeze that responded well to salbutamol inhaler. None of the children required treatment with anti-virals. It is unknown why children with COVID-19 appeared to have milder disease. The adults may be more susceptible due to pre-existing conditions such as hypertension, diabetes, heart disease or smoking which could weaken their

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Table 1
Demographic and Clinical data.

	Case 1	Case 2	Case 3	Case 4
Age	20 months	4 years	9 years	11 years
Gender	Male	Female	Male	Male
Ethnicity	Chinese	Chinese	Chinese	Chinese
Nationality	China	China	Malaysia	China
Method of detection	Contact tracing	Self-presentation	Screening for Wuhan evacuee	Contact tracing
Date of infection	Left Wuhan on 20 January 2020	Left Foshan on 19 January 2020.	Left Wuhan on 4 February 2020	Left Wuhan on 20 January 2020
Date of detection	24 January 2020	26 January 2020	4 February 2020	24 January 2020
Date of confirmation	25 January 2020	26 January 2020	4 February 2020	25 January 2020
Site of detection	Hotel, Johor	Emergency Dept, Hospital	Kuala Lumpur International Airport	Hotel, Johor
Site of treatment	Hospital Sungai Buloh	Hospital Sultanah Maliha, Langkawi	Hospital Seremban	Hospital Sungai Buloh
Symptoms	Asymptomatic until D17 when he developed mild fever and diarrhoea	Runny nose and cough for 2-4 weeks, intermittent fever between 25- 30 January	Asymptomatic	Mild cough for one day. Later diagnosed clinically as asthma
Method of diagnosis	Nasopharyngeal and throat swabs taken for PCR	Nasal swabs taken for PCR	Nasopharyngeal and throat swabs taken for PCR	Nasopharyngeal and throat swabs taken for PCR
Swabs negative on	10, 11 and 12 February 2020	1 and 3 February 2020	13 and 17 February 2020	10, 11 and 12 February 2020
Other investigations	Renal and liver profile normal. Rectal swab negative for COVID-19	Blood culture showed no growth. No other investigations. Nasal swab also positive for influenza A	Chest X- ray showed right perihilar opacities	Chest X- ray showed perihilar opacities
Treatment	Paracetamol and Oral Rehydration Salts	Paracetamol, oral penicillin V, loratadine	None	MDI salbutamol prn
Quarantine precautions	Quarantined with family in non-negative pressure room PPE for staff	Quarantined with younger sibling and parents in negative pressure room PPE for staff	Quarantined with father in negative pressure room PPE for staff	Quarantined with family in non-negative pressure room PPE for staff

Table 2
Swab results.

	Case 1		Case 2		Case 3		Case 4	
	OPS	NPS	OPS	NPS	OPS	NPS	OPS	NPS
1	23 Jan Positive	23 Jan Positive	26 Jan Positive	26 Jan Positive *28.01	4 Feb Positive	4 Feb Positive	23 Jan Positive	23 Jan Positive
2	5 Feb Positive *31.5	5 Feb Positive *31.04	1 Feb Negative	1 Feb Negative	7 Feb Positive	7 Feb Positive *32.05	5 Feb Negative	5 Feb Negative
3	8 Feb Negative	8 Feb Negative	3 Feb Negative	3 Feb Negative	10 Feb Positive	10 Feb Positive *35.64	8 Feb Positive *40.64	8 Feb Negative
4	9 Feb Negative	9 Feb Positive *39.97			13 Feb Negative	13 Feb Negative	9 Feb Positive *39.05	9 Feb Negative
5	10 Feb Negative	10 Feb Positive *37.55			17 Feb Negative	17 Feb Negative	10 Feb Negative	10 Feb Positive *36.42
6	11 Feb Negative	11 Feb Negative					11 Feb Negative	11 Feb Negative
7	12 Feb Negative	12 Feb Negative					12 Feb Negative	12 Feb Negative

* RT-PCR Ct Value, OPS : oropharyngeal swab, NPS : nasopharyngeal swab

ability to ward off infections. The adults may also be more susceptible to an immune overdrive that leads to acute respiratory distress syndrome (ARDS). The mild or asymptomatic presentation in children may have impacted on infection control as they could be missed by existing surveillance. Further research needs to be carried out on the paediatric population to explore this matter.

There were issues regarding the care of paediatric cases that should be highlighted. Firstly, should an infected child under quarantine be separated from parents who were tested negative? Case 1 and Case 4 were brothers who were quarantined with their grandmother who was tested positive and their mother who was initially tested negative but later tested positive. The mother was advised regarding the high risk of being infected but she insisted on being quarantined together with her mother in law and children. Even though the patients were given masks, they may not have fully complied with the proper protocol. Case 2 was quarantined together with a younger sibling and parents who were well and had negative swabs for COVID-19 throughout their stay. The CDC guidance for the prevention and control of influenza in the peri- and post-partum settings recommends temporary separation of an ill mother and her child (Centers for Disease Control and Prevention, 2020). However, this separation may lead to a negative impact on both the child and the mother. The CDC states that the risks and benefits should be discussed with the mother and decisions made in accordance with the mother's wishes.

Secondly, there are difficulties to obtain respiratory samples from paediatric patients. The 20-month-old child vomited on the doctor during the blood taking procedure. Performing throat and nasopharyngeal swabs are technically more difficult in paediatric patient and may sometimes require more than one healthcare provider to be fully gowned up in the room to assist the procedure. The Malaysian protocol states that the cases would be considered negative if two consecutive swabs are negative. However, some of the throat and nasopharyngeal swabs that were positive in Case 1 and Case 4 turned negative in testing and later reverted to positive

[Table 2]. The early negative results were likely false negatives from sampling error due to difficulty in obtaining respiratory specimens from this age group. It may be necessary to have three consecutive negative swabs before considering the patient to be fully recovered. The RT-PCR cycle threshold [CT} value gives an estimate of the viral load where the lower the CT value, the higher the viral load (Wishaupt et al., 2017). However, the relationship between viral load and disease severity is still uncertain and under research. Presently RT-PCR Ct values are not used in the clinical management of COVID-19.

There has been an expert consensus statement from China on the diagnosis, treatment and prevention of COVID-19 on the 7th of February 2020 (Shen et al., 2020). Most of the measures taken in these 4 cases agreed with the statement except for traditional treatments that were not used in our hospitals. We aimed to share the findings of the 4 cases in order to highlight the relatively mild symptoms of COVID-19 in children and the difficulties encountered in the care of paediatric patient affected by the illness.

Conflict of interest

None.

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None.

Ethical approval

This short communication has obtained the permission to publish by the Director General of Health, Ministry of Health, Malaysia.

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