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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Editorial

COVID-19 changed times shaping the future

Reflecting on the first 100 days since the COVID-19 Pandemic was declared, it has become apparent that the impact across the globe has been dramatic. In this issue of *Paediatric Respiratory Reviews*, we present a series of papers dedicated to examining the impact of COVID-19 on the health and wellbeing of children and families, both now and into the near future.

The first wave has spread from China to Europe, North America and the Asia Pacific regions whilst a more frightening picture of its impact is evolving in Brazil, Indonesia and other Low-Middle Income Countries (LMIC) [1,2]. At this time, there have been 8.5 million cases and 454,000 deaths reported [www.who.int; accessed June 19, 2020]. The deaths have been highest in the United States with 118,000, Brazil 48,000 and the United Kingdom 42,000; although data suggest that deaths from COVID-19 are most likely underreported. When high income countries such as the USA figure so prominently in this tally, based upon past experience with common influenza peaks, questions will no doubt be asked of the current political leadership, preparedness and the willingness to respond promptly to experienced senior health advisors in the name of political expediency [3]. The ramifications will go beyond concerns of the potential for a "Second wave" of cases with easing of lockdown restrictions [4].

The role of modelling of potential healthcare outcomes in pandemics has proven valuable in guiding decision makers in their response to the COVID-9 pandemic. In the first of two papers on modelling, McBryde and colleagues highlight the importance of tracking the impact of distancing and movement policies and behaviour changes in people which is critical in evaluating early decisions made in responding to the COVID-19 pandemic [5]. In this article they emphasise the contribution that modelling will make for evaluation of the pathways to safely relax mobility restrictions and distancing measures. Further, they discuss how models can consider future end-game scenarios, including how suppression can be achieved and the impact of different vaccination strategies.

Children are resilient and this is important to remember. Whilst children have represented <4% of cases and mercifully been spared from many of the acute complications of SARS-CoV-2 infection, they have had to endure many changes in routine, social interactions, education and access to basic healthcare [6]. This was evident when the initial spread extended from China to Europe courtesy of international airline travel [7]. The first sizeable assessment of COVID-19 on children in China was encouraging [8]. This has been expanded upon in the paper by Delores De Luca and colleagues from Italy, where the first European epicentre occurred [9]. In this paper, there is a detailed description of the responses in children of different ages to COVID-19. The paper highlights the regional nature of the outbreak, largely confined to the North of Italy, the coordinated regional government response, and the confirms again, the relative sparing of children and young adults. Extending this clinical experience is the paper by Carroll and colleagues which discusses the effects of COVID-19 across Europe where the disease has followed clearly differing trajectories, with the disease extent in Austria and Germany differing greatly from Italy, Spain and the United Kingdom [10]. The experience from three centres in the USA follows with again differing perspectives from Seattle, New York and New Orleans [11]. In this paper, the emphasis rests upon common challenges with resource allocation, repurposing of paediatric resources and personnel, as well as opportunities arising for collaboration and preparedness for future healthcare crises.

The differing experience across the Asia Pacific region could not be made more stark as reported by Fitzgerald and Wong [12]. From the initial cases in Dec 2019 in China came fears of a wave of similar severity across those countries with close geographical and cultural ties, such as Taiwan, Vietnam, Japan, and Korea as well as those with strong economic ties such as Singapore, India, Australia, and New Zealand. Many of these fears fortunately did not eventuate and the authors discuss the benefits of geographic isolation and definitive political action in closing borders. The willingness of political leaders to act decisively in democratic nations, work collaboratively on a well integrated national platform and communicate with the population and be accountable to them are illustrated in the success in countries such as New Zealand and Australia. As the first wave has reached LMIC, Zar and colleagues highlight the immediate challenges of dealing with COVID-19 in resource limited settings and the greater implications of disruptions to healthcare programmes for vaccine preventable diseases such as measles and polio [13]. The papers are consistent in highlighting the lessons learnt including a lack of preparedness for the COVID-19 pandemic despite recent experience on a smaller scale with SARS and MERS, a lack of action at decisive moments and the worrying partisan relationships between the WHO and high income countries which have undermined its ability to respond to such health crises and unite the world in its response. The consequences of this continue to emerge and have no doubt contributed to the lives lost to COVD-19.

The impact upon families involves not only individual members but the unit as a whole. In medical consultations, questions are asked by parents about COVID-19 and safety of attending daycare, schooling and co-morbidities such as asthma or lung disease in cystic fibrosis. Fortunately, the impact of COVID-19 is mainly

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modest and this note of reassurance is evident in the paper by Robinson and colleagues from Canada where they discuss "what the paediatrician needs to know" [14]. This useful guide summarises key points of what is known to date about how children may fare in relation to the risks of COVID-19 infection. Expanding upon this is the paper by Rozycki and Kotecha about the impact of COVID-19 on pregnant women and newborn infants [15]. The article nicely summarises the limited data available from the cases reported to date and offers the clinician a balanced summary of the literature and advice for pregnant women and families. Considering the broader implications of the universal policies regarding physical distancing, Fitzgerald, Nunn and Isaacs present an overview of the health, psychosocial and economic implications of this important initiative upon the family unit [16]. They discuss the evolution of physical distancing from lessons learnt in the USA with Spanish Influenza pandemic from a century ago and juxtapose this with the presumed longer-term benefits and costs of physical distancing in current times.

When looking to the future, we must be aware of the opportunities to learn from our current experience, taking note of the use of technological advances and innovative research into COVID-19 and its manifestations. Our emerging understanding of some of the more sinister complications of COVID-19 with its thrombo-inflammatory nature is examined in a comprehensive review by Mitchell [17]. Here the immunological drivers of inflammation are reviewed and potential interventions for attenuating this are discussed. Similarly, our understanding of Immunology is one of the obvious beneficiaries of technological advances which have enabled scientists to break the genetic code of SARS-CoV-2, attempt to define its infective mechanisms and work to block these with a novel vaccine. This is reviewed by Koirala and colleagues as they examine the current leading candidates in the quest for a COVID-19 vaccine [18]. The need to improvise in the sourcing of ventilators, and guidelines for rapidly developing relatively inexpensive and simpler to operate but effective support devices is discussed in the paper by Pons and colleagues [19]. The ability to develop and test new technology in an atypical context is highlighted as well as the need for more integrated international development and the relevance of inexpensive ventilators becoming available in LMIC, where at present the reality is that little more than a finite supply of supplemental oxygen can be offered for respiratory support. On both a global scale and a local scale, the importance of modelling to support public health initiatives is apparent. The utility of modelling to inform policy development beyond COVID-19 is presented in the second paper by Meehan and colleagues [20]. The broader implications of this information for entwined health and economic welfare of economies are considered. Finally, as clinicians we are aware that telehealth has had a dramatic influence on consultations. In a timely review, Wijesooriya and colleagues discuss how the communication landscape has changed for medical consultations, research, and medical education with its upsides and potential limitations [21]. Much will change in practice and it is up to all of us to make it work well, whatever final shape it takes. The key challenge for all involved in healthcare is to translate the knowledge gained into healthcare benefits for all in our societies across the world.

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