As the coronavirus disease 2019 (COVID-19) pandemic struck the entire world, our health systems, global economy, and humanity have been put to a test that was never seen before. By September 1, 2020 when this article was submitted, COVID-19 has infected over 25 million people worldwide, and resulted in a total mortality of more than 856,555 (https://covid19.who.int). The actions taken by global medical professionals, health agencies and organizations, governments, etc., can directly impact the health, safety, and wellbeing of our lives, including lives of our most vulnerable population, children. In order to share information and experiences in combating COVID-19 pandemic, the 2020 GPPA Forum on COVID-19, jointly organized by the Global Pediatric Pulmonology Alliance (GPPA) and the China Medicine Education Association (CMEA), was held online at 14:00–22:00 Beijing time on July 17th. The Forum was presided over by Professor Kunling Shen of Beijing Children’s Hospital, Capital Medical University.

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The 2020 GPPA online Forum on COVID-19 is as of today the largest and highest-level pediatric expert forum on this subject. Over 40,700 viewers from over 22 countries/regions participated in this important meeting. In addition to President of GPPA Professor Kunling Shen, the Forum also featured Honorary President of GPPA Professor Yonghong Yang from Shenzhen Children’s Hospital, and Vice Presidents of GPPA including Professor Leyla Namazova-Baranova, President of Russian Federation Pediatric Society; Professor Lanny Rosenwasser, a Past President of World Allergy Organization (WAO); and Professor Gary Wong, President of Asia-Pacific Academy of Pediatric Allergy, Respirology and Immunology (APAPARI). These global clinical leaders attended the Forum and delivered welcome speeches respectively.

In her welcome speech, Professor Shen analyzed the current global epidemic situation and its impact on pediatric population. She noted that as the pioneer of epidemic prevention and control, Chinese pediatricians and nurses on the front-line have made, and is still making, courageous contributions and sacrifices. Their bravery, compassion, and excellence in clinical knowledge and skills helped protect the lives and health of numerous children. The GPPA Forum was a tribute to all those who demonstrated their courage, caring and cure throughout China and beyond.

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In order to better guide the work of pediatric COVID-19 prevention and control, the Chinese pediatric leadership has held multiple domestic and international online meetings to share information and experiences with colleagues domestically as well as internationally, which in timely manner, contributed to the fight against COVID-19 in China and around the world. She pointed out that in the month of February Chinese pediatrics experts had held 10 sessions of national pediatric Grand Rounds, which reached more than 100,000 online viewers in total.

At the meantime, in January and March, Chinese pediatric leaders and experts released two editions of expert consensus on the diagnosis, treatment, and prevention of COVID-19 in children in the *World Journal of Pediatrics*. In March, an article written by Chinese pediatricians on pediatric COVID-19 infections was published in the *New England Journal of Medicine*, which was read and/or referenced by over 730,000 people worldwide.

On April 16th, a group of elite pediatric infectious diseases experts led by Professor Shen from China and Professor Bonnie Maldonado, Chair of Committee on Infectious Diseases, American Academy of Pediatrics (AAP), met online and exchanged opinions and experiences on the diagnosis and treatment of pediatric COVID-19. The meeting was coordinated by Professor Lance Rodewald from Chinese Center for Disease Control and Prevention (CDC). On April 23rd, Chinese pediatric leaders held an online China-Asia webinar on COVID-19, attended by experts from 15 countries including China, South Korea, Japan, Singapore, the Philippines, Australia, India, Malaysia, Indonesia, Vietnam, Thailand, the United States, France, the United Kingdom and the United Arab Emirates.

GPPA Honorary President Professor Yonghong Yang, Vice Presidents Professor Nomazova-Baranova, Professor Lanny Rosenwasser, and Professor Gary Wong voiced their recognition of what had been accomplished in China, and the fact that Chinese pediatricians’ efforts not only helped winning the battle against COVID-19 at home, but also contributing to the global movement by sharing their invaluable experiences with fellow physicians around the world.

After the welcome speeches from GPPA leadership, the Forum kicked off its scientific program, which was divided into Asia and Europe/America sessions. In each session, lectures were given by top pediatric leaders and clinical experts around the world.

**Asia Session**

Professor Kunling Shen kicked off the Asia Session by giving a speech on “Progress on basic and clinical research of interferon (IFN) against COVID-19”. She pointed out that Type I IFN is major antiviral cytokine and IFN-α1b is the first class I IFN new preparation developed via gene engineering technique in China. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) reduces IFN expression, which suggests exogenous IFN is a remedial way for treatment of COVID-19. *In vitro* experimental studies showed type I IFN, especially IFN-α1b, effectively inhibits SARS-CoV-2. Nebulized type I IFN showed therapeutic and prophylactic effects against COVID-19 in several exploratory clinical studies. She noted that the relation between IFN-α treatment and cytokine storm is to be further studied.

IFN stimulate SARS-CoV-2 receptor angiotensin-converting enzyme 2 (ACE2) expression, and whether increased ACE2 expression is beneficial to COVID-19 patients remains to be further studied. She concluded that nebulized IFN-α1b is a promising treatment for COVID-19, but large-scale randomized clinical trial is needed.

Professor Lance Rodewald, Senior Advisor of China CDC, spoke on “From evidence to recommendations – considerations for COVID-19 vaccination policy”. Professor Rodewald pointed out that COVID-19 vaccines
meet or exceed the World Health Organization (WHO) target product profile would be suitable for all ages; having 50%–70% efficacy; causing no serious adverse events—are highly likely to be successfully developed. Although key characteristics of the emerging vaccines are unknown—especially duration of protection—it is reasonable to expect that these vaccines will be able to protect individuals at risk of infection and complications, help stop outbreaks, and contribute to achievement of community-level protection. Vaccines will protect children and children’s close contacts. Pediatricians should pay close attention to COVID-19 vaccine developments and policy. Global collaboration is essential.

Professor Gary Wong of Hong Kong, China, discussed “SARS-CoV-2 infection in children—the biology of a milder spectrum of disease”. Professor Wong’s lecture advised that most infected children have a mild clinical course and recover uneventfully. Screening of children/adolescents with household contacts, and diagnosis and isolation of asymptomatic or mild symptomatic children/young adults may be important for stopping the chain of transmission. Watch out for children with comorbid conditions and infants at risk for severe disease. He also explained atypical symptoms—gastrointestinal symptoms only, e.g. intussusception, multisystem inflammatory syndrome. He concluded that clear understanding the immune responses in infected children and adults would shine light into the development of effective treatments and vaccine for COVID-19.

Professor Anne Goh of Singapore, told the audience about “Singapore’s COVID-19 epidemiology and country response strategies”. Professor Goh noted that infection in children in Singapore was low with most being either asymptomatic or had mild upper respiratory tract infection. Most of the infections were acquired through household contacts or travel from a country with high infection rates. Singapore implemented a semi-lockdown state where school was home-based and individuals worked at home except for essential services. Singapore is now in phased re-opening to enable life to go back to some normalcy. The main measures for a safe re-opening include:

1) Use of face mask or face shields at all times except when at home;
2) Maintain safe distancing;
3) Maintain good personal hygiene;
4) Effective contact tracing;
5) Active community surveillance and testing to pick up early clusters.

Professor Jiuyao Wang of Taiwan, China, spoke on “COVID-19 and asthma, lucky or unlucky?” He analyzed data and studies on the prevalence of asthma in patients with COVID-19. It is unclear if people with asthma are at increased risk of contracting COVID-19 or of worse outcomes from COVID-19 infection. The evidence available is limited with some sources suggesting an underrepresentation of asthmatic patients in hospitalized cases, and others showing an increased risk of worse outcomes in patients with asthma which may be associated with disease severity. Consensus broadly holds that asthma medications should be continued as usual. Asthma care may be disrupted during the pandemic; self-management and remote interventions may be of benefit but have not been tested in this context.

Professor Xiaoxia Lu of Wuhan, China, shared “Clinical features of COVID-19 in children”. Professor Lu pointed out that, based on experiences obtained in Wuhan Children’s Hospital:

1) Children of all age groups can be infected. Most children acquired the virus via household contact with family members whose symptoms developed earlier.
2) The disease typically has an acute onset, with early symptoms that include fever, fatigue, and dry cough. A few patients and neonatal cases may have atypical symptoms.
3) The clinical manifestations of most children are relatively mild, and they usually recover within 1 to 2 weeks.
4) Severe cases may gradually develop chest distress and dyspnea, quickly progress to acute respiratory distress syndrome (ARDS), septic shock, metabolic acidosis, bleeding, coagulation dysfunction and multiple organ failure.

Professor Kunling Shen of Beijing, China, spoke on “The prevention and control strategies of influenza under COVID-19”. She reiterated that prevention and early diagnosis are important measures as COVID-19 meets influenza. With the next flu season coming up, how to control and minimize risks caused by both COVID-19 and influenza will be a new challenge for all nations and their clinicians. GPPA is in the process of developing a Recommendation Paper on this topic.

Professor Ling Cao of Beijing, China, discussed “To avoid COVID-19 and flu pandemic, the importance of recommending flu vaccine for children”. The COVID-19 pandemic may persist for a long period of time. Global prevention and control become a complex and challenging task. During this period, the prevention of influenza through vaccination is a key focus especially in the upcoming autumn and winter seasons for the medical field worldwide. It is important to improve influenza vaccination include promoting public awareness through education of the benefit of influenza vaccination. The ultimate goal is to achieve early notification, early appointment and early vaccination, which will help reduce an influenza and COVID-19 superimposed epidemic this winter. It is recommended that vaccination policy, vaccine safety and medical advices be promoted and reiterated in child care centers, kindergartens and schools.
Europe/America/Oceania Session

Professor Leyla Namazova-Baranova of Russia, talked about “COVID-19 among Russian children: country lessons”. In her speech, Professor Namazova-Baranova introduced research data and findings on Russian children. On the COVID-19 and hyposmia/anosmia side, she concluded that children and adolescents retain changes in their sense of smell and taste sensitivity for another 3 weeks after recovering from COVID-19 infection. Moreover, these changes are expressed more often than children and their parents are informed about it at the infection time. Finally, involvement into the pathological process of olfactory sensitivity does not depend on the severity of the infection itself or premorbid neurological damage. On the COVID-19 and comorbidities (allergy and asthma) side, she concluded that lockdown, social distance during the COVID-19 pandemic, good adherence to basic therapy in the group of children with asthma, had a positive impact and led to a decrease in the number of respiratory infections, exacerbations of asthma, improved disease control. In children with severe asthma, no significant changes in asthma activity during pandemic were observed. Children with asthma and allergy are not likely to be at high risk for a new coronavirus infection, nor are healthy children. She advised that further monitoring of patients with asthma and other allergic diseases during the COVID-19 pandemic is necessary.

Professor Eitan Kerem of Israel spoke on “Children under and after the lock-down”. Professor Kerem stated that in response to the COVID-19 outbreak, and to prevent spreading of the infection, governments have ordered a nationwide school closure. School closures have led to 1.5 billion school-age children and adolescents being homebound. Prolonged home confinement during a disease outbreak might have negative effects on children’s physical and mental health. Children that are out of school are physically less active, have much longer screen time, irregular sleep patterns, and less favorable diets which result in uncontrolled weight gain and loss of fitness. In addition, they may present late to the hospital for emergency of chronic care; they are more exposed to domestic violence and more suffer from sexual abuse. Attention should be given to their emotional needs. They experience more fear, stress and social isolation. Reports from previous lock-down events found that 30% of isolated or quarantined children demonstrated posttraumatic stress disorder (PTSD) symptoms. A clear association between loneliness and mental health problems in children and adolescents with the strongest association was with subsequent depression. To prevent all these, action should be taken in the national leadership level to raise the awareness and suggest means of prevention of potential physical and mental health impacts of home confinement. Most COVID-19 infected children have mild clinical manifestations; however, long term symptoms may develop after the pandemic is over.

Professor Chris O’Callaghan of the United Kingdom, lectured on “Transmission and the earliest stages of infection”. Many countries have been slow to appreciate the likelihood that SARS-CoV-2 can be transmitted by both large and small aerosol particles. It is likely certain individuals will produce much larger amounts of aerosolized virus than others. The wearing of face masks will help reduce aerosol generation and surface contamination and afford increased protection alongside social distancing, hand washing and eye protection. Further research is needed to determine risks, for example, we have shown infants with bronchiolitis produce infectious aerosols of RSV that can remain airborne for at least two hours after patients have left their cubicles.

Professor Bernard Kinane of U.S., spoke on “Biological and immunologic differences between adults and pediatric patients”. Professor Kinane noted that the difference in morbidity and mortality between adult and pediatric patients with COVID-19 infections is readily apparent. This is likely to reflect two core aspects; risk factors that only occur in the older population and an aging immune system. Comorbidities that are associated with a poor outcome include age greater than 75, diabetes, hypertension, coronary artery disease, and obesity. As these occur mostly in the older adult population, much of the mortality is confined to this group. With the aging immune system, there is more macrophage activation, less interferon production, and less focused B cell and T cell responses. The differential immune responses between adults and children is likely to contribute to the morbidity and mortality.

Professor Basil Elnazir of Ireland, presented on “Pediatric telemedicine and COVID-19; virtually ideal!” COVID-19 has acted as an accelerator for digital health implementation in different jurisdictions during the pandemic. We presented different examples of how implementation of telemedicine has impacted the care for children with respiratory disorders. This was an opportune timing as there was huge reluctance from parents to present their children with chronic respiratory conditions such as asthma and cystic fibrosis to hospitals for fear of cross infection. The four main areas discussed were the diagnostic, predictive, adaptive and preventative utility of telemedicine in a pediatric respiratory service. The role of remote monitoring with objective serial measurement of data points was also highlighted. Future technology, digital medicine and artificial intelligence will not alter clinical practice fundamentally but will compliment and change how we deliver clinical care to our patients; this will obviously have to be adapted to local resources and needs. There is also an urgent need for high quality studies to determine patient and physician satisfaction and the quality and effectiveness of clinical care delivered.
At the end of the Forum, Professor Kunling Shen, on behalf of GPPA, put forward a Recommendation Paper on influenza vaccination under the COVID-19 pandemic. Due to the COVID-19 situation worldwide, vaccination programs have been impacted significantly. Meanwhile, the possible co-infection of COVID-19 and influenza in the coming winter will pose concerning risks to not only child population worldwide, but also the capacity of national health systems, and the capacity of hospital-level diagnosis, treatment, and critical care. In order to promote public awareness and pro-active actions, the GPPA developed and put forth a Recommendation Paper based on evidences as well as best-practices in various countries/regions in the fight against COVID-19. It is suggested that all global organizations, medical societies and health agencies join hands in the prevention of seasonal influenza in children. Measures to improve influenza vaccination include promoting public awareness through education of the benefit of influenza vaccination. The ultimate goal is to achieve early notification, early appointment and early vaccination, which will help reduce an influenza and COVID-19 superimposed epidemic in the winter. It is recommended that vaccination policy, vaccine safety and medical advices be promoted and reiterated in child care centers, kindergartens and schools. Countries and regions with ample resources should implement free influenza vaccination in child care centers, kindergartens and schools, so as to increase the coverage rate of influenza vaccination among pediatric population. The GPPA Recommendation also puts forward specific suggestions on the vaccination strategy, schedules, methods, and precautions for influenza vaccine under COVID-19. Under the COVID-19 pandemic, getting the influenza vaccine in time can help give children a safer winter and a healthier future.

The GPPA Forum was made available free of charge for all the 40 760 participants from 22 countries and regions. Many participants expressed their appreciation for such a high-level yet no-cost medical education opportunity, to learn from top pediatricians from other countries via an online platform. The international speakers/chairs team presented an interesting, informational, and international-standard educational program that would undoubtedly benefit pediatricians, and the patients they provide care worldwide. What they have learned will help not only battle the current COVID-19 situation, but also challenges ahead in the upcoming influenza season. The GPPA Forum is a successful meeting. It is also a small platform to demonstrate the great vision that Mankind Is a Community with Shared Future. COVID-19 has no borders, and neither should pediatricians. In this light, we must realize it is only through unity, compassion, and courage of all nations, that humanity will prevail over this deadly virus.

In her closing statement, Professor Shen noted: “Due to the impact of the COVID-19 pandemic, there are fewer opportunities now for pediatricians from all over the world to meet in person as we did in the past. However, modern technology provides us with new platforms for learning, communication, and collaboration. COVID-19 has changed our lives. However, the advancement of global pediatrics is unstoppable, and the determination and efforts of pediatricians to protect children’s health are unstoppable. Through the GPPA Forum, we shared our experiences and lessons from the past few months with medical colleagues from 22 countries and regions around the world. We learn, we share, we unite, and we will do everything in our power to protect our most valuable legacy, our children.”

**CONFLICT OF INTEREST**

None.

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