

## EDITORIAL

## The subspecialty of Paediatric Virology: A 'mosaic tile' in future Paediatrics

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Paediatrics [ $\langle$ παις (pais=child) + 'ιάομαι/ιῶμαι' (iaome/iome=healing)] is the science and the art of treating infants, children and adolescents, supporting their health, growth and development and ensuring their opportunity to achieve full potential in adulthood (1). As a stimulating, diverse and hugely rewarding medical specialty, it manages a wide range of medical conditions, diseases and disorders, which affect the paediatric population. For this reason, Paediatrics is a broad-based specialty, allowing paediatric health professionals to be either based in the community - evaluating, monitoring and coordinating paediatric patients and their parents - or to become subspecialised in certain areas of interest (2). Paediatric subspecialties, including Paediatric Infectious Diseases, constitute a modern trend in Paediatrics. The medical school settings, as well as the tertiary hospitals, have been specified as the main employment sites of paediatric subspecialists (3). Factors influencing subspecialty choice by paediatric trainees include what is valued by them and excessively vary in certain subspecialties (4).

Since our proposal on Saturday the 10th of October, 2015 (5), Paediatric Virology has attracted the critical interest of several worldwide experts in the scientific fields of Neonatology, Paediatrics, Paediatric Infectious Diseases and Virology (Fig. 1). These experts have been asked by members of the Paediatric Virology Study Group (PVSG) and have enthusiastically offered their valuable input on the debate of the potential role of Paediatric Virology as a new paediatric subspecialty. Although this debate has already tagged difficulties, challenges and limitations on this proposal,

the potential value of Paediatric Virology subspecialists has undoubtedly been accepted. Nevertheless, our purpose is not to cause a destructive revolution on the existing educational platforms and training programmes on Paediatric Infectious Diseases (6), but to create and add a tiny 'mosaic tile' in future Paediatrics.

Mosaic [see Fig. 1 in Mammas and Spandidos (7)] is an artwork technique of creating images with tiny pieces of coloured tiles made of rock, wood, glass or other, usually colourful materials. The ancient Greek origin of mosaic, 'ψηφιδωτό' (psefidoto), comes from the ancient Greek noun 'ψηφίς' (psefis), meaning the tiny 'mosaic tile'. Interestingly, the final picture in a mosaic is tried - and in most cases is achieved - to be superior to its 'tile' components. Similarly, the Paediatric Virology 'tile' should definitely aim to enhance and highlight the wonderful 'mosaic' of Paediatrics, enriching Paediatrics with newly acquired knowledge from Virology, Epidemiology, Molecular Medicine, Evidence-based Medicine, Clinical Governance, Quality Improvement, Pharmacology and Immunology (8). Our efforts have to be interpreted as an attempt to find the incentives to enhance and promote the workforce of this subspecialty. These incentives are what will be valued in the future by our little patients and their parents.

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#### WORLDWIDE EXPERTS IN NEONATOLOGY AND PAEDIATRICS



Professor Anne Greenough, MD, FRCPCH  
Professor of Neonatology and Clinical  
Respiratory Physiology, Vice President of  
Science and Research at the Royal College  
of Paediatrics and Child Health (RCPCH),  
King's College London, London (UK)

'Paediatric Virology is indeed a rapidly increasing educational challenge. Our ability to prevent and treat viral infections is really emerging. For example, many new potential vaccines, antiviral agents and monoclonal antibodies are on the way and new therapies against viral infections, such as RSV, rhinovirus and metapneumovirus infections, will follow. The number of Paediatric Virologists in any one country is likely to be small, hence a separate paediatric subspecialty needs to be considered carefully, as some trainees may not be able to progress to a Consultant position.'

(Workshop on Paediatric Virology, Athens, 2015)



Professor Michael Weindling, MD,  
FRCPCH  
Professor of Perinatal Medicine, Consultant  
Neonatologist, University of Liverpool,  
Liverpool (UK)

'It is certainly beneficial of all paediatricians to have a good knowledge of Virology - the two recent health crises, Ebola and Zika, are clear examples. I could see how for most trainees a module or series of lectures in Pediatric Infectious Diseases would be helpful as part of their training. For some, a higher diploma or Masters degree might be appropriate. For a very few, I could see how specialising in Paediatric Virology could be really interesting. However, this would be highly specialised and the specialist skills and knowledge are exemplified by the remarkable speed with which a possible vaccine to the pika virus has been taken to a preliminary trial phase.'

(personal communication)

#### WORLDWIDE EXPERTS IN PAEDIATRIC INFECTIOUS DISEASES



Professor Gail J. Demmler - Harrison, MD  
Professor of Pediatric Infectious Diseases,  
Baylor Department of Pediatrics and  
Pathology & Immunology, Baylor College  
of Medicine, Houston (USA)

'Pediatric Virology can encompass not only laboratory diagnostics, but also antiviral treatment programs and antiviral research programs for diagnostics and treatments, as well as basic science, and epidemiology studies. The idea of a Pediatric Virology training is thought leading. Perhaps Pediatric Virology could first be recognized as a sub- or super subspecialty of Pediatric Infectious Diseases, or a special competency or certification, where doctors with a subspecialty in Pediatric Infectious Diseases then concentrates on Pediatric Virology, with a focus on Clinical Virology in the patient, Epidemiology of viral infections in Pediatrics, including emerging and endemic viruses and viruses that affect the fetus and newborn, laboratory-based diagnostics both molecular and traditional (virologic and serologic), and antiviral treatments, and also possibly antiviral prevention methods such as vaccines and biologics. There are no specialized Board of certification exams for Pediatric Virology. Perhaps you could work towards that first, a special international or national certification. Alternatively, it could begin to be its own subspecialty, but I think that would be more difficult to train specialists without first being part of an already established subspecialty, before you branch out into being your own subspecialty. I think it would move the field forward more quickly and bring more attention scientifically to viral diseases.'

(personal communication)



Professor Danielle M. Zerr, MD, MPH  
Professor of Pediatric Infectious Diseases,  
Seattle Children's Hospital, University of  
Washington, Seattle (USA)

'It's hard for me to believe that there would be adequate clinical demand to support a new specialty. Thus, I would be concerned about going this direction. I believe training in Molecular Virology is very important for Infectious Diseases specialists.'

(personal communication)



Professor Maria Theodoridou, MD, PhD  
Emeritus Professor of Paediatric Infectious  
Diseases, President of the Hellenic  
Paediatric Infectious Diseases Society,  
'Aghia Sophia' Children's Hospital,  
University of Athens, Athens (Greece)

'Training on the prevention, management and treatment of neonatal and paediatric viral infections represents a new educational challenge for both community as well as hospital-based paediatric health professionals. Due to the current advances on the recently re-defined scientific field of Paediatric Virology, this requires a state-of-the-art continuous medical education on viral infections provided by both clinicians and basic scientists. The debate of the potential strategically principal role of Paediatric Virology subspecialists in the primary, secondary and tertiary clinical practice is definitely necessary and needs further discussion and evaluation. In the future, it is important to determine whether and how Paediatric Virology as a new paediatric subspecialty can indeed help paediatric clinical practice allowing the development of accredited training programmes by tertiary Pediatric Infectious Diseases centers able to attract the highest quality paediatric trainees.'

(Workshop on Paediatric Virology, Athens, 2015)

#### WORLDWIDE EXPERTS IN VIROLOGY



Harold zur Hausen, MD, DSc (Hon), MDs (Hon)  
Emeritus Professor of Virology, German  
Cancer Research Center, University of  
Heidelberg, Heidelberg (Germany)

'I am not so sure whether Pediatric Virology should be established as a separate paediatric subspecialty, although obviously infectious diseases play a significant role in Pediatrics. Since those types of infectious diseases must be an everyday problem in the pediatric practice, I do not feel that a separation from other areas would be very useful.'

(personal communication)



Professor Anna Kramvis, BSc (Hon), PhD  
Professor of Virology, Hepatitis Virus  
Diversity Research Programme, University  
of the Witwatersrand, Johannesburg (South  
Africa)

'Paediatric Virology is a field that is increasing exponentially. The advances in Molecular Virology, the new treatments that are available as well as the unprecedented human migrations, we are experiencing at present, mean that the field is growing in a number of directions: Molecular Biology, Pharmaceutics and Epidemiology. Added to this we also have the emergence of new or previously unrecognized viral infections, as for example, Zika virus, H5N6 influenza virus, Ebola virus, new HIV outbreaks, just to mention a few. I think that the recognition of Paediatric Virology as a subspecialty will allow this area that is often neglected to grow and research in this field to be supported. The paediatric population is probably our most vulnerable age group and our future. Therefore, it is important that their health is prioritized. Paediatric Virology as a subspecialty will allow for an understanding of this field, as well as research in areas, which would benefit this age group. Often the drugs that are available for adults cannot be used in the paediatric population and these have to be customized for the paediatric population. Although vaccines are available for many childhood viral infections, often the political will is not available to allow optimum implementation and coverage of the vaccination in many resource-limited environments.'

(Workshop on Paediatric Virology, Athens, 2015)

Figure 1. Opinions by 7 worldwide experts on Neonatology, Paediatrics, Paediatric Infectious Diseases and Virology, on the debate 'Paediatric Virology as a new paediatric subspecialty', recorded by the Paediatric Virology Study Group (PVSG).

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