

## As Few Pediatricians as Possible and as Many Pediatricians as Necessary?

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**A** common mantra is “as little as possible and as much as necessary.” This perception can be applied to all kinds of different projects in everyday life in order to help achieve a good outcome. It also applies to medicine, for example, “as little antibiotics as possible and as much/many antibiotics as necessary.” However, does this “rule” also apply to the pediatric workforce, that is, “as few pediatricians as possible and as many pediatricians as necessary”? How can we develop a sustainable pediatric workforce to meet the healthcare needs of children? We previously offered different equations for calculating the needed numbers of annually trained pediatricians to keep the actual number of pediatricians in a country stable in view of variable working conditions such as full-time or part-time working equivalents<sup>1,2</sup> and weekly working hours and night shifts.<sup>3</sup> We now describe pediatric workforces in 2013-2018 in 16 European countries, 11 European Union and 5 non-European Union countries.

National child healthcare systems are embedded in the underlying political and economic systems such as capitalistic, liberal, monarchic, socialistic, or social market system. National pediatric workforces can be analyzed according to the triangle of need–supply–demand. Our analysis neither intended to compare national pediatric workforces with the underlying political systems nor did it investigate the role of different types of health insurance systems, for example, financed by levies to insurance funds (Bismarck system) or by taxes (Beveridge system). We also tried to avoid a single-sided view of pediatricians whose understandable aim is to defend their own needs and to improve working conditions. Instead, we wanted to look at the child healthcare services through the eyes of families and their children. The priority of families is to have an available, adequate/appropriate, affordable, and easily accessible healthcare service provided by highly qualified personnel on all levels ranging from generalists to specialists. Families wish to have a well-functioning and competent child healthcare system that—if fragmented—should be well-coordinated. Different bodies and institutions involved in the care of children should communicate and cooperate well, reaching a consensus whenever and whenever possible.

### Human Resource Planning in Pediatrics

The factors that must be taken into account in the process of calculating the pediatric workforce include geography, population density, transport links, relationship between child health centers, political readiness for change, and cooperation between different types of clinicians. Critical to the discussion is the number of children requiring community care, hospital care, and public healthcare by pediatricians to adapt the different competences of pediatrics to the needs of young patients and their families.

### Results of a Survey on National Pediatric Workforce in 2013-2018

Responses to a questionnaire on national pediatric workforce were received from pediatricians (see author list) of 16 European countries and subsequently analyzed (data on individual countries will be published in an upcoming European Paediatric Association article). Results were also compared for the 3 subgroups of child healthcare systems as described by Katz et al<sup>4</sup> and the World Health Organization<sup>5</sup>: pediatric system = 6 countries (Croatia, Czech Republic, Germany, Israel, Russia, Spain), mixed care system = 6 countries (Armenia, Austria, France, Italy, Switzerland, Turkey), and general practitioner system = 4 countries (Bulgaria, Ireland, The Netherlands, Romania). In the 16 countries there were 95 559 853 children <14 years of age and the total number of pediatricians was 116 840, a ratio of 818:1. The mean percentage of primary care pediatricians was 41%; hospital pediatricians equaled 56%, and other types of pediatricians 3% (eg, working in public healthcare services). The mean proportion of trained and accredited pediatric subspecialists was 27%. The median of lifelong working years was 36 years. The median percentage of pediatricians working part time equivalents was 17%; 71% were female and the mean percentage of female pediatricians

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currently in training was 76%. Eight countries reported an increase of pediatricians from 2013 to 2018 ranging from 1% to 10%; 5 countries reported no change and 2 a decrease. No data were available for 1 country. In 6 of the 16 countries, the number of pediatricians leaving the national workforce and migrating exceeded the number of immigrating physicians; in 3 countries there was an equal balance of incoming and outgoing pediatricians, and there was a surplus of immigrating physicians in 5 countries; no data were available for 2 countries. Data on the influence of new medical technologies or increasing multidisciplinary care by other caregivers than pediatricians on the numbers of pediatricians were unknown. The annual number of active pediatricians leaving child healthcare services for other professions was negligible in all but 1 of the 16 countries.

From 2013 to 2018, the mean number of annually trained pediatricians per country was 319. In 2018, there will be 347 trainees, reflecting the accuracy of the equations used when compared with 339 as predicted by using our previously published equations.<sup>1,2</sup> In 2013, the presidents of national pediatric societies had been asked to predict the future numbers of pediatricians in their countries. Eight of the 16 presidents correctly predicted the number of pediatricians.

The median ratio of children <14 years per pediatrician in 6 countries with a pediatric system was 722:1. This ratio was 1342:1 for primary care pediatricians and 1446:1 for hospital pediatricians. When comparing the mixed care system with the pediatric system, higher numbers of children were treated by 1 pediatrician working in a mixed system, 860:1 vs 722:1 for all pediatricians, 1625:1 vs 1342:1 for primary care pediatricians, and 2540:1 vs 1446:1 for hospital pediatricians. There were no major differences between these 2 groups concerning lifelong working years of pediatricians and percentages of subspecialists, primary care pediatricians, and hospital pediatricians. Countries with the general practitioner system had the highest percentage of hospital pediatricians (90%) and subspecialists (31%), and the highest mean ratio of children per pediatrician, namely 2250:1.

## Conclusions

What is the best model for testing how to calculate the ideal number of children in the community who should be cared for by a single pediatrician? We may be naive when using the existing statistics on numbers of pediatricians of 16 European countries as indicators for solving the challenges of a highly complex service system also including other caregivers for children.

The status of the pediatric workforce in child healthcare has been discussed for several years, debating oversupply and inefficient services.<sup>6-8</sup> These debates are influenced by the widely accepted assumption that the future child population will require more pediatric and more general healthcare. The ratio of 4000 children per pediatrician that was regarded to be appropriate in the 1980s has decreased to 1400:1 in recent years.<sup>6</sup> This ongoing trend is supported by our findings from 2013 to 2018 in 16 European countries, irrespective of the underlying child healthcare system.

One of the basic questions deals with the assumption that the calculation of needed numbers of pediatricians should either be based on the supply and demand model or on estimating specific needs. Avoiding the complex and contradictory triangle of need–supply–demand for calculating an adequate pediatric workforce may lead to the general conclusion that the ideal system must be characterized by a decentralized provision of general care and treatment by the most experienced physicians whenever possible, with centralized specialization for treating rare diseases and severely ill children. From the patients' perspectives, all parts of child healthcare services should be available, affordable, and adequate. These services must be as close to home as possible.

This strategy requires a constant update of statistical data in national institutes. Moreover, good governance of federal and national ministries of health and social affairs is mandatory, as well as of health insurance companies. The joint forces of all national pediatric organizations must prepare a forum in which their representatives will speak with "one voice." Our own analyses in 16 countries discovered substantial gaps of requested data that could not be filled with documented data by different national institutions.

In our opinion, future strategies also require a mixture of centralized and subsidiary institutions being involved in a constant exchange of top-down and bottom-up decision making. This means that ministerial proposals will have to be tested by regional committees before being implemented. Regional experts must return the results of their findings, conclusions, and proposals to the central ministries to allow the adaptation of theoretical to practicable solutions. In this network solution, all pediatricians must actively collaborate and constantly strive to improve safety and outcomes. Local teams of pediatricians must organize and evaluate every day care as well as liaison with social care and 2-way communication with specialized pediatric centers. These pediatric specialist centers should not be seen as standalone institutions, but as part of a well-managed clinical network, promptly accepting the most urgent and appropriate cases for treatment and subsequently sending children back into the local system for rehabilitation after specialist care. Clinical leadership for gate-keeping and basic child healthcare resides with the community pediatrician who organizes shared care with clear patient pathways and clinical care plans, including training and joint clinics by specialized teams.

We think that most countries in Europe need more well-trained general pediatricians and pediatric subspecialists to achieve the goals of improving child healthcare on different levels. The "total is more than the sum of all single parts." By contrast, the motto "better care by fewer pediatricians" is unrealistic. Our objective is to alert healthcare officials regarding the necessity to optimize the issue of calculating the needed numbers of pediatricians in different settings and services of each national healthcare system. ■

References available at [www.jpeds.com](http://www.jpeds.com)

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