



# Conceptual Design of Future Children's Hospitals in Europe

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**UNION OF NATIONAL EUROPEAN PAEDIATRIC  
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## **EPA/UNEPSA EDITORIAL SERIES**

*A collection of articles dedicated to child health promotion and care published by EPA/UNEPSA's executive officers and independent experts.*

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## FOREWORD

*The European Paediatric Association, Union of National Paediatric Societies and Associations (EPA-UNEPSA) complies with the strategy of building bridges between and among medical and non-medical experts.*

*The aim of EPA is to educate without being limited by boundaries, across country borders, while respecting national idiosyncrasies. In the past recent years EPA-UNEPSA has brought 50 national paediatric associations and societies closer to stimulate together “learning across borders” and to start the debate on different issues of child health care ranging from psychological to medical, legal and economic topics.*

*Furthermore EPA-UNEPSA expanded on planning, performing and publishing studies on child health care services in Europe. Last but not least EPA attracted not only paediatricians but also other experts in child health care who were willing to be actively involved in projects aiming at improving child health care on a European level.*

*The aims of the European Paediatric Association are to improve the health of children and young people in Europe, and to improve the quality of health care services for children and their families in Europe.*

*Designing children’s hospitals requires new solutions for the re-organization of services, and renovating, merging, or closing old hospitals, as well as building new children’s hospitals. This book includes a three report series published originally in the Journal of Pediatrics in 2017 with the aim of opening the debate on what would be the correct Conceptual design of the future of children’s hospitals in Europe.*

*Planning, building, merging and closing hospitals are complicated tasks, which involve a large number of experts. The ultimate aim of publishing the three-article series is to further spark a debate among the key players engaged in providing efficient and effective updated care in children’s hospitals and to stimulate positive interactions among all decision makers concerning hospital care.*

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# Conceptual Design of Future Children's Hospitals in Europe: Planning, Building, Merging, and Closing Hospitals

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**D**esigning children's hospitals requires new solutions for the re-organization of services, and renovating, merging, or closing old hospitals, as well as building new children's hospitals. This article is the first of a 3-report series opening the debate on the future of children's hospitals in Europe.

## Planning of Children's Hospitals

The planners and decision makers regarding children's hospitals are heterogeneous groups of institutions and stakeholders. To remain relevant, child care in hospitals must function at the intersection of health, economy, and human rights. In our opinion, public and private sector health policies, systems, and practices have not responded sufficiently to the complexity of the social, economic, political-civil, environmental, and cultural factors that contribute to health in children's hospitals. The effective conceptual designing of future children's hospitals requires an integration of all these factors (**Table**; available at [www.jpeds.com](http://www.jpeds.com)). Another challenge in the economic analyses of children's hospitals is that child health care involves the entire life cycle with potential outcomes for 80-90 years. Interventions such as intensive care for newborns are especially challenging, where the gains will be accrued far into the future. Moreover, nobody can foresee whether future innovative interventions could make current economic analyses irrelevant.

One of the key organizational challenges of children's hospitals is the gap between clinical and administrative leadership. In 2009, a survey of the European Paediatric Association/Union of National European Paediatric Societies and Associations revealed that the heads of pediatric departments in 43% of the responding 42 European countries were not in charge of their unit's annual budget; 90% of countries affirmed that the heads of pediatric departments were regularly informed about the yearly budget, and income from inpatient and outpatient care and expenses. According to individual reporting from the presidents of national pediatric associations in Europe, the time interval of the regular exchange of information between administrators and clinical directors, the content of these conferences, and the depth of information, as well as the active role of pediatric directors in planning the budgets varied considerably between hospitals in European countries.

## Types of Children's Hospitals

A European Paediatric Association/Union of National European Paediatric Societies and Associations survey in 2009

identified 4 different types of children's hospitals in Europe: general hospitals with pediatric departments; stand-alone, independent children's hospitals; university children's hospitals; and highly specialized pediatric centers of competence and mother and child centers. Day clinics and neonatal intensive care units were found in all 4 types of hospitals. The number of all pediatric units or hospitals per country varied from a few in small countries to more than 2000 children's hospitals in Russia. Standalone children's hospitals were reported from 80% of the 46 responding countries, 21 countries having fewer than 5 standalone children's hospitals. Leading pediatricians from 22 European countries reported that the number of children's hospitals per child population and the numbers of beds showed a great variation. Unfortunately, they report the lack of a definitive database that would allow the evaluation and validation of all the underlying reasons for the different proportion of children's hospitals and hospital beds per 1 million child population.

## Building New Children's Hospitals

Several major cities in Europe have recently built new children's hospitals (eg, Dublin, Moscow, Bratislava), replacing or expanding existing structures. Some old children's hospitals had become progressively inefficient and unable to provide their communities with well-integrated and regularly updated cutting edge health care. Merging the need for healthcare efficiency with the importance of offering socially compatible physical spaces to children and their caretakers is now the leading approach in projects devoted to building new children's hospitals. Curbing costs and maintaining high quality standards in clinical care are certainly among the main aims. The architectural philosophy behind building children's hospitals extends beyond functional and aesthetics-based assessment to include considerations of ethics, social and political philosophy, and philosophical reflections on psychology and behavioral sciences.

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## Merging of Children's Hospitals

Presidents of national pediatric societies in Europe concluded during previous symposia of EUROPAEDATRICES that the trend of decreasing numbers of hospital beds for children will continue for the next decade. Various models for merging children's hospitals in urban areas were discussed. Three types of merging were identified: complete integration of 2 hospitals at 1 site and the disappearance of the other site, partial integration with common management and medical care in 2 locations, and 1 central management without full integration of hospitals thereby avoiding unnecessary overlap of functions and destructive competition. All experts agreed that a successful merger of children's hospitals depends on a number of essentials, such as substantial financial investments in the new institution, transparency of the steering committee's proceedings, and the willingness of the staff to embrace change. The advantages of merging were identified as better regional integration and supervision, achievement of more efficient organization of care, and economy by rationalizing provision of services, reducing capacity and cost, and offering more subspecialty services. The argument that size matters was put forward with the slogan, "Small is beautiful but large is more efficient." This argument may hold true for neonatal intensive care units and for highly specialized pediatric centers of competence<sup>1</sup>; however, there is a lack of evidence of this motto in relation to the organization of general children's hospitals in Europe. For example, larger neonatal intensive care units and more intense resource utilization at admission were associated with higher odds of a composite adverse outcome in very preterm infants in the Canadian Network.<sup>2</sup> We conclude that the risks of failing when trying to merge children's hospitals should not be underestimated. The underlying causes for failure are conflicts owing to different priorities of managers, clinicians, and other staff members. Among the negative factors may be the pace of decision making, because too fast may be as negative as too slow. Unintended side effects of merging processes are increases in workload for staff members, psychological stress, and uncertainties limiting integration and cooperation of staff members.

## Closure of Children's Hospitals

Reducing the number of beds in a children's hospital may prompt the question of when it will be better to close the children's hospital entirely. It is relatively easy to close the hospital if it is situated in a city where 1 or more children's hospitals are providing additional services. The decision-making process will be difficult in rural areas where the next hospital is located more than 50 kilometers away. During the various symposia of EUROPAEDATRICES it was discussed that, in these cases, it may be adequate to keep small pediatric units with 30 beds or less for the treatment of routine childhood disorders in general

hospitals to allow family-friendly access to in-patient care. This could mean a reduction of quality of care, for example, night shifts may have to be covered by nonpediatric residents, with an experienced pediatrician being only available on call outside the hospital.

We conclude that the discussion on the closure of small children's hospitals must be based on the demand to improve quality of care rather than on the wish to keep availability within an ill-defined distance between patients and hospital. There has been a shift from common to highly specialized forms of treatment. Pediatricians in small children's hospitals also want to use modern therapies and technologies, and these require special skills of pediatricians that are difficult to obtain in small institutions. We conclude that large children's hospitals attached to general hospitals and highly specialized pediatric centers of competence will continue to prosper, whereas the number of isolated standalone children's hospitals and mother and child centers will decrease because they may lack quality in child health care and economic and medical efficiency.

## Conclusions

Children's hospitals should be child friendly and safe, thus creating a "small world in itself." They must communicate with the outside world and offer a comprehensive expertise to the regional territory. Large children's hospital should provide specialist tertiary and quaternary services for children, including highly specialized equipment and access to rare procedures and clinical trials that may involve experimental treatments and procedures. Furthermore, each specialist unit should provide outreach clinics in regional centers, bringing their expertise closer to the patient, and also should be able to engage in shared care arrangements with local pediatricians working in regional pediatric units. It is conceivable that such hospital model, proposing high quality standards of safe and reliable care for all children, would become progressively the preferred alternative to standalone children's hospitals and mother and child centers. These centers may become less relevant to the population and therefore less likely to maintain any political support that may have favored their survival throughout the years, despite a likely substantial inefficiency. ■

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**Table. Recommendations for designing future children's hospitals (European Paediatric Association/Union of National European Paediatric Societies and Associations Scientific Advisory Board—working group)**

Concepts for a health economic design of children's hospitals requires:

1. Robust and valid data on the status quo and the effect of existing interventions.
2. Valid quality and outcome measures that include mortality, morbidity, and health-related quality of life and educational achievement at the end of the hospital stay.
3. A health economic framework based on child rights. Developing equity with adult services.
4. Health insurances and providers amenable to change.
5. Engagement of politicians and other stakeholders at a national and European level.

Concepts for a psychosocial design of children's hospitals requires:

1. A baby- and child-friendly healthcare model according to the terms of references of the Council of Europe.
2. Understanding the benefits of improving communication between children and caregivers.
3. Psychomental care aiming at some kind of normalcy: kindergarten, playground, story tellers, adequate media (child-friendly videos), library, visits of hospital clowns, child friendly food, interpreters, spiritual care providers, and so on.

Concepts for an environmental design of children's hospitals requires:

1. Child-friendly architecture (eg, pleasant entrance/registration/waiting zone), easy way finding and need for extra signs for children, bright corridors (normal light, friendly colors eg orange, yellow), 2-4 bed rooms, flexibility of rooms according to seasonal variation, playroom, open to family members from 8am until 8pm, etc.
2. Participation of children and adolescents, and designers and artists during the architectural planning period of hospitals.
3. Built in architectural flexibility on floors.
4. Beds allocated according to specialties' needs rather than history.

Concepts for a cultural design of children's hospitals requires:

1. Respecting child's rights, equity, and social justice. Priority given to noninvasive care, short duration of in-patient care, 24-hour presence of parents on the wards. No adult patients in same room or ward. Security (eg, guarded entry doors), safety (eg, fire alarm and emergency exits), hygiene (prevention of cross infections), air conditioning, and other measures.
2. Social and educational care: access to health educators, schooling in hospital.

Concepts for health policy designing of children's hospitals must respect the following rules:

1. An adolescent is not a young adult.
2. A school-child is not a small adolescent.
3. An infant is not a small child.
4. A neonate is not a small infant.
5. A premature newborn is a not small neonate.
6. A pediatrician is not a "small" doctor.
7. A children's hospital is not an inexpensive hospital.
8. Investing in children is a profitable enterprise for society, but not always for hospital economists.
9. Integrating child health research in hospitals will improve the outcome of care.

# Conceptual Design of Future Children's Hospitals in Europe. The Role of Public and Private Stakeholders as Transferors of New Concepts from Theory into Practice

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In part 1 of this series debating the conceptual design of future children's hospitals in Europe, we discussed the planning, building, merging and closing hospitals.<sup>1</sup> We now discuss the role of public and private stakeholders as transferors of new concepts from theory into practice.

## Profiling Children's Hospitals

Institutional public and private stakeholders have an important role in the transfer of new concepts from theory to practice to provide efficient, effective, and inclusive care to hospitalized children. In the current world of epidemiologic transition, characterized by multiple variables including changing patterns of diseases, mortality, fertility, and life expectancy, as well as by social changes, the ability of adapting to changing physical, mental, and social health dimensions and pressing economic challenges is an unavoidable prerequisite for effective and efficient healthcare management. Therefore, public and private institutional stakeholders in healthcare "markets" should be fully aware of several important aspects characterizing the evolving profile of a children's hospital.

As isolated stand-alone children's hospitals will be faced with considerable organizational and economic challenges concerning efficiency and efficacy of care, the question arises how the departments of pediatrics can be integrated into a large general hospital without neglecting a child friendly atmosphere. We strongly suggest that all patients with a chronological or a developmental age under 18 years should be treated in the child care departments. Neonates, infants, young school children, and adolescents as well as disabled young adults should ideally have their own wards. However, this arrangement may not be easily established in smaller children's hospitals with too few patients in each age group. This assumption raises the important but difficult question on the ideal size and number of beds per ward that may vary from 18 to 28 beds according to the non-age-dependent subspecialty of the wards. Locating the neonatal wards (including the neonatal intensive care unit) next to the department of obstetrics should not be a major problem. Furthermore, the pediatric wards should not be situated too far away from all the different core facilities such as operating theaters and imaging units. Finally, many newly built

hospitals have tall buildings to optimize on space. However, it is highly questionable whether a fifth floor would be an adequate location for children. Children should have easy access to an indoor and an outdoor playground, which are overseen to guarantee the safety of children.

## The Role of the European Union

In recent years, the European Commission, the executive body of the European Union (EU), has focused on specific health conditions, supporting the research on severe and rare communicable and noncommunicable chronic diseases. This activity is aimed at improving and implementing the quality and standards of care for the European citizens. However, in our opinion there has been a lack of support for establishing criteria that should govern the planning, building, and managing of future children's hospitals. In 2015, the European Observatory started an initiative to publish the shared visions and clear directions of chosen experts on future hospitals in Europe. The authors of this article are also co-authors of the chapter in a book on the future of European children's hospitals of the European Observatory. Here we want to start the debate by illustrating the complexity of the process of establishing criteria that could be used throughout Europe. In fact, international recommendations should respect common quality standards in the delivery of care, their proper administration, and they should be able to meet the national challenges of progressively evolving socioeconomic conditions and health dimensions. Establishing and governing efficient communication channels among the multiple key players involved in the healthcare provided in children's hospitals, may allow the EU to play a relevant role in coordinating combined efforts according to the different needs of the 53 European countries. In the absence of the unifying role of the EU, single projects

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developing in different European areas are at risk of producing inefficient children's hospitals, which lack the necessary international networks of mutual co-operation, despite their intrinsic excellence. This may result in a missed opportunity to develop efficient cross-border European healthcare planning.

## The Role of European Countries

It is widely assumed in the media that healthcare systems are relatively resistant to change. The complicated coordination of all political decision makers may slow down the implementation of changes in children's hospitals and may lead to secondary controversies reducing the motivation of the medical personnel. Depending on the political system of European nations, the planning of children's hospitals may involve several ministries (eg, Health, Labor and Social Affairs, Family Affairs, Transportation, Building, and Urban Affairs). In some countries, such as Russia, the state is the main planning and executive branch, whereas in others, such as Germany, the activities of the state may be limited to an umbrella and observer function.

## The Role of Health Insurance Funds

Since 1990, more East European countries have introduced the health system with health insurance funds. These are not only responsible for paying for the care of hospitalized children, but they are also part of the opinion and decision making for future hospitals. We are unaware of any data demonstrating how they interact in different European countries when planning renovation of old children's hospitals or in new hospital design.

## The Role of European Child Health Care Organizations

European pediatricians working in 53 countries are not represented by a coordinating umbrella association resembling the American Academy of Pediatrics in the US. For example, there is no single European society of pediatrics that issues widely accepted guidelines for planning children's hospitals in Europe. Instead there are competing European pediatric associations, which have almost no voice in society and in Europe, neglecting the motto of "United we stand, divided we fall." Putting the child at the center of all activities and respecting national traditions and idiosyncrasies will play a crucial role when implementing new strategies for hospitals in different countries in East, West, North, and South Europe.

Even within a given European country, there may be 2 or more competing national pediatric associations (eg, one for academic and/or hospital pediatricians, another one for general and primary care pediatricians, and a third one for social

pediatrics such as Germany). Differing aims in these associations may inhibit consensus among pediatricians diminishing their impact when negotiating with politicians and policy makers. Another important stakeholder is the nurses' associations. However, the communication among the different organizations of pediatricians, general practitioners, and nurses is currently scarce at national and international level. This fact further contributes to the inefficiency of a proper interaction of all decision makers. We conclude that the lack of unifying international concepts is one of the main obstacles in planning and adapting child healthcare in hospitals to the new needs.

## The Role of Hospitals

Hospitals are an important part of the national and local economy, for example large hospitals rank among the top employers in many cities. Pediatric hospital care also has become a business in many countries with health insurance systems. However, hospital care for children is more than a business. From a management business point of view, pediatric care is usually less profitable for the hospital than adult specialties, such as cardiology or cardiac surgery. However, from a national economic position, cost-effectiveness calculations spread over the whole life span of an individual person may produce completely different results.<sup>2</sup> Additional costs related to child care (compared with adult care) include hospital school, kindergarten, speech therapists, psychologists, social workers, career advisers, playgrounds, admission of parents, and meals for parents. This extra cost is often not adequately covered in a diagnosis-related group system, health insurance, or national health systems.

## Conclusions

Participation of hospital pediatricians in planning, financing, and decision making should be encouraged to reduce unnecessary cost and to increase the quality of hospital care. Therefore, training in public health, health economics, and systems for pediatricians and nurses would allow better understanding of the strengths and limitations of health economics and health economic analyses to participate in resource allocation decisions. ■

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# Conceptual Design of Future Children's Hospitals in Europe: The Role of Caregivers in Transferring New Concepts from Theory into Practice

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In this third article in a series debating the conceptual designing of future of children's hospitals in Europe, we discuss the role of caregivers as transferors of new concepts from theory into practice.<sup>1,2</sup>

## The Role of Pediatric Directors and Heads of Department

Establishing a good balance among quality of medical care, teaching and training, research, economic stability, and child friendly care may be achieved in different organizational ways in small and large hospitals. The alternative models range from hierarchical systems resembling a military system to democratic systems based on sharing responsibilities by elected senior staff members. Filling the gap between power and intellect when managing children's hospitals means strengthening those persons who have taken the leadership role and who are responsible for implementing good governance (Table I; available at [www.jpeds.com](http://www.jpeds.com)). Highly qualified medical scientists might not necessarily be good hospital managers; management skills combined with clinical experience is a good model. Spreading power among different pediatric subspecialists in more or less independent subspecialty units in university children's hospitals may result in unproductive competition between different units, leading to fragmented care. The number of beds per subspecialty unit is probably not the critical aspect when discussing the implementation of fair play rules with units; however, because each of these subspecialties, such as cardiology, neonatology, and nephrology, must have a full team of coworkers to be able to offer 24-hour services, there will be competition for the annual budgets. In some countries, like Germany and Italy, that use the diagnosis-related group system, some subspecialties will benefit from the payment system—thus showing a profit at the end of the year— whereas others may end up in a deficit.

The crucial question in a departmental system is how to convince all heads of subspecialties that they must also feel responsible for the entire children's hospital. Neither the ideal size of such subspecialty teams nor their total numbers in highly specialized pediatric centers of competence are well defined, given the scarcity of research data on the pros and cons of the different ways of organizing all 38 pediatric subspecialties reported in Europe.<sup>3</sup> Thus, future research activities in this field will need to provide guidelines for managing large modern children's hospitals. Leaders of future children's hospitals should train to transform services through a permanent learning culture of all staff members by defining the values of innovation, learning, and improvement as a central theme.

## The Role of Hospital Managers

Positive and balanced interaction between the medical directors and management (ie, finance, administration) plays a key role in planning the children's hospital of the future (Table I). In fact, the pressure to “deliver more for less” often seems to be the driving force in political strategic decisions in the area of pediatric healthcare, usually in response to global economic pressures and often in obedience to generalized budget restrictions imposed by local financial policies.

## The Role of National Hospital Organizations and Federations

National hospital organizations or federations represent hospital owners (the state, the church, or private companies, or all 3 in some countries) in health policy affairs at the national level and the European Union level, advocate for hospital interests, and promote awareness of issues concerning the hospital sector. In cooperation with government authorities and other institutions in the healthcare sector, hospital federations aim to sustain and improve hospital performance as part of their statutory obligations. Usually they pursue only public, noncommercial objectives by promoting exchange of knowledge and supporting scientific research in healthcare.

Hospitals are an important economic factor in every country's growing healthcare market. In some regions, hospitals are one of the most important employers. Health policy reforms of the recent past—prompted in part by the financial crisis of 2008—have led to a growing scarcity of financial resources for hospitals in many countries. This trend is affecting children's hospitals as well, and will continue to affect child health care services in the future. One of the key objectives of children's hospitals is to ensure accessible and child-oriented care in the face of growing competition among hospitals.

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## The Role of Pediatricians

In many European countries, one-half of the pediatricians work in hospitals and the other one-half work in private practices or state-owned polyclinics or other settings. A key factor in ensuring the provision of integrated, efficient, and adequate care to children both in children's hospitals as well in the office-based healthcare settings undergoing reform will be the ability of primary care pediatricians, general practitioners, and hospital pediatricians to coordinate the care of children at the interface of private practices or polyclinics on one side and children's hospitals on the other side. Currently, each group of physicians represents and lobbies its own members. Primary care pediatricians play a limited role in designing future children's hospitals, but an integrated health system involving primary, secondary, and tertiary care is essential with a hub-and-spoke system. On the other hand, hospital pediatricians may be biased, because they tend to focus on in-patient care without filling the gap between primary and secondary/tertiary care services. If both sides continue to take a typical union type of approach, this behavior may mislead European legislators to believe that professionals, not children, are central to pediatric care. Our approach is to seek a strategic integration of all pediatric care and by putting the child and family into the center of all activities.

## The Role of Physicians Other Than Pediatricians

Not all hospitalized children are treated by pediatricians or pediatric subspecialists. Many children are treated by adult specialists (eg, neurosurgeons, ophthalmologists). The trend toward transferring children into children's hospitals differs from country to country and from hospital to hospital, not all of which offer the complete spectrum of medical care. In some countries, like Germany, the rapid progress of further subspecialization and fragmentation of care has given rise to the concept that adult organ specialists might be the best experts and thus could care for patients of all ages, including children. Although this idea has not gained widespread acceptance, the ongoing discussion may have negative effects on the planning of children's hospitals of the future. Likewise, the idea that neonatology can become part of obstetrics and gynecology grew out of the close collaboration between obstetricians and neonatologists. Given that the long-term care of sick neonates must be provided by competent pediatric teams, we conclude that this care should continue to be provided mainly by pediatricians.

## The Role of Nurses

Nurses are a pillar of strength during the hospital care of children. Similar to pediatricians, they are experiencing increasing demands of administrative work, which is reducing their precious time to spend with young patients. Based on our experience, we conclude that in Ireland and the United Kingdom, where nurses often move into senior management positions, nurses are very closely involved in planning; however, in other

European countries, the role of nurses in children's hospitals has become increasingly difficult, and nurse specialists have become rare. There is currently a shortage of nurses in Eastern European countries, owing in part to the migration of nurses to wealthier countries. Furthermore, some countries (eg, Germany) have abandoned the 3-year training program for specialized pediatric nurses. Other countries have failed to broaden the training of nurses from the grade of helper nurse to the grade of nurse practitioner or academic nurse. Thus, more cohesion is needed between health care workers and the huge variations in nursing involvement across Europe.

## Prototypes for Implementing New Highly Specialized Pediatric Centers of Competence in a Country

The Working Group of the European Paediatric Association/Union of National Paediatric Societies and Associations Scientific Advisory Board has developed prototypes aimed at implementing new highly specialized pediatric centers of competence in the European countries. **Table II** (available at [www.jpeds.com](http://www.jpeds.com)) describes 3 potential models aimed at reducing the number of subspecialty units in highly specialized pediatric centers of competence, emphasizing the potential impact of public funding into the planning of new types of children's hospitals.<sup>4</sup>

## Conclusions

The ultimate aim of our 3-article series is to spark a debate among the key players engaged in providing efficient and effective updated care in children's hospitals and to stimulate positive interactions among all decision makers concerning hospital care. The future of children's hospitals and their ability to effectively respond to the challenges generated by a world in continuous social and economic evolution depends to a great extent on the ability to establish effective and positive communication among all the experts involved in such an important enterprise for children and their health. ■

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**Table I. Cooperative aims shared by medical and administrative management**

1. Stimulating cooperation of staff members (eg, avoid negative competition when expanding or reducing the services)
2. Integrating child units into general hospitals (eg, children must be admitted to children's wards)
3. Installing effective control (eg, heads of departments must be informed regularly about the success and failure of services)
4. Anticipating financial and organizational crises, including inadequate funding, shortage of subspecialists, etc
5. Implementing cross-funding between subspecialty units to support whole systems thinking
6. Adapting to the European Union regulations for working hours of hospital personnel and developing new working structures (eg, on night shifts and weekend services)
7. Stimulating positive and balanced interaction between the medical directors and management (finances, administration)

**Table II. Prototypes for implementing highly specialized pediatric centers of competence in European countries (European Paediatric Association/Union of National Paediatric Societies and Associations Scientific Advisory Board Working Group)**

Proposed models aimed at reducing the number of subspecialty units in existing tertiary care hospitals and at creating a limited number of highly specialized pediatric centers of competence with a broader spectrum of pediatric subspecialties:

1. Top-down model

National or regional governments or other funding institutions are planning the number, location, structure, and management of new highly specialized pediatric centers of competence. This will be followed by inviting professional hospital architects and public health managers to develop a road map for building these pediatric centers of competence. If a monolithic (hierarchical) leadership system is chosen for the center, its new pediatric director will act as a liaison officer between the owners of the center, the administration, the medical team, and the patients and their families.

2. Bottom-up model

Several leaders of tertiary care children's hospitals will have to create a committee that will design a plan for how the adequate provision of subspecialty care in their region or country can be best implemented. Such a consensual decision making process may be complicated and may take many years.

3. Combination of both models

National or regional governments are planning the number, structure, and financing of new highly specialized pediatric centers of competence. Their proposal will be presented to a committee of leaders of tertiary care children's hospitals who will have to report the results of their discussions on the location and management of the new centers back to the government. The subsequent period of planning the implementation of new centers should have a deadline; however, it may take up to 5 years to find a structure that will be accepted by all key players.

