



The Child Health Care System in Italy

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Pediatric care in Italy has been based during the last 40 years on the increased awareness of the importance of meeting the psychosocial and developmental needs of children and of the role of families in promoting the health and well-being of their children. The pediatric health care system in Italy is part of the national health system. It is made up of 3 main levels of intervention: first access/primary care, secondary care/hospital care, and tertiary care based on specialty hospital care. This overview will also include a brief report on neonatal care, pediatric preventive health care, health service accreditation programs, and postgraduate training in pediatrics. The quality of the Italian child health care system is now considered to be in serious danger because of the restriction of investments in public health caused both by the 2008 global and national economic crisis and by a reduction of the pediatric workforce as a result of progressively insufficient replacement of specialists in pediatrics. (*J Pediatr* 2016;177S:S116-26).

The National Ministry of Health is the major health care provider in Italy, and the health care system is mainly financed through general taxation. It is regionally and locally managed, and it provides universal coverage for comprehensive and essential health services. Italy's National Health Service (Servizio Sanitario Nazionale [SSN]) was established in 1978 and replaced the previous system of state insurance established in the post Second World War years.

The purpose of SSN is to provide an efficient and comprehensive health system covering the entire population, irrespective of income or contributions, employment, or preexisting health conditions. The SSN provides free or low-cost health care to all residents and their families, plus university students and retirees (including those from other European Union [EU] countries) and emergency care to visitors, irrespective of their nationality.

Since 1998, the SSN has been funded directly by the central government through a regional tax, the Imposta Regionale Sulle Attività Produttive tax, which is paid by employers on behalf of employees; the self-employed pay for themselves through their taxes.¹ A foreign individual does not pay direct contributions to benefit from the SSN coverage and need only to be a resident of Italy or a citizen of an EU country to receive the same health benefits as an Italian.

Since 1999, Italian regions are fully responsible for governing, regulating, financing, and monitoring their regional health care systems. Regions are responsible for: (1) strategic planning process and local regulation in the health and health care area at regional and local level; (2) coordinating health care providers and providing health care services; (3) deciding on the priorities for financing health care organizations that provide services financed through the Regional Health Fund (accredited public and private organizations, local health authorities, teaching hospitals, and accredited private providers); and (4) creating guidelines for providing services in the regional health departments, including assessing the need to build new hospitals, accreditation programs, and accounting systems.

Individuals who qualify for health care under the SSN are entitled to an SSN card, and their dependents receive the same benefits and are included on the same card. Dependents include the spouse (unless he/she is personally insured), children who are under the age of 16 years (or under the age of 26 years if they are students or unable to work through illness or invalidity), and past and present generations and relatives by marriage if supported and living in the same household of the individual carrying the SSN insurance.

If not entitled to public health benefits through payment of Italian taxes or by receiving a state pension from another EU country, individuals must usually have private health insurance and must present proof of this when applying for a residence permit.

| | |
|------|---|
| ED | Emergency department |
| EU | European Union |
| FTA | Functional territorial aggregation |
| GP | General practitioner |
| NCU | Neonatal care unit |
| NICU | Neonatal intensive care unit |
| PACS | Pediatric ambulatory consulting service |
| PCP | Primary care pediatrician |
| PHU | Pediatric hospital unit |
| SSN | Servizio Sanitario Nazionale (Italy's National Health Care Service) |

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The SSN is largely under the control of regional governments and is administered by local health authorities (Azienda di Sanità Locale, often referred to by their former name *Unità Sanitaria Locale*). Registration with the SSN entitles individuals to choose a general practitioner (GP) (adults and children >6 years old) and a family pediatrician (children <6 years old). Children between 6 and 16 years of age may register with a family pediatrician of the SSN or have the option to register with a SSN's GP. The SSN provides for hospital admissions and treatment (including tests, surgery, and medication during hospitalization), visits to family doctors and family pediatricians, specialist care provided by pediatricians, obstetricians, and other specialists, discounted medicines, laboratory services, appliances, ambulance services, and free services at a local health unit (*consultorio*).¹

Those who are registered with the SSN are entitled to free or subsidized medicine, a 75% reduction on the cost of outpatient and after-care treatment, and some subsidized dental treatment. All inpatient treatment such as hospitalization is free under the national health service. Many medical expenses can be totally or partially (19%) deducted for tax purposes, including the cost of spectacles, hearing aids, and visits to medical specialists.

Preventive medicine, promotion of good health, and reforming an overstructured bureaucracy are areas where governments have focused their interest over the last 10 years, in order to further modernize and update the National Health System. After the 2008 global economic crisis, the aim of the Italian public health system has been to rationalize the services from a cost-containment perspective. In 2014, the Ministry of Health issued a 3-year financial plan that includes a program of cost containment and investments respectful of the EU financial rules. According to such a plan, the total annual investments in the public health system are €109.9bn in 2014, €112.0bn in 2015, and €115.4bn in 2016.²

The pediatric health care system in Italy is part of the National Health System, and it is described in the classical 3 main levels of intervention: first access/primary care, secondary care/hospital care, and tertiary care based on specialty hospital care.³ This overview will also include a brief report on neonatal care, pediatric preventive health care, health service accreditation programs, and postgraduate training in pediatrics.

Pediatric Primary Care and First Access Care

First access care and most primary care pediatrics in Italy developed during the last 40 years largely based on the concepts of family-centered and family-oriented care.⁴ This resulted from an increased awareness of the importance of the psychosocial and developmental needs of children and the role of families in promoting the health and well-being of their children. The latter, with the inclusive aim of extending the responsibilities of the pediatrician to include health promotion, screening, assessment, as well as referral of parents for physical, emotional, social problems, or health risk behaviors that can adversely affect the health and emotional or social well-being of their child.⁴

Studies of European countries reveal profound differences in the organization of children's (nonhospital) first-contact services. Three main models exist, which are based on whether primary care general physicians, primary care pediatricians (PCPs), or combinations of both are primarily responsible for care.⁵ In Italy, pediatric primary care up to 6 years of age is provided exclusively by PCPs.

Primary Care

Primary care includes general first-access care for children and adolescents (0-16 years), which is provided by PCPs paid through a state collective agreement. It is organized in a national "family pediatrics" network. Such a system was established in 1981. Since then, the Italian National Health Service has provided pediatric primary care to children through the PCPs, who are commonly called family pediatricians (*pediatri di famiglia*). The Italian Public Health Care System requires that all children have an identified primary care provider, depending on the patient's age. Italian pediatricians related to the Public Health Care System work in their own private offices, providing primary care of patients from birth to 16 years of age and are compensated under a capitation system, based on the number of children registered with each PCP. Pediatricians working for the Public Health Care system are usually the sole patient entrance to public secondary and tertiary care in range of 0-6 years of age, and parents can choose between a pediatrician and a GP for their children who are between 6 and 16 years of age.⁶

The whole Italian territory is divided into 708 health districts. Most of them are covered by PCPs. However, in some districts without PCPs, pediatric primary health care is provided by GPs or other medical specialists. Following a recent agreement between the Ministry of Health and the PCPs network,⁷ 2 new functional structures, called functional territorial aggregation (FTA) and complex primary care unit, will be implemented in order to further integrate the various duties and activities of PCPs and promote a more efficient interaction between PCPs and pediatric hospital and specialty centers.

The FTA identifies a group of about 30 PCPs, coordinated by 1 PCP who is identified among the participants in each FTA. This new structure significantly changes the previous situation, where a PCP worked alone in his or her clinic, isolated from other professionals and care provision.⁸ In the FTA, each PCP remains in his or her own office but will be part of a group only functionally connected. They can share a budget with the same objectives, meetings and, if needed, they can also share clinical data and support staff. Complex primary care units are made up of groups of PCPs that operate in the same building and are assisted by nurses and administrative staff performing an integrated clinical activity with social workers and other medical specialists.

In accordance to the SSN, the ratio of children/pediatrician is officially 800, although sometimes this number may be higher in order to meet the population's needs. **Table I** shows the total number of PCPs active in Italy (7656),

Table I. Number of PCPs in Italy (2014)

| Regions | PCPs/groups of children cared for | | | | | | | | Children/PCP mean number |
|-----------------------|-----------------------------------|-----|------------------|------|---------------|------|--------|-----|--------------------------|
| | 1-250 children | | 251-800 children | | >800 children | | Total | | |
| | Number | % | Number | % | Number | % | Number | % | |
| Piemonte | 4 | 0.9 | 81 | 18.3 | 358 | 80.8 | 443 | 100 | 972 |
| Valle d'Aosta | | | 5 | 27.8 | 13 | 72.2 | 18 | 100 | 813 |
| Lombardia | 8 | 0.7 | 272 | 23.0 | 905 | 76.4 | 1185 | 100 | 947 |
| Province of Bolzano | 1 | 1.7 | 10 | 16.9 | 48 | 81.4 | 59 | 100 | 1009 |
| Province of Trento | 1 | 1.3 | 14 | 18.4 | 61 | 80.3 | 76 | 100 | 884 |
| Veneto | 4 | 0.7 | 70 | 12.2 | 500 | 87.1 | 574 | 100 | 1006 |
| Friuli-Venezia-Giulia | | | 17 | 13.9 | 105 | 86.1 | 122 | 100 | 974 |
| Liguria | 5 | 2.9 | 46 | 26.7 | 121 | 70.3 | 172 | 100 | 879 |
| Emilia-Romagna | 7 | 1.1 | 198 | 32.2 | 410 | 66.7 | 615 | 100 | 832 |
| Toscana | 12 | 2.7 | 87 | 19.4 | 350 | 78.0 | 449 | 100 | 894 |
| Umbria | | | 42 | 36.8 | 72 | 63.2 | 114 | 100 | 824 |
| Marche | 2 | 1.1 | 30 | 16.5 | 150 | 82.4 | 182 | 100 | 916 |
| Lazio | 2 | 0.3 | 165 | 21.2 | 611 | 78.5 | 778 | 100 | 829 |
| Abruzzo | 2 | 1.1 | 59 | 33.0 | 118 | 65.9 | 179 | 100 | 820 |
| Molise | | | 9 | 24.3 | 28 | 75.7 | 37 | 100 | 843 |
| Campania | 5 | 0.7 | 225 | 30.7 | 504 | 68.7 | 734 | 100 | 864 |
| Puglia | 8 | 1.4 | 187 | 32.1 | 388 | 66.6 | 583 | 100 | 818 |
| Basilicata | | | 22 | 35.5 | 40 | 64.5 | 62 | 100 | 844 |
| Calabria | 5 | 1.8 | 105 | 38.6 | 162 | 59.6 | 272 | 100 | 808 |
| Sicilia | 12 | 1.5 | 246 | 31.0 | 536 | 67.5 | 794 | 100 | 814 |
| Sardegna | 2 | 1.0 | 89 | 42.8 | 117 | 56.3 | 208 | 100 | 764 |
| Italy | 80 | 1.0 | 1979 | 25.8 | 5597 | 73.1 | 7656 | 100 | 879 |

sorted by region, and the ratio of children/PCP. In absence of sufficient replacement numbers of specialists in pediatrics, the number of PCPs is projected to decline during the next 10 years. As shown in **Table II**, in 2015 the National Institute of Statistic reported that more than 50% (4049) of the 7656 PCPs active in 2012 had practiced for more than 23 years and were more than 50 years old.⁹

First Access Care

First-access care for children <7 years old is mandatorily provided by PCPs. Care for children >6 years of age is provided either by pediatricians (70%) or by other health care providers (GPs, internal medicine specialists of the state network) with no direct cost to the patient but a copayment is involved if a subspecialist consultation is provided.

Table II. Years in active service of PCPs in Italy (2012)

| Regions | PCPs/y of work after specialty in pediatrics | | | | | Total | % males | % females |
|-----------------------|--|-------|--------|---------|-------|-------|---------|-----------|
| | 0-2 Y | 2-9 Y | 9-16 Y | 16-23 Y | >23 Y | | | |
| Piemonte | 3 | 34 | 44 | 112 | 250 | 443 | 31.2 | 68.8 |
| Valle d'Aosta | | 5 | 2 | 4 | 7 | 18 | 33.3 | 66.7 |
| Lombardia | | 75 | 153 | 444 | 513 | 1185 | 25.1 | 74.9 |
| Province of Bolzano | | 8 | 17 | 20 | 14 | 59 | 37.3 | 62.7 |
| Province of Trento | | | 5 | 18 | 53 | 76 | 31.6 | 68.4 |
| Veneto | 2 | 18 | 53 | 194 | 307 | 574 | 39.7 | 60.3 |
| Friuli Venezia Giulia | | 10 | 11 | 45 | 56 | 122 | 36.1 | 63.9 |
| Liguria | | 8 | 15 | 27 | 122 | 172 | 52.9 | 47.1 |
| Emilia Romagna | 4 | 60 | 72 | 183 | 296 | 615 | 32.8 | 67.2 |
| Toscana | | 11 | 27 | 125 | 286 | 449 | 42.5 | 57.5 |
| Umbria | 1 | 7 | 12 | 23 | 71 | 114 | 32.5 | 67.5 |
| Marche | 1 | 5 | 14 | 77 | 85 | 182 | 40.7 | 59.3 |
| Lazio | | 2 | 27 | 164 | 585 | 778 | 33.7 | 66.3 |
| Abruzzo | | | 2 | 53 | 124 | 179 | 41.9 | 58.1 |
| Molise | | | | 26 | 11 | 37 | 54.1 | 45.9 |
| Campania | 5 | 20 | 79 | 320 | 310 | 734 | 47.4 | 52.6 |
| Puglia | | 4 | 47 | 276 | 256 | 583 | 45.6 | 54.4 |
| Basilicata | | | 5 | 35 | 22 | 62 | 35.5 | 64.5 |
| Calabria | 40 | 37 | 15 | 67 | 113 | 272 | 30.9 | 69.1 |
| Sicilia | | | 18 | 322 | 454 | 794 | 41.3 | 58.7 |
| Sardegna | | 1 | 12 | 81 | 114 | 208 | 36.5 | 63.5 |
| Italy | 56 | 305 | 630 | 2616 | 4049 | 7656 | 37.0 | 67.0 |

Table III. Pediatric EDs in Italy

| Regions | No of ED centers |
|-------------------------|------------------|
| North of Italy | |
| Piemonte | 11 |
| Valle d'Aosta | 1 |
| Lombardia | 23 |
| Province of Bolzano | 1 |
| Province of Trento | 1 |
| Veneto | 4 |
| Friuli-Venezia-Giulia | 3 |
| Liguria | 5 |
| Emilia-Romagna | 3 |
| Center of Italy | |
| Toscana | 4 |
| Umbria | |
| Marche | 2 |
| Lazio | 6 |
| Abruzzo | 1 |
| Molise | |
| South Italy and islands | |
| Campania | 17 |
| Puglia | 2 |
| Basilicata | |
| Calabria | 2 |
| Sicilia | 6 |
| Sardegna | 5 |
| Italy | 97 |

First-care access is provided by Family Pediatrics from Monday through Friday from 8:00 a.m.-8:00 p.m. and from 8:00 a.m.-2:00 p.m. on Saturday in their offices. These services are provided to all patients free of charge. Pediatricians, as well as GPs in the Italian SSN, are not allowed by law to take care of their patients during hospital admissions.

First Access Care for Acute Diseases. The SSN provides cost-free night and weekend phone coverage as well as urgent home care to all patients, using GPs who generally have scarce pediatric training. Children and adolescents with acute symptoms or with any kind of health emergency that develops outside office hours are taken by parents to local emergency outpatient units (5%) or to hospital emergency departments (95%). In larger cities, emergency care may be divided into a pediatric and general service. In smaller towns, it may be provided as a combined general and pediatric emergency care service. In the latter case, after a first care contact, children are generally forwarded to the reception ward within the hospital's pediatric unit. **Table III** shows the number of pediatric emergency departments (EDs) in Italy, and their distribution among the 21 regions.

The Pediatric Ambulatory Consulting Service. During recent years, local emergency care programs have been implemented in many of the 708 national health districts. Such programs include the pediatric ambulatory consulting service (PACS), which has proven to be successful as an efficient and cost-containment program. PACS program, operated by PCPs, is active in hospitals and triage of the clinical conditions of outpatients <18 years old before they access the EDs. PACS is active during the weekends (Saturday-Sunday),

which in the Italian health care system coverage is not provided by the public health services because it is usually provided by the family pediatricians during the weekdays.

In Italy, like in other European nations with similar public health systems, a massive increased attendance of patients is experienced by the hospital EDs, when the family doctors do not work in accordance to their standard work contract agreements. Pediatric ED are usually active in Italy only in few of the largest hospitals; in the remaining hospitals, pediatricians are generally not included in the ED teams. This less than ideal situation results from the need to contain health care costs.

When children are seen in the majority of hospitals with no pediatric ERs and in absence of pediatricians in the ED teams, typically they are referred directly to the hospital pediatric unit, even if they are classified as "white codes" or class 4, in accordance to the typical international pediatric triage scale categorization.^{10,11}

This practice, often results in unnecessary hospitalization of children for 1 or more days. This is a frequent situation, which represents a heavy financial burden for the hospital administration.¹²

PACS program provides an initial clinical assessment and care for patients <18 years old whose parents or guardians claim the existence of a pathologic condition when they arrive at the hospital EDs. The patients classified as "white codes" and "green codes"^{10,11} are provided care in the PACS room service. Only the patients classified as "yellow" and "red codes" are referred to ERs for further assessment, which may include hospitalization depending on their clinical condition.

Where implemented, the PACS program reduced the total pediatric and nonpediatric admissions to the EDs by over 12% in 1 year. In particular, the mean reduction of cases registered as white and green codes in the EDs decreased by over 50% per year, and data show a reduction of hospitalization of over 15% per year for subjects <18 years of age.¹³

First Access Care for Long-Term Conditions and Chronic Disorders. There is no specific system to provide first access care for children and adolescents with chronic diseases showing a worsening of clinical conditions. Home care by the PCPs as well as other health professionals can be arranged for selected cases by the health authorities.

Patients with long-term conditions are referred to the family pediatrician or directly to specialist centers where they are regularly treated for their underlying chronic disease.

Home or Domiciliary Care. Home or domiciliary care is regionally based and provision depends on different regional regulations and laws. Generally, the provision of domiciliary care for chronic patients or early discharge from hospital for complex conditions are established through a regional agreement for pediatric primary care (dated October 28, 2001), in accordance to the preliminary declaration and chapter III of the National Collective Agreement.¹⁴ The regional agreement for pediatric primary care

established the following 3 types of pediatric care for patients with long-term conditions: (1) integrated domiciliary care (patients are seen at home by various specialists and receive care by different professional figures, all coordinated by the pediatrician in charge of the patient); (2) programmed domiciliary care (pediatricians care for patients at their home following a standard schedule that depends upon the disease); and (3) programmed ambulatory care (patients with chronic conditions are seen home but they are programmed for visits in hospitals because of the complexity of their medical conditions).

Secondary Care in Children's Hospitals

Italy has a long tradition of providing hospital care. For example, the Innocenti Hospital (ospedale degli innocenti), in Florence, was the first pediatric hospital established in Europe thanks to the funding received for charitable purposes from a few Florentine business families (Albizzi and other wealthy families). It was designed by the architect Filippo Brunelleschi and was inaugurated on January 25, 1445. Today, it still provides pediatric care; it is now the headquarters of the United Nations Children's Fund Innocenti Research Center. After the unification of Italy as a state in 1861, pediatric hospitals and pediatric hospital units (PHUs) were established during the second half of the 19th century, generally funded by private funding (banks, private benefactors). Only from the beginning of the 20th century did they become progressively integrated in the national health system.

In Italy, PHUs admit children 0-18 years of age. The National Health Plan issued by the Ministry of Health in 2000 planned for a ratio of 1 PHU/200 000 people (including adults and children) to be reached progressively during the following years.¹⁵ In 2011, the ratio was reported by the Italian National Institute of Statistics to be 1 PHU/119 000 people.¹⁶ The 501 pediatric hospital centers in Italy are not homogeneously distributed throughout the national territory (Table IV). The total pediatric beds in hospitals decreased significantly during the last 15 years. During the 5-year period 2007-2012, the reduction was 19.9%. By 2007, there were 7532 pediatric beds with 1311 available for day-hospital care; in 2012, the total pediatric beds were 6038, of which 870 were day-hospital beds. This trend is due to the combination of several factors, including cost-containment policies, reduction of birth rates, and more efficient organization and rationalization of the pediatric health care in general. This has put an emphasis on strengthening the role of family pediatrics in EDs, outpatients clinics, and nonhospital health care services.

In order to comply with the cost-containment policies issued in the years following the 2008 global economic turmoil, the most recent National Health Plan² has identified a further rationalization of the National Health System, which also impacts pediatric hospital care. Such measures of cost-containment include a further general reduction of investments in child health care by reducing the number of PHUs and by increasing collaboration between family

pediatricians and PHUs to induce integration and to avoid fragmentation.

Tertiary Care and Highly Specialized Children's Hospitals

Pediatric specialty care is provided in specialized PHUs within public civil or academic general hospitals and in children's hospitals. In such settings, specialists in pediatrics with an interest (often exclusively) in a particular organ or intervention usually provide care for specific chronic or acute diseases. These pediatricians, with specific expertise in a given specialty coordinate the care for children with complex or rare chronic conditions, working in teams with general pediatricians, psychologists, dieticians, and therapists and other professionals as required by the child. Teams of hospital pediatricians and nurses provide most out-of-hours care for children with chronic illnesses. Subspecialty care is rarely offered to children by adult or general internists.

In Italy, there are 12 children hospitals of which 3 are classified by the Ministry of Health as institutes for pediatric care and clinical and basic research (Istituti di Ricovero e Cura a Carattere Scientifico). They are based in Genova (Istituto Giannina Gaslini), Trieste (Ospedale Burlo Garofolo), and Rome (Ospedale Bambino Gesù). Table V shows the distribution of the 12 specialized children's hospitals of the Italian territories and their competences reported by the Ministry of Health in 2005.¹⁷

Neonatal Care

As reported by the Italian Ministry of Health in its document on national birth data¹⁸ released in 2015, there are 567 birth units, called birth locations (Punti Nascita), including 210 neonatal care units (NCUs) (202 are located in public and

Table IV. PHUs in Italy

| Regions | No of PHUs |
|-----------------------|------------|
| Piemonte | 34 |
| Valle d'Aosta | 1 |
| Lombardia | 67 |
| Province of Bolzano | 7 |
| Province of Trento | 4 |
| Veneto | 35 |
| Friuli Venezia Giulia | 8 |
| Liguria | 9 |
| Emilia Romagna | 27 |
| Toscana | 29 |
| Umbria | 14 |
| Marche | 15 |
| Lazio | 33 |
| Abruzzo | 17 |
| Molise | 5 |
| Campania | 45 |
| Puglia | 45 |
| Basilicata | 7 |
| Calabria | 21 |
| Sicilia | 62 |
| Sardegna | 16 |
| Italy | 501 |

Table V. Specialized children's hospitals on the Italian territory and their competences

| Type of specialty units | Children hospitals in Italy (competences reported by the Italian Ministry of Health in 2005) | | | | | | | | | | | |
|-------------------------|--|----------------------------|-----------------------|--------------------|-------------------------|----------------------------|----------------|---------------|--------------------|-------------------|---------------------------|-------------------------|
| | Northern | | | | | | Center | | | | Southern | |
| | St Anna, Torino | Cesare Arrigo, Alessandria | Vittore Buzzi, Milano | Umberto I, Brescia | Burlo Garofalo, Trieste | Istituto G.Gaslini, Genova | Meyer, Firenze | Salesi Ancona | Bambino Gesù, Roma | Santobono, Napoli | D.V. Giovanni XXIII, Bari | G. Di Cristina, Palermo |
| Heart surgery | • | | • | | | • | • | • | | • | • | |
| Cardiology | • | | • | | | | | • | | • | • | |
| Surgery | • | • | • | • | • | • | | • | • | • | • | |
| Plastic surgery | | | | | | | | • | | | • | |
| Vascular surgery | | | • | | | | | | | | | |
| Dermatology | | | | | | • | | | | | • | |
| Hemodialysis | | | | | | | | • | | | | |
| Hematology | • | | | | | | | • | | | • | |
| Gastroenterology | • | | | | | | | • | | | | |
| Major burns | • | | | | | | | | | | • | |
| Endocrinology | • | | | | | | | • | • | • | | |
| Infectious diseases | • | | | • | | • | • | • | | • | • | |
| General medicine | | | | | | | | • | | | | |
| Sports medicine | | | | | | | | • | | | | |
| Nephrology | • | | | | • | • | | • | • | • | • | |
| Nephro-transplant | | | | | | | | • | | | | |
| Neonatology | • | • | • | • | • | • | • | • | • | • | • | |
| Neurosurgery | • | | | | | • | | • | • | • | • | |
| Neurology/psychiatry | • | • | • | • | • | • | | • | | • | • | |
| Neuro-rehabilitation | | | | | | | | | | | | |
| Ophthalmology | | | | | • | • | | | • | | | |
| Odontostomatology | | | • | | • | | | | • | | | |
| Onco-hematology | • | | | | | • | • | • | • | | | |
| Orthopedics | • | • | • | • | • | • | | • | • | • | • | |
| Ear, nose, and throat | | | • | • | • | • | | • | • | • | • | |
| General pediatrics | • | • | • | • | • | • | • | • | • | • | • | |
| Pneumology | • | | | | | • | | | | • | | |
| Rheumatology | | | | | | • | | • | | | | |
| Rehabilitation | | | | | | | | • | | | | |
| Intensive care | • | • | • | • | • | • | • | • | • | | • | |
| Neonatal intensive care | • | • | • | | | • | • | • | • | • | • | |
| Urology | • | | | | | | | • | | • | | |

Table VI. NCUs and NICUs in Italy

| Range of births/unit | Total birth units | Number of births | % | Mean number birth/unit | NCU | % | NICU | % |
|----------------------|-------------------|------------------|-------|------------------------|-----|------|------|------|
| 0-499 | 168 | 50 395 | 9.5 | 299 | 19 | 11.3 | 3 | 1.8 |
| 500-799 | 134 | 86 706 | 16.3 | 647 | 28 | 20.9 | 11 | 8.2 |
| 800-999 | 74 | 66 277 | 12.5 | 895 | 34 | 45.9 | 14 | 18.9 |
| 1000-2499 | 169 | 248 643 | 46.7 | 1471 | 109 | 64.5 | 76 | 45.0 |
| >2500 | 22 | 79 918 | 15.0 | 3632 | 20 | 90.9 | 20 | 90.9 |
| Total | 567 | 531 939 | 100.0 | 938 | 210 | 37.0 | 124 | 21.9 |

8 in private hospitals), and 214 neonatal intensive care units (NICUs), for those newborn babies who need intensive care and access to advanced technologies (119 are in public and 5 in private hospitals).

The NCUs and NICUs serve areas where the annual number of births varies from 0-2500 and greater. In order to assess the efficiency and quality of the neonatal care service provided, NCUs and NICUs have been divided by the Ministry of Health in 5 classes of neonatal centers defined by the annual number of births in each center.¹⁸ Table VI shows the distribution of NCUs and NICUs within these 5 classes. There are 168 birth units with less than 500 births/y, and in an effort to make the Italian neonatal care system further efficient and safe, the Ministry of Health announced a plan in 2015 for the progressive closure of these centers, and also a reduction and/or reorganization of the birth units with less than 1000 births.

As reported in Table VII, the data from the National Institute of Statistics show that the national fertility rate is 1.39 and the birth rate is 9.1, which has been declining since 2009, because of the progressive aging of the baby

boom generation of the 1960s.¹⁸ Although initially compensated by the immigrant population, such negative trend is now growing again. Table VII also shows infant and neonatal mortality rates, which have continued to decline at the national and regional level over the past 10 years.¹⁸ Figure 1 shows declining infant and neonatal mortality rates during the period from 1990-2011. Deaths within the first months of life are generally due to low birth weight, and prematurity and congenital malformations. After the first month of life, exogenous causes predominate, as they are related to hygienic, social, and economic factors impacting the mother and the child.¹⁸

Pediatric Preventive Care

Preventive care in pediatrics is typically defined as the prevention of disease and promotion of physical, mental, and social well-being of children with the aim of attaining a positive health.^{19,20} It includes antenatal preventive pediatrics (adequate nutrition, prevention of communicable diseases, preparation for delivery and breastfeeding, and mother craft

Table VII. Infant and neonatal mortality rates in Italy

| Neonatal demographics (data from the Italian National Institute of Statistics 2015) | | | | | | | |
|---|----------------------|------------|-------------------------|--------------------------------|---------------------------------|----------------------------------|------------------------|
| Regions | Total fertility rate | Birth rate | Children mortality rate | Neonatal mortality rate (<1 d) | Neonatal mortality rate (1-6 d) | Neonatal mortality rate (1-29 d) | Mortality rate (>1 mo) |
| Piemonte | 1.40 | 8.5 | 2.42 | 0.65 | 0.83 | 1.20 | 0.57 |
| Valle d'Aosta | 1.57 | 9.6 | 0.80 | 0.00 | 0.00 | 0.80 | 0.00 |
| Lombardia | 1.48 | 9.7 | 2.47 | 0.54 | 0.57 | 1.15 | 0.79 |
| Province of Bolzano | 1.60 | 10.5 | 0.00 | nd | nd | nd | nd |
| Province of Trento | 1.59 | 10.2 | 0.00 | nd | nd | nd | nd |
| Veneto | 1.44 | 9.4 | 2.79 | 0.66 | 0.58 | 1.11 | 1.02 |
| Friuli Venezia Giulia | 1.38 | 8.2 | 3.39 | 0.87 | 0.58 | 1.65 | 0.87 |
| Liguria | 1.29 | 7.3 | 3.76 | 0.92 | 1.25 | 2.42 | 0.42 |
| Emilia Romagna | 1.46 | 9.4 | 2.99 | 0.77 | 0.69 | 1.27 | 0.96 |
| Toscana | 1.36 | 8.5 | 2.51 | 0.71 | 0.67 | 1.20 | 0.61 |
| Umbria | 1.34 | 8.6 | 1.51 | 0.38 | 0.25 | 0.50 | 0.63 |
| Marche | 1.39 | 8.9 | 1.85 | 0.43 | 0.36 | 0.85 | 0.57 |
| Lazio | 1.41 | 9.4 | 3.22 | 0.98 | 0.77 | 1.53 | 0.72 |
| Abruzzo | 1.30 | 8.7 | 2.98 | 0.68 | 0.85 | 1.53 | 0.77 |
| Molise | 1.16 | 7.6 | 1.99 | 1.20 | 0.00 | 0.40 | 0.40 |
| Campania | 1.39 | 9.9 | 3.59 | 0.95 | 0.89 | 1.56 | 1.08 |
| Puglia | 1.30 | 8.9 | 3.04 | 0.40 | 0.94 | 1.67 | 0.97 |
| Basilicata | 1.17 | 7.7 | 4.34 | 1.08 | 1.08 | 1.95 | 1.30 |
| Calabria | 1.25 | 8.7 | 4.55 | 1.52 | 1.74 | 2.30 | 0.73 |
| Sicilia | 1.39 | 9.4 | 4.18 | 0.92 | 1.27 | 2.00 | 1.27 |
| Sardegna | 1.14 | 7.9 | 2.73 | 0.89 | 0.67 | 1.18 | 0.67 |
| Italy | 1.39 | 9.1 | 3.01 | 0.75 | 0.79 | 1.41 | 0.86 |

nd, no data.

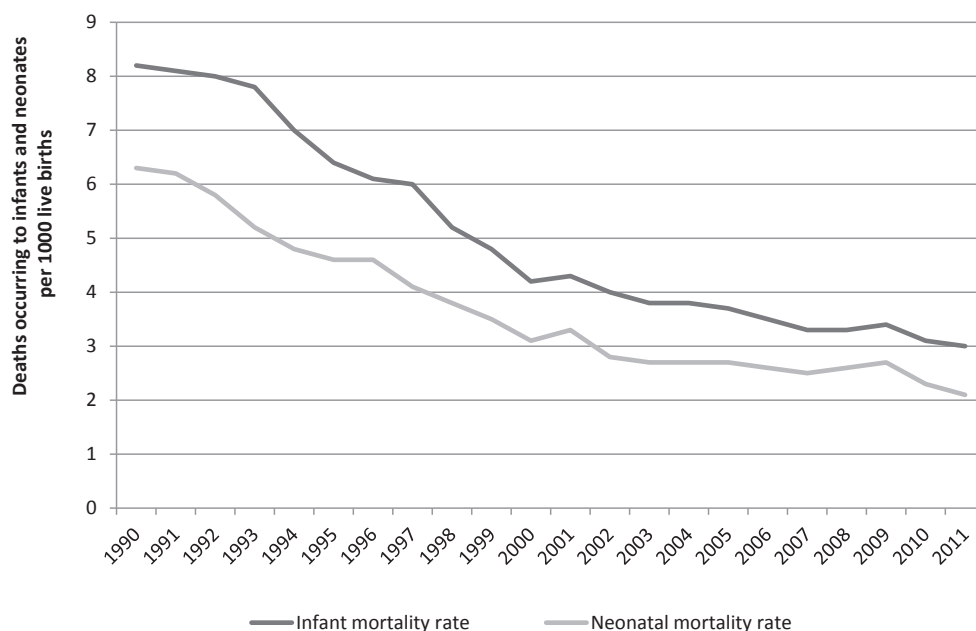


Figure 1. Infant and neonatal mortality rate. Italy: 1990-2011.

training), postnatal preventive pediatrics (promotion of breastfeeding, introduction of complementary feeding at an appropriate age, prevention of injuries, growth monitoring periodic health checkups, and immunization), and social preventive pediatrics, which promotes the application of principles of social medicine to pediatrics to obtain a more complete understanding of the problems of children to prevent and treat disease and promote adequate growth. In Italy, postnatal and social preventive pediatrics are delegated mainly to the family pediatricians. The family pediatricians may be partially involved in antenatal preventive medicine, together with obstetricians and gynecologists, dieticians, psychologists, and other professional caregivers who are part of dedicated tasks of specialists who assist the mothers during their pregnancy.

Italian family pediatricians are charged by the Ministry of Health to perform preventive medicine and care by following national and regional programs, which are designed in collaboration with the Ministry of Health, at the national level, and with the regional governments at the local level. Interactions with the families are further facilitated by medical booklets, as well as by a vaccination book, which are both kept by the parents. Routine checkup examinations are regularly scheduled during the year.²¹

Immunization Programs

Vaccinations are provided to children by the Ministry of Health free of charge and are administered in accordance to a recommended routine schedule (Table VIII). Data from the Ministry of Health²² report that with reference to the vaccinations

Table VIII. Recommended routine vaccination schedule in Italy (2015)

| Immunization schedule (Italian Ministry of Health 2015) | | | | | | | | | | | |
|---|-----------|--------|--------|--------|---------|---------|---------|-------|-------------|-------|------------|
| Type of vaccine | At birth* | 3rd mo | 5th mo | 6th mo | 11th mo | 13th mo | 15th mo | 5-6 y | 11-18 y | >65 y | Every 10 y |
| DTPa | | • | | • | • | | | • | • dTpa | | • dT |
| IPV | | • | | • | • | | | • | | | |
| HBV | • | • | | • | • | | | | | | |
| Hib | | • | | • | • | | | | | | |
| MMR | | | | | | | • | • | • | | |
| PCV | | • | | • | • | | | | | | |
| Men C | | | | | | | • | | • | | |
| HPV | | | | | | | | | • (3 doses) | | |
| Flu | | | | | | | | | | • | |
| Varicella | | | | | | | | | • (2 doses) | | |

dT, diphtheria-tetanus acellular (vaccine for adolescents and adults); dTpa, diphtheria-tetanus-pertussis acellular (vaccine for adolescents and adults); DTPa, diphtheria-tetanus-pertussis acellular; Flu, influenza vaccine; HBV, hepatitis B vaccine; Hib, haemophilus influenzae b; HPV, human papillomavirus; IPV, polio inactivated vaccine; Men C, meningitis C conjugated; MMR, measles-mumps-rubella; PCV, pneumococcus conjugated vaccine.

*Infants born to mothers who are hepatitis B surface antigen positive.

Table IX. Immunization coverage for recommended vaccinations in Italy

| Immunization coverage in Italy (%) 2000-2009 | | | | |
|--|------|---------|------|-------------|
| Years | IPV | dT/DTPa | HBV | MMR vaccine |
| 2000 | 96.6 | 95.3 | 94.1 | 74.1 |
| 2001 | 95.8 | 95.9 | 94.5 | 76.9 |
| 2002 | 95.9 | 96.8 | 95.4 | 80.8 |
| 2003 | 96.6 | 96.6 | 95.4 | 83.9 |
| 2004 | 96.8 | 96.6 | 96.3 | 85.7 |
| 2005 | 96.5 | 96.2 | 95.7 | 87.3 |
| 2006 | 96.5 | 96.6 | 96.3 | 88.3 |
| 2007 | 96.7 | 96.7 | 96.5 | 89.6 |
| 2008 | 96.3 | 96.7 | 96.6 | 90.1 |
| 2009 | 96.2 | 96.2 | 95.8 | 89.9 |

included in the national immunization plan, during the period 2000-2009, the immunization coverage increased with the exception of polio immunization (-0.4%). The coverage for obligatory diphtheria-tetanus or diphtheria-tetanus-pertussis increased by 0.9% and hepatitis B by 1.8%, all of them being above 95%. The immunization coverage for recommended vaccinations, such as measles, mumps, and rubella, has increased by 21.3% to 89.9% (Table IX).

Health Service Accreditation Programs

Accreditation is the most commonly used external mechanism for standards-based quality improvement in health care, and the use of accreditation at national level is a tool for organizational development and external assessment of

health services.²³ National accreditation systems are defined as programs that, at a national level, aim to provide accreditation services for primary care, community services, hospitals, or health care networks. These include statutory and voluntary bodies that offer organizational development through external assessment of health services by means of published service standards (ie, External Peer Review Techniques, project of the EU, 1996-1999, and the International Society for Quality in Health Care's new Agenda for Leadership in Programs for Health Care Accreditation Program). In countries where accreditation is mandated nationally, but is provided at regional level, as in Italy, regional programs are recognized and included in the evaluation process. In Italy, a national law has required accreditation to be established by all 21 existing regional governments, which will define their own model and standards based on national guidelines. The Italian accreditation system aims at selecting institutions and individual medical professionals responsible for providing health care services on behalf of the Italian National Health System.²³ The main duties of the Italian Regional Agency for Health Care include: (1) reviewing regional legislation, through a comparative analysis of requirements and procedures; (2) publishing documents illustrating the general features of the accreditation mechanism and presenting the current legislation; (3) supplying materials and documents for the elaboration of national guidelines; (4) monitoring the stages of development of the regional models; (5) supporting the regions in defining and implementing the accreditation process; and (6) providing communication and information tools.

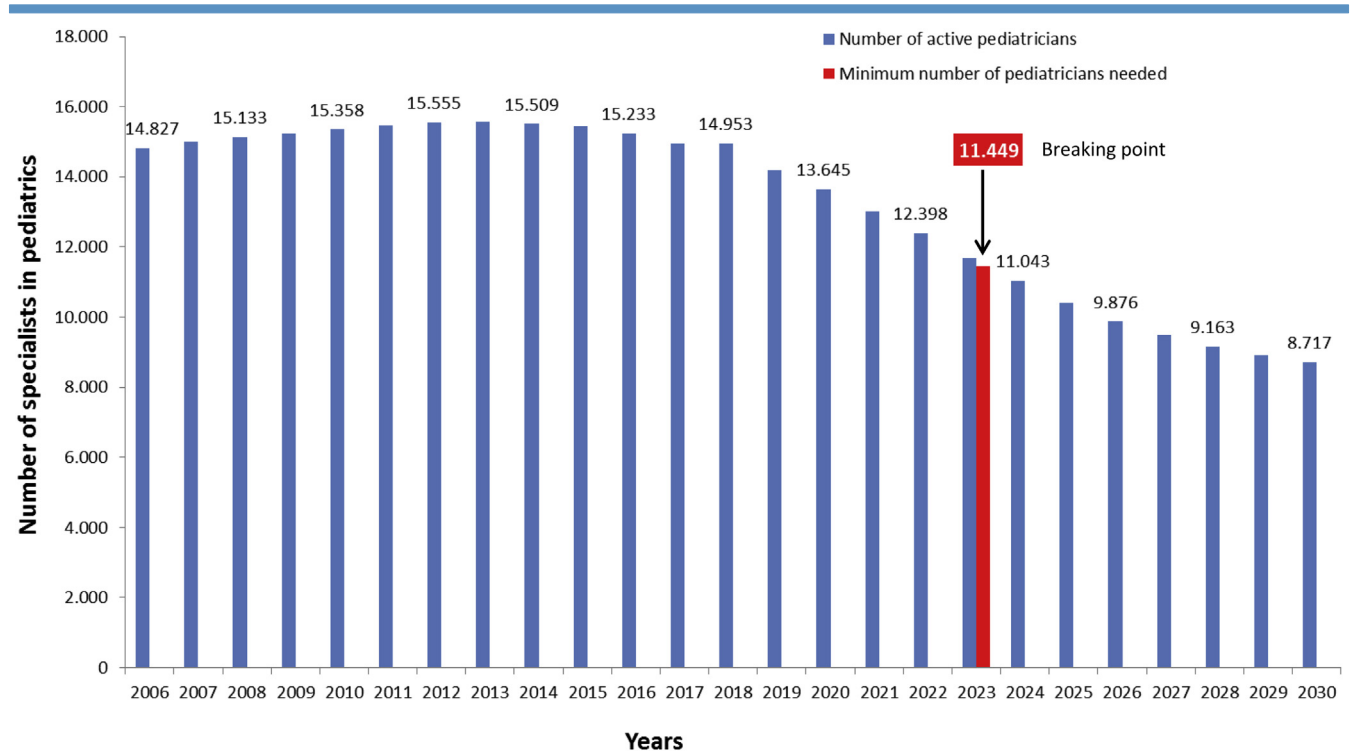


Figure 2. Number of specialists in pediatrics covering public pediatric health care services in Italy.

The majority of 21 Italian regions have set up an accreditation system or are in the process of doing so. These regional initiatives are monitored by the National Agency for Regional Health Services based in the capital, Rome.²³

Postgraduate Training in Pediatrics

In Italy, the postgraduate medical education in pediatrics follows the directions issued by the EU Commission Single Market Directive,²⁴ and it has recently been reformed accordingly, by the Ministry of Education.²⁵ Typically, the structure of the course in postgraduate training in pediatrics includes 3 years of training in general pediatrics (common trunk) and then 2 years of elective training and rotations in pediatric subspecialties, as well as research training and diagnostic skills training. The design and implementation varies among the academic pediatric training centers recognized by the Ministry of Education. Such educational structure is intended to ensure that general pediatricians are prepared for the diversity of clinical and social problems that they may encounter and receive sufficient training in rare and complex disorders.²⁶ There are no official educational programs in any pediatric subspecialty. However, following the postgraduate training in pediatrics, specialists in pediatrics may join academic and nonacademic pediatric hospital centers, where clinical training is provided in different pediatric subspecialty areas.

Strengths and Weaknesses of the Italian Child Health Care System

Strengths include: (1) pediatric care provided free of charge; (2) high parent satisfaction for PCP children care; (3) easy access to PCP offices (no waiting list) and hospital care; (4) high uptake of health promotion and prevention services; (5) PCPs offices providing high quality and efficient services; (6) free of charge or reduced cost services (eg, drugs); (7) stable annual income provided by the state to PCPs and hospital pediatricians (average of €100 000 before taxes); (8) favorable cost-benefit ratio of PCP system and positive impact on pediatric care^{9,15,16}; and (9) implementation of domiciliary care by the Ministry of Health.

Weaknesses include: (1) lack of training in primary care during pediatric training; (2) limited secretarial/nurse support for PCPs; (3) restricted choice of PCP by parents because of the limit of 1000 children/PCP; (4) heavy intrusion in clinical and research activities by hospital management; (5) lack of point-of-care diagnostics; (6) lack of trainees to replace aging pediatricians; (7) lack of support services for socially marginalized families (ie, immigrants); (8) fragmentation of child health care services; and (9) bureaucratic and administrative overload.

Conclusions

Pediatric care in Italy developed during the last 40 years based on the increased awareness of the importance of meeting the psychosocial and developmental needs of children and the

role of families in promoting the health and well-being of their children. The system is now in serious danger because of the current global and national economic crisis and a reduction in the pediatric workforce, generated by an insufficient recruitment of pediatricians. As of 2015, the Italian medical workforce in pediatrics is approximately 13 350 pediatricians, including approximately two-thirds PCPs and one-third pediatricians currently working in the PHUs of private and public hospitals and an additional 330 university pediatricians currently working in PHU of academic institutions or research centers. Projections made by the Italian Society of Pediatrics indicate that, based on the average number of 280 positions for postgraduate training education in pediatrics normally issued yearly by the Ministry of Education, the tipping point will be reached in 2023 (Figure 2), thereafter, Italy may face a significant deficit of pediatricians. The three main Italian societies of pediatrics, members of the European Paediatric Association, the Union of National European Paediatric Societies and Associations, do not favor solutions that will increase the role of GPs in child health care, because the pediatric training of GPs is highly insufficient to ensure high quality of services for children. Most recent policies adopted by the Ministry of Health show that pediatric health care system is still considered a factor of strength for the Italian Public Health System and governments. ■

Author Disclosures

The authors declare no conflicts of interest.

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