Preventive Child Health Care within the Framework of the Dutch Health Care System

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The Netherlands has established a high quality system of child health care based on a unique standardized digital preventive child health program underpinned by legislation. Stringent assessment of the implementation of the new Youth Act is needed to fulfill the United Nations' child rights to health. The impact of national child health care systems on the well-being of children with long-term conditions should be evaluated by using international (World Health Organization) comparable coding to document the benefit of preventive child health care programs and their outcomes. *(J Pediatr 2016;177S:S138-41)*.

The Netherlands is situated in the northwestern part of Europe. In 2014, The Netherlands had 16.8 million inhabitants, of whom 80% were native Dutch. It covers an area of 41 543 km^2, and on average, there are 408 people/km^2.[1,2] In 2015, there were approximately 3.3 million children 0-18 years of age living in The Netherlands. The Netherlands, with a gross domestic product of US $52 138 per capita in 2014, is ranked 12th out of 185 by the World Bank.[3] Neonatal mortality rate is still declining from 3.4 in 2005 to 2.6 per 1000 in 2013, but the mortality rate of children less than 5 years of age has remained at 4/1000 for the past 4 years (**Table I**).[4]

The Dutch health care system has undergone two major reforms in the last decade. In 2006, a long-standing political goal to combine the old sickness fund scheme and the voluntary private health insurance scheme was achieved.[5] Under the Health Insurance Act, all residents of The Netherlands are now required to have health insurance. At the start of 2015, a second major transition took place with the implementation of the Youth Act. On January 1, 2015, almost 400 municipal authorities assumed the responsibility from provincial and national institutions for services aimed at social care for children.[6]

Preventive Child Health (PCH) Care

Dutch PCH care has a long history. In 1901, the first child health clinic was founded in The Hague, and in 1904, the first school doctors were appointed by the municipalities of Zaandam and Arnhem to reduce illness by improving hygiene in schools.[7]

PCH care is now regulated under the Public Health Act 2008. The goals of the PCH program are to monitor growth and development, to detect health and social problems (or risk factors) early, to screen for metabolic conditions and hearing in the newborn, to deliver the national vaccination program, and to provide advice and information on health, growing up safely, and parental concerns of raising children. Over 90% of all children visit this free public service. For children older than 5 years of age, the preventive programs are performed in affiliation with schools and equally for children with learning problems attending special schools.

The preventive health care providers do not treat children, instead, they refer children with problems to primary health care where they are further assessed by general practitioners (GPs), physiotherapists, and speech therapists prior to additional investigation or treatment as necessary.

A national digital child record has been developed, which is designed to document care delivered by the national standard PCH programs. The file contains health and other relevant information about each child between 0 and 18 years of age.

Screening and Vaccinations

Metabolic screening is performed using a heel prick blood test, shortly after the birth of the child has been reported to the Municipal Civil Registry Office, by a professional from the PCH care or the midwife. The blood is tested by tandem mass spectrometry and other test methods for several diseases (**Table II**).[8] In March 2015, the Dutch Health Council recommended adding more diseases to the list (**Table III**). The screening program for sickle cell disease also reveals

GP	General practitioner
IT	Information technology
MMR	Measles, mumps, and rubella
PCH	Preventive child health
YHP	Youth health physician

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Table I. Population statistics

	1990	2000	2010	2012
Population, total (in million)	14.9	15.9	16.6	16.8
Population ages 0-14 y (% of total)	18.2	18.6	17.5	17.2
Population density (people per km^2)	442.9	471.7	492.6	496.7
Population growth (annual %)	0.7	0.7	0.5	0.4
Rural population (% of total population)	31.3	23.2	17.3	16.5
Life expectancy at birth (y)	76.9	78.0	80.7	81.1
Employment to population ratio, ages 15-24 y, total (%)	53	68.4	63	63.3
Unemployment, youth total (% of total labor force ages 15-24 y)	11.1	5.3	8.7	9.5

carrier status for both sickle cell disease and thalassemias. At present, the carrier status is considered to be an incidental finding of which the value seems unexplored by decision makers and unknown in primary care. It is not reported to the parents. The patient organization on sickle cell disease and thalassemia advocates for the right to know the carrier status in order to prevent future birth of children born with these severe diseases.

The National Vaccination Program (Rijksvaccinatieprogramma) covers diphtheria, tetanus, and pertussis; *Haemophilus influenzae* b; hepatitis B virus; measles, mumps, and rubella (MMR); meningococcus C; and pneumococci.[9] In 2012, the participation rates for the MMR, *Haemophilus influenzae* b, and meningococcal C vaccination were 96% and for the Tetanus-Diphtheria-Pertussis (acellular)-inactivated Poliomyelitis and pneumococcal vaccination was 95%. The participation among schoolchildren for Diphtheria-Tetanus-inactivated Poliomyelitis and MMR was 93%.[10] In 2013, a large measles outbreak occurred in the unvaccinated orthodox protestant population. Over 2600 patients with measles were officially reported. During the 9-month epidemic, 182 children were hospitalized and 1 child died from complications of measles.[11]

Pediatricians and Child Health Care

In 2015, 1300 pediatricians were registered in The Netherlands. Over 90% of all pediatricians work in hospitals; approximately one-half of them in general hospitals (secondary care) and one-half in university medical centers (tertiary care). The remaining 10% of pediatricians work in special care centers (eg, day care centers for children with special needs) or in public health institutes and social child health care services. Training in general pediatrics includes a mandatory internship in general hospital pediatrics, as well as in acute and subspecialist pediatrics. The GPs treat almost all uncomplicated health problems; as a consequence, Dutch pediatricians see few common child health problems.

In addition to pediatricians, there are approximately 1500 youth health physicians (YHPs) and nurses offering PCH care. Their training is dedicated to preventive and social care for the child and his/her family. YHPs are specifically trained in vaccination, growth and development, and screening of children for physical signs and symptoms of skin and eye abnormalities and other congenital anomalies. They work on average 23.4 h/wk (0.65 full-time equivalents). Thus, 1 single YHP takes care of 2255 children (1 full-time equivalent per 3468 children).

Table II. Economics statistics

	1990	2000	2010	2012
GDP (constant US $2005)	437.8	598	683.1	680.9
GDP growth (annual %)	4.2	3.9	1.5	−1.2
GDP per capita (constant US $2005)	29 283	37 546	44 110	40 639
Health expenditure per capita (current US $)	-	1931.7	5676.3	5737
Health expenditure, total (% of GDP)	-	8.0	12.1	12.4

GDP, gross domestic product.

Organization of Child Health Care Services

The child health care system is based on the child's rights to health and health care, equity, and social justice as the key elements of good care; however, translating these values into practice is a challenge for all countries, including The Netherlands. The national pediatric societies in the European Union aim to harmonize both the training and practice of general pediatricians. The effects of these international objectives are then influenced by national governmental decisions on the organization and financing of the national health care system. These decisions are not always made on evidence-based findings or on scientific knowledge with the risk of unintended consequences.

The recent implementation of the Youth Act in The Netherlands has potentially increased inequalities as the United Nations committee on child rights reported their concerns[12] that decentralization in The Netherlands may have created disparities in access between the different municipalities. It urged the Dutch government to ensure that children in all municipalities create equal access to high quality services that are provided in accordance with appropriate standards.

Collectively, chronic conditions and long-term disabling conditions are quite common, but they may have very different health outcomes because of a wide variety of social and environmental influences. Thus, primary, secondary, and tertiary care, as well as social care and education, must address these issues and work more closely together to improve outcomes.

Information technology (IT) has become a useful tool in communication among caregivers. It is common practice to use international coding systems, such as: *International Classification of Diseases,Tenth Revision*; *International Classification of Functioning, Disability, and Health*: *Children and Youth*; and *Systematized Nomenclature of Medicine*. An orphan code was designed to unify data collection and support national and international data exchange about rare diseases. All these tools may also have a positive effect on the participation of families in decision-making processes. Unfortunately, although The Netherlands was ahead in introducing IT in health, they now suffer from the many