

Child Development Programme in Singapore 1988 to 2007

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Abstract

Early childhood intervention programmes can shift the odds toward more favourable outcomes in development, especially for children at risk. However, there is no quick fix in the world for early childhood interventions. Programmes that work are rarely simple, inexpensive, or easy to implement. Each country must decide its own model and strategies and develop its resources based on existing infrastructures. Since its independence to become a sovereign nation in 1965, Singapore has undergone significant socio-economic changes. The infant and under-5 childhood mortality rates are among the lowest in the world. A number of “new morbidities” have been identified to pose major challenges to child health in the next decades. They are chronic medical illnesses, developmental disabilities, learning problems, injuries and neglect, behavioural disturbances and disorders, sequelae associated with unhealthy life-styles, and social and emotional disorders. The need for a comprehensive child development programme is therefore obvious. The main objectives are identification and treatment of children with developmental and behavioural problems so as to correct developmental dysfunctions, minimise the impact of a child’s disability or of prevailing risk factors, strengthen families, and establish the foundations for subsequent development. A child development programme has evolved in Singapore over the last 20 years. The programme is multi-disciplinary, community-based, family-focused, and child-centric, with partnership and integration between government and voluntary community organisations.

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The Basis of a Comprehensive Child Development Programme

Singapore is a small country without natural resources. Children are our nation’s most important resource and they are the future of our society. Since its independence in 1965, Singapore has enjoyed economic success and this is due primarily to the fundamental principle that Singapore’s continued prosperity depends largely on its people to maintain its competitiveness. The Singapore family size is small and its population is ageing. As such, great importance must be placed on health and well-being of the next generation.

In UNICEF’s report on “The State of the World’s Children 2007”,¹ Singapore was ranked first, together with Japan, Sweden and Switzerland, for the lowest infant mortality rates and under-5 mortality rates in the world in 2005. Childhood mortality rates in Singapore have fallen to very low levels and are now mainly associated with conditions

that modern medical care cannot affect. These include stillbirths of unknown cause, serious congenital malformations and genetic disorders, extreme low birth weight, serious accidents and cancers. This means that death rates are no longer adequate indices of medical care, particularly the traditional perinatal and infant mortality rates in relation to obstetrics, neonatal and general maternity care. Other population-based indices must be developed to enable proper evaluation of “how we are doing” as a community in the provision of holistic care to mothers and children. Furthermore, relative good health by usual statistical criteria may mist the awareness of subtle and soft issues that interfere with quality of life, especially for children. We must therefore guard against complacency and unawareness, which may deflect services and support away from the special needs of children and families, diffusing services and running into the risk of diluting or diminishing standards.

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A number of “new morbidities” have been identified to pose major challenges to child health in the next decades. They are chronic medical illnesses, developmental disabilities, learning problems, injuries and neglect, behavioural disturbances and disorders, sequelae associated with unhealthy life-styles, and social and emotional disorders. These problems are not new and they are inter-related. They are just becoming proportionately more significant and more prevalent in our maturing society. They emerge and become matters of concern when the more urgent demands of acute medical or economic conditions are met.

The need for child development and intervention/rehabilitation service in Singapore is therefore obvious. Furthermore, how a society cares for the disabled reflects the kind of society it is. The objectives of a comprehensive child development programme are early identification and treatment of children with developmental and behavioural problems so as to correct developmental dysfunctions, if possible, minimise the impact of a child’s disability or of prevailing risk factors, strengthen families, and establish the foundations for subsequent development. A disabled child will handicap the entire family. There is only a small window of opportunity and this is in the preschool years of the child. When our resource is limited and finite, the most cost-effective approach is to focus on early intervention rather than on late rehabilitation

Historical Perspective

Child development and rehabilitation services in Singapore have come a long way, and special education has been in Singapore for more than 50 years.²

In 1987, a Task Force under the then Singapore Council of Social Service conducted a review of the status of programmes and services for children with special needs in Singapore.³ It was not surprising to find that virtually all the services for the disabled, including special education and rehabilitation, were initiated by voluntary welfare organisations (VWOs). They were also entirely responsible for fund-raising. Therefore, historically, they have their own missions and a strong sense of ownership for their programmes and services. However, there were marked variations in the approach and the structure of their programmes with no common standards and poor coordination in service delivery. As a result, there were uneven distribution of caseloads and demands of services among the VWOs. The age group they served and the length of their programmes were variable and not comprehensive. Services were also limited and mainly rehabilitative rather than interventional, focusing on children with severe disabilities such as mental retardation, cerebral palsy and autism. Furthermore, no proper follow-up services were available after completion of the early rehabilitation

and long-term outcomes were completely unknown.

In many developed countries, developmental-behavioural paediatrics is already an established medical discipline. In Singapore, teaching and training of child development and developmental disabilities in our paediatric undergraduate and postgraduate training programmes remained fragmentary and received minimal emphasis. There was also hardly any serious research work in this field.

The Childhood Developmental Screening Programme was started in the Maternal and Child Health Clinics in Singapore in the mid-1980s. The Denver Developmental Screening Test (DDST), Singapore was then developed for the Singapore children. However, there is little point in having a community-wide system for early detection of infants and children suspected of having developmental and behavioural problems unless there are concomitant resources available for the comprehensive assessment of these young children, followed by appropriate management and care.

The turning point for a better-coordinated partnership to enhance the quality of programmes and services for the special needs population in Singapore was the report by the Advisory Council on the Disabled in 1988.⁴ Several recommendations with significant impact on the improvement of child development and rehabilitation services in Singapore were made. The government became an equal partner with the National Council of Social Service for the funding and management of special education. School buildings were leased out and land was set aside for the construction of purpose-built special schools. Financial support of up to a maximum of twice the cost of educating a primary school child was granted to a special child, matched by a similar contribution from the Community Chest of Singapore. The Advisory Council also recommended the setting up of a programme for the early identification and management of children with developmental problems.

The Development Assessment Clinic (DAC) was set up at Singapore General Hospital in 1991 as a pilot project with a block vote grant of 1.9 millions. In 1995, the Ministry of Health (MOH) approved the DAC as an established programme in public health service. The DAC was relocated to the old Kandang Kerbau Hospital in 1996. With the opening of KK Women’s and Children’s Hospital (KKH) in 1997, the DAC was renamed Child Development Unit (CDU).

However, continued funding of the child development programme remained an unresolved issue. In 2002, the MOH decided to fund the programme under the Health Service Development Programmes (HSDP) for 5 years. Two CDUs were then established at KKH and National University Hospital (NUH). While the diagnostic services

are hospital-based on initial referral, the intervention services would be community-based – one sited at the SingHealth Polyclinic at Health Promotion Board, under KKH; and the other at Jurong Polyclinic under NUH.

Principles of Child Development Programme

From the outset, the Child Development Programme has been committed to evolve and develop along certain basic principles. It should build on existing structures and strive to be sustainable. It should adopt a multi-disciplinary and team-based approach and encourage partnerships with professional bodies, consumer groups, schools, charities and VWOs, parent groups and associations. The MOH CDP would establish links and integrate its services with the social and community support programmes under the Ministry of Community Development, Youth and Sports (MCYS) and the National Council of Social Service (NCSS), as well as with the education programmes under the Ministry of Education (MOE). The services of CDP should be family-oriented or family-focused, and deliver in community-based settings. Its programmes must be evidence-based or follow the best practice guidelines, have a quality framework and can be evaluated. Hopefully, the programmes are flexible and replicable.

Components of a Comprehensive Child Development Programme

There are 5 main components in the referral process and management of a comprehensive child development programme, i.e.: locating children at risk, developmental screening, comprehensive developmental assessment, individual intervention programmes and continuing and follow-up evaluation.

Locating Children at risk

a. “At-risk” registers are established at the time of birth or soon after birth. Examples of high-risk infants are the preterm infants, children born with asphyxia and congenital abnormalities. Some children are at risk because of the family’s social background. e.g., teenage mother, single mother, substance abuse, poverty, etc. These are catered for by the Healthy Start Programme, linking at-risk families to community support services such as the Family Service Centres.

The concept of “at risk” registers is to ensure the close monitoring and assessment of those most likely to be developmentally delayed. The limitations of such registers must be acknowledged. Many developmentally delayed children do not have any identifiable aetiological or risk factors, and many children who have suffered clear identifiable insults, and are very much at risk, develop quite normally. Furthermore, the inclusion of all possible risk factors necessitates large numbers of

children being placed on the “at risk” registers, making the concept logistically difficult and practically impossible most of the time. The clear advantages of early diagnosis must be counterbalanced by the dangers of inappropriate labelling. Nevertheless, the “at risk” registers maintained by the neonatal departments in the public sector serve to ensure that the high-risk populations, such as the very-low-birth-weight infants or those who have experienced perinatal stress, can be closely monitored.

b. Getting children to attend playgroups, nurseries and other preschools by 2 years of age will provide early opportunities of exposure to learning, together with relevant challenges to developmental skills and social interactions.

VWOs, religious and ethnic community groups, together with Community Development Councils, have programmes to pro-actively seek out families with children in the preschool age not attending any preschool setup between 2 and 3 years old. They will provide social and financial support to get these children to preschools.

Developmental Screening

Developmental screening is aimed at providing pre-symptomatic detection of disability by examining apparently healthy children serially to determine whether they are developing normally. Community health workers, particularly maternal and child health nurses and family physicians, are uniquely placed to detect developmental problems at an early stage.

In Singapore, the DDST Singapore has been adopted as a validated formal screening procedure.⁵ Potential problems of screening programmes include variable knowledge and skills, as well as attitude, among those healthcare workers doing the screening.⁶ Another challenge is that children and families with the highest level of possibility of developmental problems are sometimes the least likely to avail themselves to the services.

To improve our system of child search and locating children at risk, the CDU has been involved in the review and design of developmental surveillance checklists and questionnaires based on the validated items in the DDST (Singapore). These have been included in the revised standardised Health Record Books for children, available to all children born in Singapore. Parents will play the central role in monitoring a child’s health and development. This method of developmental surveillance has been extended to involve preschool teachers who will be the caretakers of children once they are in the playgroups, nurseries or kindergartens.

Screening can only indicate that a child may have a

problem that should be further investigated. It cannot describe definitively the nature and extent of a dysfunction or disability. Screening should not be used to label children as being delayed, nor can it be used to develop intervention strategies. Screening must be followed by comprehensive assessment to confirm or dismiss the suspicions raised by the screening procedure.

Comprehensive Developmental Assessment

The purpose of a comprehensive developmental assessment is to accurately determine a child’s developmental status in a number of domains. It will include a search for the cause(s) of the delay, although most of the developmental problems remain uncertain or idiopathic in aetiology even after the best possible search. A complete assessment is a complex procedure. It is often time consuming and is expensive. Therefore, it should be carefully planned. A multi-disciplinary team coordinated by a trained paediatrician as case manager is required to obtain a thorough understanding of the child’s abilities – his weaknesses and strengths. The number and type of professionals that are involved may vary, but a “core” team is usually involved in every assessment, the features of the delay in a child will suggest which specialty groups need to be involved.

Individualised Care Plan and Follow-up

The diagnosis and confirmation of a child’s developmental and behavioural problems should be followed by the process of planning for intervention and rehabilitation strategies, which should be individualised and specifically tailored to the child. Any eventual intervention plan must involve the parents as a focal point, so their participation in the entire process is of paramount importance. Subsequently, a follow-up evaluation system should be in place to monitor the progress of the child and the family and to provide continuing care and support.

Current Role of the Child Development Unit

The CDU functions as the national referral centre for the assessment and management of infants and children with developmental and behavioural problems. It is uniquely positioned to serve children in their preschool years, and it complements the existing nationwide childhood developmental screening programme. Before the establishment of DAC/CDU, the care for this group of children with special needs, aged 0 to 6 years, had been inconsistent and poorly coordinated. By the time these children reached primary schools, their developmental problems and disabilities would have gone undetected or been ignored for too long, and any late rehabilitative attempts would be very difficult or futile. They would also develop secondary disabilities related to relationship

problems with peers, school failure, loss of self-esteem, and family dysfunction, with devastating consequences. Figure 1 depicts the detection and screening processes and the sources of referral to the CDUs.

Currently, the CDUs at KKH and NUH receive between 1200 and 1400 new referrals per year. The figure is very close to the projected estimation that about 3% of the annual births (about 40,000 annual births in Singapore in the last few years) will require the care of the early child development service. It is important to note that this represents the pattern of developmental problems amongst the preschoolers. It does not represent disability at this stage. Disability will only follow if these early childhood developmental problems are not being looked into or are totally ignored, allowing the dysfunctions to perpetuate and deteriorate with development of secondary consequences. The estimate may, however, represent only the tip of the iceberg.

The number of follow-up medical consultations is between 4000 and 5000 per year. About 90% to 95% of these children are in their preschool ages and their first referral to the CDU is usually between 2 and 3 years of age. About 85% to 90% of the referrals are from the primary healthcare services, i.e., polyclinics and family physicians. Other referrals are from the paediatric services in the public and private sectors. In addition, the CDU also provides consultation and assessment service for children from the region.

We would like the teachers in the childcare centres and the preschools to be equipped with skills in the early identification of children with developmental problems under their supervision and be knowledgeable in the process of referral. In this respect, the availability of the revised Health Books will be of great help in providing them with the user-friendly method in the early detection process. However, we strongly encourage parental participation and encourage them to seek help as early as possible.

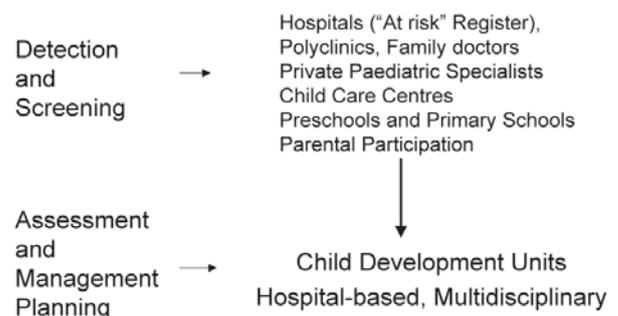


Fig. 1. Developmental screening and assessment.

The multi-disciplinary assessment at CDU will arbitrarily channel the children into 4 categories of management strategies, based on our available resources. The 4 categories are used for local funding purposes and are not internationally accepted classification.

A. Children with Low-prevalence High-severity Developmental Problems

These are children with mental retardation, global developmental delay, severe cerebral palsy, classical autism, and multiple handicaps. They require early placement in special schools where they receive appropriate special training and education. The role of CDU is mainly assessment, diagnosis, followed by family counselling and management planning. There will be minimal commitments in intervention and therapy for these children at the level of CDU, except for some parental guidance sessions before they are enrolled into the appropriate schools. The medical staff will continue to provide medical treatment to these children if they subsequently present with developmentally-related medical problems, such as self-injurious behaviour and hyperactivity.

The initial projected number of children in this category was about 20%, and it was also reflected in our earlier experience with the DAC. As we gain experience and confidence, together with concurrent improvement in social, community and educational supports through our collaborative and advocacy efforts with MCYS, NCSS and MOE and with the families, the number of children in this category has declined to between 10% and 12% among the annual new referrals. This has been most encouraging as it has wide implications on the needs to build more special schools for these children if the proportion remains high or increasing. This is clearly the most significant benefit of the early childhood intervention programme under the CDU.

B. Children with High-prevalence Moderate-severity Developmental Conditions, Fair Prognosis with Early Intervention and Therapy

These are children with severe attention deficit hyperactivity disorder, high-functioning autistic spectrum disorder, severe learning disability, and other moderately severe motor, sensory and behavioural problems

C. Children with High-prevalence Low-severity Developmental Conditions, Good Prognosis with Early Intervention and Therapy

These are children with inattention, mild learning disability, speech and language delay, problems in special senses (hearing and visual problems), mild cerebral palsy with intact intelligence, and other mild behavioural problems.

Children in B) and C) have intellectual capabilities

within the normal range but are limited by their individual developmental and behavioural disabilities. They should never be sent to special schools in the first place. The challenge is early identification of these developmental differences so that they can be successfully integrated into regular preschool education with their peers, through appropriate intensive intervention and therapy. They should be well prepared to proceed to mainstream education. The combined efforts of the child development and rehabilitation service, the schools, and the families are crucial in ensuring the success of the treatment programmes for these children.

Children in categories B (approximately 40%) and C (approximately 30% to 35%) constitute between 70% and 75% of the annual referrals.

D. Children with Developmental Delay and Behavioural Problems with no Apparent Biological Basis, Excellent Prognosis with Early Intervention (10% to 15%)

These are children with definite developmental and behavioural problems and they are entirely environmental in nature (nurture). Their problems are reversible when detected at early age, but the children will remain at-risk if the adverse environmental factors are not corrected. The parents should have the primary responsibility for the well-being of their children. However, they need guidance and assistance in dealing with a child with developmental problems.

Figure 2 illustrates the flow of intervention and management for children with low-prevalence high-severity developmental problems (Category A). The majority will continue to require placement in special schools.

Table 1 shows the different types of low to moderate severity but high prevalence developmental problems diagnosed under categories B, C and D. They made up 85% of the annual cases going through the CDUs. They should not be placed in special schools in the first place. The most appropriate placement is in the integrated, least restrictive and inclusive preschool environment and be provided with therapeutic interventions, educational support as well as

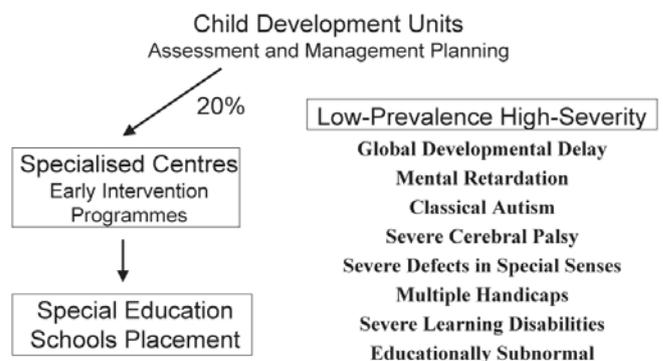


Fig. 2. Low-prevalence high-severity problems.

Table 1. High-Prevalence Low- and Moderate-Severity Developmental Problems

High-functioning autism spectrum disorder
Asperger syndrome
Attention deficit hyperactivity disorder
Learning disabilities
Mild cerebral palsy with intact intelligence
Speech and language disorders
Other motor, sensory and behavioural problems
Developmental delay from environmental factors

social and community support. The care provision is therefore community-based, child-centric and family-focused, with the services one step closer to the doorstep of the families. This is the most important group of children where early intervention will produce the most optimal outcomes, negating future needs of setting up even more special schools to cater to their needs as they grow up. This is in fact the main objective of the establishment of CDU and the child development programme (Fig. 3).

Networking of Child Development and Rehabilitation Service

To provide an optimal child development and rehabilitation service, and to benchmark its standards against some of the well-established programmes in the developed countries, the works of CDU will be quite limited without the contributions and participation of related community and education services.

CDU has already established good working relationships with the following services, but we need to further develop and strengthen the bonds between each component:

1. Primary and community health services in both public and private sectors.
2. Schools and organisations providing special training and educational service for children with special needs.
3. Preschools (child care centres, nursery schools, kindergartens) and mainstream primary schools.
4. Community clubs and professional societies to provide outreach education and training for the public and parent groups.
5. Liaison with regional and international child development centres.
6. Collaboration with consumer groups with interest in child development, e.g. Launching of Touch Therapy (infant massage) to the Singapore public, as well as sponsorship of public education events.
7. A good working relationship with the media is also important in dissemination of news on the CDU activities and child health information to the public.

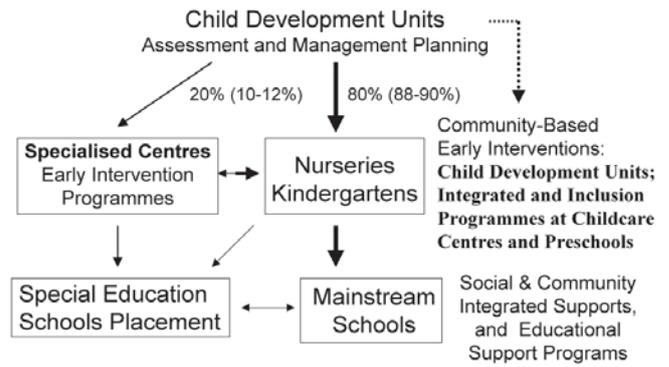


Fig. 3. Individualised management plan and placement.

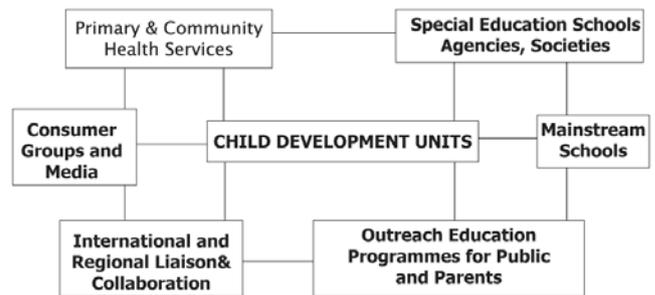


Fig. 4. Networking of child development units with related services in the community.

Figure 4 summaries the relationships of the essential components of the child development service network.

Pattern of Developmental Problems in Preschoolers

Table 2 shows the pattern of developmental problems in preschoolers seen at the CDUs at KKH and NUH from 2004 to 2006.

Autism spectrum disorder is the leading diagnosis of children seen at CDUs. This is followed by speech and language problems. Therefore, about 50% to 60% of children have problems and difficulties in communications.

The increased identification of children with autism spectrum disorder is attributed to increased awareness of this condition, the widening of its definition under DSM IV (revised), as well as improved methodology of diagnosis.

The high prevalence of these disorders is also due to the fact that the CDUs cater to children in their preschool age between 0 and 6 years old. This is also the main objective of CDUs—to identify children with developmental problems in their preschool years so that early interventions can be offered in the most cost-beneficial ways.

The prevalence of learning disabilities and attention deficit hyperactivity disorders is below 10% among our preschoolers. The reason for this is that these problems will

Table 2. Patterns of Developmental Problems in Preschoolers in Singapore (CDU 2004-2006)

Developmental problems	2004	2005	2006
Autistic spectrum disorders	508 (29%)	361 (27%)	461 (28%)
Speech and language delay/disorders	417 (24%)	376 (28%)	485 (29%)
Global developmental delay	289 (17%)	198 (16%)	230 (14%)
Learning problems/disabilities	126 (7%)	131 (10%)	152 (9%)
Behavioural problems	106 (6%)	108 (8%)	136 (8%)
Attention-deficit-hyperactivity disorder	103 (6%)	56 (4%)	72 (5%)
Environment-related delay	74 (4%)	32 (2.5%)	26 (1.6%)
Motor developmental delay	45 (3%)	36 (2.8%)	56 (4%)
Cerebral palsy	34 (2%)	17 (1.3%)	10 (0.8%)
Syndromic disorders	29 (1.5%)	17 (1.3%)	8 (0.5%)
Impairment of special senses	9 (0.5%)	1 (0.1%)	1 (0.1%)
Total	1740 (100%)	1333 (100%)	1637 (100%)

only surface in the later part of the preschool years or even in the primary school years, when children are systematically challenged with academic tasks and expose the differences in their individual learning styles. As these children progress into their school years, both these conditions will be identified with increased frequency. This is well illustrated in the published statistics by the US Department of Education under the Individuals with Disabilities Education Act (IDEA), where specific learning disabilities were featured eminently as the leading disability among students aged between 6 and 21 years who required special education services (Table 3).⁷

The relatively low prevalence in the diagnosis of cerebral palsy, visual and hearing impairments is indicative of the improvement and excellence of perinatal care in Singapore. Even when children have these conditions, the majority of them can be successfully included and integrated into mainstream schools.

It is also the experience of the CDUs that the number of children under category A has stabilised from the initial projection of 20% to between 10% and 12%. This can only be achieved with the continued establishment and improvement of early intervention infrastructures in the community and would require the close collaboration between the services from the MOH, MCYS and MOE.

In the follow-evaluation of children under the CDU, it has been consistently shown that between 85% and 90% of children demonstrate improvement in their performance and functional skills. This is the assessment from both professionals and parents, and the improvement has been uniform across all the 4 categories.

It is important to emphasise that these encouraging results are not achieved by the CDUs operating in isolation

but with the development of many initiatives in education, social and community supports.

Providing Quality Education for All

Education is an important component in the jigsaw puzzle of a comprehensive child development programme. It is the key enabler in imparting to our children the values, skills and knowledge needed to thrive in a rapidly changing world. With the implementation of the Compulsory

Table 3. Number of Students Ages 6-21 Who Received Special Education Services Under the Federal Government's Disability Categories (2003-2004 School Year)

Developmental problems	No.	%
Specific learning disabilities	2,816,361	47.2
Speech or language impairments	1,118,543	18.8
Mental retardation	570,643	9.6
Emotional disturbance	482,597	8.1
Other health impairments	449,093	7.5
Autism	140,473	2.3
Multiple disabilities	151,225	2.2
Hearing impairments	71,188	1.2
Orthopaedic impairments	67,772	1.1
Developmental delay	65,878	1.1
Visual impairments	25,284	0.4
Traumatic brain injury	22,459	0.4
Deaf-blindness	1,603	<0.1
All disabilities	5,963,129	100

Source: US Department of Education (2004). Individuals with Disabilities Education Act (IDEA).

Education Bill (2000) in 2003, all children must attend at least 6 years of primary education in national schools.

While the focus of managing a child with developmental problems has been on correcting the child's dysfunctions, the child's strengths must not be lost. It is important that any intervention strategy should include a strong emphasis on the ongoing identification of the child's strengths, his affinities, potentials, and talents in which he can achieve a sense of mastery and triumph. Athletic skills, artistic inclinations, creative talents, and mechanical aptitudes are among the potential assets of certain students who are underachieving academically. These children need help and opportunities to develop their talents, to build on their natural and acquired proclivities, and to achieve respect and praise for their efforts. Such efforts are likely to be critical in working toward the enhancement of self-esteem. These potential assets can have tremendous long-term implications for the child's transitions into young adulthood, including career choices.

The CDU collaborates with the MOE to ensure a smooth transition of the children under our care from preschools to the mainstream environment. The CDU organises annual forum with the Psychology and Guidance Services of MOE for parents with children with special education needs to facilitate early communications between the families and the schools. Thereafter, the CDU continues to play the important advocacy role when these children are in the mainstream schools.

CDU took part in the revision of the Health Education Course Books and Workbooks for school children from Primary One to Primary Six. In a step-wise manner, children are taught, and learnt together with their parents, the arts and science of growth and development, healthy lifestyles, family values, and social behaviour.

Through research works with VWO such as the Singapore Children's Society, surveys were conducted on situations of bullying in schools. Based on actual research findings, a series of anti-bullying campaigns will be started in the schools from 2007. Having peers in schools who are receptive, understanding and accommodating to some of the eccentric behaviours of children with special needs is one of the key factors for educational success for these children.

In 2005, the MOE has undertaken a review of measures to cater to children with special needs, in both Special Education (SPED) schools and mainstream schools.⁸

Initiatives to enhance support for SPED schools include:

- a. Providing additional funding to improve the quality of professional resources in SPED schools by helping the SPED schools to recruit better qualified teachers, providing better professional development for the staff

and improving the curriculum design;

- b. Building additional SPED schools to cater to children with autism. The Singapore Autism School in Jurong was opened in September 2005, taking care of the children with the severe form of autism who are not able to attend mainstream schools. The St Andrew Autism School has also started to cater to the needs of teenagers with autism.
- c. Increasing support for SPED school infrastructure, by accelerating and completing the development of purpose-built SPED schools by 2008 and providing additional development funding. The Spastic Children's Association of Singapore has been rebuilt to become the Cerebral Palsy Centre in Pasir Ris in 2004. Balestier Special School of Rainbow Centre has recently completed its move from the former premise and reopened. Chao Yang School and Jervois School under the Association for Persons with Special Needs, taking care of children in the educationally subnormal range, have moved to Ang Mo Kio.

Initiatives to enhance support for mainstream schools include:

- a. Increasing resources to enhance current early detection, intervention and support programmes for students with mild to moderate levels of special needs to cope with the regular school curriculum and to remain in the mainstream schools and do well.
- b. Designating mainstream schools to have dedicated staff known as Special Needs Officers (SNOs) with training in special education to provide a combination of in-class support and specialist intervention to children with learning disabilities.
- c. Training in special needs will also be provided for selected mainstream teachers across schools. This will raise general awareness of different types of learning disabilities and help teachers identify and manage children with mild learning disabilities. Over the next 5 years from 2005, about 10% of teaching staff in all schools will be trained to enable them to better support students with special needs in their respective schools.

MOE will set aside S\$55 millions a year till 2008 for the implementation of these initiatives.

Starting in 2007, certain primary schools have been identified to be equipped with appropriate staff to cater to and to support children with autism and dyslexia. The Dyslexia Association of Singapore (DAS) will be provided with fund to allow early testing of preschool children suspected of having learning disabilities so that early intervention can be started to make these children better prepared as they enter mainstream primary schools.

The Learning Support Programmes (LSP) in primary schools will be broadened to provide remedial support to

pupils who lag behind in their academic capabilities. The schools are also providing opportunities for children with special education needs to be included with their peers in the less restrictive learning environment.

Social workers are deployed to the schools to provide professional social supports to pupils and to establish links between families in need to the relevant community resources, such as the family service centres.

In 2006, the MOE has announced a major adjustment in the education policies that will provide many paths for students to grow and develop. The Prime Minister has emphasised that “*Every child’s talent is valued*”, and that “*No child would be left behind*”. The vision is to “*build a mountain range with many peaks of excellence*”.

From 2008, primary school pupils will not be streamed into EM1, EM2 and EM3 bands. Instead, depending on their innate strengths, they will study subjects at different levels of difficulty – the Standard level or the easier Foundation level. Therefore, there is shift from a “fixed” menu to the subject-based “a la carte” menu of study. With more flexibility in the curriculum, catering to the different abilities of students, instead of a “one size fits all”, students who struggle in schools will not be so easily discouraged and be stigmatised, and leave the school system prematurely as a result. These changes in our educational approach will allow many children with different developmental problems to be included in the mainstream schools, supported by trained teachers and integrated with their peers in their learning experiences. The target is to halve the current school dropout rate at primary and secondary school levels from 3% to 1.5% by 2010.

Pathlight School will offer mainstream primary school curriculum for children with mild to moderate autism but do not have adequate social and communication skills to allow them to cope in the usual mainstream primary schools. Several education tracks are designed according to the academic capabilities and behavioural competencies of these children.

In 2007, Northlight School was set up with the mandate to engage and to continue to provide learning opportunities to teenage, premature primary school leavers or those who have not done well in the Primary School Leaving Examination (PSLE). The emphasis is to assist them to set aside their past academic failures, allow them to discover their individual strengths, maintain their self-esteem, and encourage character development and vocational training.

To provide greater educational pathways and to recognise different talent and widen the definition of success, the Singapore Sports School was started in 2004, and the School of the Arts will open its door in 2008.

The next big frontier is preschool education. The literature

consistently suggests that early intervention through a high-quality preschool education can help make up for deficiencies in home environments by way of ensuring school readiness. Yet, figures in 2006 showed that 5% of children entering primary school have not attended preschool at all. To ensure that all our children can have a good start in life, the government will work with various agencies to get as many children as possible into preschool or kindergarten.

Social and Community Support

The social safety net in Singapore is a unique “Many Helping Hands” approach, which involves the partnership of all sectors of the society and the government. The many helping hands consist of the MCYS, NCSS and Community Chest (its fund-raising arm), Community Development Councils, VWOs, philanthropic organisations and Foundations, religious and ethnic community organisations, financial corporations and consumer groups, as well as parent support groups and associations. The principle is to foster self-reliance. Family remains the primary line of support, including financial and emotional support. The emphasis is social assistance, not welfare.

Although Singapore enjoys a generally good standard of living, there will always be some families who miss out on the benefits of prosperity and their children’s basic needs are not being met. *Supplementary services* are available to provide tangible financial or other material help to families. In addition, supplementary helps targeted specifically at children’s needs are also available. The Community Care (ComCare) Fund was launched in 2005, with half of the fund catering to programmes for children from disadvantaged families. Singapore Press Holdings sponsored the School Pocket Money Fund, which raised large sums for distribution to ensure, among other things, that poor children can afford food at school during recess. Many voluntary organisations also have funds that can be tapped to supplement needs for school expenses. The ethnic community organisations – Chinese Development Assistance Council (CDAC), Mendaki and the Association of Malay Professionals, Sinda and Eurasian Association, serving Chinese, Malays, Indians, and Eurasians respectively – all have educational focus. Besides financial assistance, they also provide low-cost tuition to school children as well as parent education. A “Fairy Godparent” project and the Kindergarten Financial Assistance Scheme (KiFAS) are programmes that offer financial assistance for lower income families to send their children to preschools. The National Trade Union Congress (NTUC) has also set up the Childcare Bright Horizons Fund for similar financial aids to needy families with children going to preschools. Other schemes such as the “Back-to-Work” Child Care

Scheme are also available to allow mothers from low or no income families to seek employment by helping them with the expenses of placing their children in childcare centres.

Supportive services are social service provisions that strengthen the capacity of parents to fulfil their roles more effectively. Many families, including the normal functioning families, require supports to enable the social functioning of adults in their parental roles. These include affordable housing and healthcare services; job availability, training and re-training; family-friendly workplaces, affordable quality childcare facilities for working parents, and recreation facilities.

When both parents work and when care by other family members is not available, alternative affordable and quality care arrangements by non-family members become necessary. While there are alternative care by foreign domestic workers and family day care providers who take care of a small group of children in their own home, child care and student care centres are some of these services that families have come to rely upon as more mothers join the work force.

Childcare centres cater for children from infancy up to the age of 7 years as a service for working parents and fees are subsidised. Childcare centres are licensed by the MCYS to ensure not only the children's safety and well-being, but also their learning and development. However, childcare centres should be doing more than just taking care of children alone. A number of these centres have also expanded their services to include parenting education, parent support services, as well as public education programmes for families with children under their care. The emphasis is to encourage parental participation in the care of their children.

Student care centres cater for primary school children who have no adult at home when they return from school or before they go to school. These children may be lonely and bored and may seek distraction outside the home such as frequenting shopping centres and getting involved in undesirable activities with questionable company without their parents' knowledge. Student care centres provide a place where these children can have a proper meal, do their homework and engage in recreational activities under supervision of adults.

An extensive network of family service centres (FSCs) is available in Singapore to offer general family-oriented programmes, ranging from parent education, to family counselling and student care. Some FSCs may have special programmes to meet the needs of children and their families. For example, in "Healthy Start" programme, the FSCs work closely with the staff of hospitals with maternity service, which identify families at risk of social problems as early as at the time of delivery of the newborn infants. A

long-term supportive relationship is then established with the at-risk family to ensure that the child's developmental needs, health checks, preschool enrolment are attended to; while assisting the family with other possible issues such as employment, budgeting, and marital relationship. Other voluntary welfare agencies also offer supportive help to families where the children have problems in the family or in school, or are on the verge of delinquency.

An Integrated Childcare Programme (ICCP) has been initiated by MCYS and is available in selected childcare centres. These centres have teachers who are specially trained to address the learning and social needs of the child. Working together with the parents and the healthcare professionals, the teachers will develop an individual education plan for each child and monitor the progress regularly. The children are placed in classes appropriate to their age and functional level. The physical classroom environment is also designed to cater to children with special needs, and specially designed teaching materials may be used. They will join in all or most of the activities of their classes, with trained teachers at hand to provide them the extra guidance and help.

The aim is to provide an appropriate learning environment for young children aged 2 to 6 years with mild to moderate levels of developmental problems as well as to provide opportunities for them to interact with other children in a natural setting. This way, the child will be better able to adjust when he or she subsequently goes into mainstream primary school. These children come mainly from the CDUs after their assessment.

A Disability Information and Referral Centre (DIRC) has been established to function as a central registry for children with developmental problems who require intervention services in specialised centres and to streamline the referral processes. This is in tandem with the setting up of several new Early Intervention Centres strategically located in the community in order to cater to the needs of the children and their families as near to their doorsteps as possible.

In 2004, a nationwide KidsRead Programme was launched by the National Library Board at the Community Libraries. This programme provides an early opportunity for children between 4 and 8 years old, especially those in the lower-income families, to be exposed to appropriate reading materials.

The Assistive Technology Centre has been set up at Society of Physically Disabled (SPD) to improve the learning and employment opportunities for persons with special needs.

In 2007, MCYS initiated the Enabling Masterplan 2007-2011, looking into service gaps in early developmental interventions, financial counselling for families with

children with special needs, and also preparing for transitioning into adulthood, which would include issues of post-secondary education, future employment and residential alternatives.⁹ This will see even closer collaboration between the relevant Ministries and the VWOs in Singapore.

A wide-ranging plan has been proposed to reach out to children and adults with disabilities, as well as the people who care for them or employ them, so that shortfalls in services for these groups will be plugged over the next 5 years. Essentially, a child, from infancy to 6 years of age, undergoes subsidised early intervention programmes to enhance their language, communication and motor skills. Lower-income families will get bigger subsidies. Family will obtain a grant to be trained in specialised care giving. The child is assessed for placement in a mainstream or specialised school, whichever is appropriate. He/she shares in activities jointly organised by mainstream and special schools. Upon graduation, a young person with disability will undergo vocational assessment and placement tailored to his/her disability. National bodies such as the NTUC's Skills Development Institute give training, based on industry needs. Persons with disability will find jobs and become self-sustaining. Hostel living trains him/her to be independent and smaller-sized group homes where he or she can receive rehabilitation and care will be available.

The Road Ahead for Child Development Programme in Singapore

The establishment and continued development of the DAC in 1991 at SGH and then the CDU at KKH in 1995, together with its extensive networking with related services in the community have given the children of Singapore a comprehensive early child development service of reasonable standard. We have an evolving community-based model that builds on existing infrastructures, with inter-Ministry involvement, and integration of the medical, educational and social services.

Certain critical factors have been identified as keys to a favourable outcome. Firstly, we must have parents who are dedicated and committed, have reasonable expectations and never give up hope on their child. Secondly, we must have schools that are receptive, accommodating and dare to give the child a chance to learn. Thirdly, there must be peers who are understanding, accepting and forgiving of some of these children's apparent eccentricities. The role of the professionals are mainly to provide an early diagnosis, identify the child's strengths and weaknesses, treat the child as being different rather than being abnormal, guide the parents, and advocate for the rights and best interests of the child. By putting this jigsaw puzzle together, we will have an optimal child development programme.

What would be the focus of approach in the next lap for CDU and the Child Development Programme?

1. Strengthening its relationships with related resources in the network. It has taken us more than 10 years to establish and to maintain such a relatively extensive network, involving different Ministries, Statutory Boards and VWOs. The CDUs should continue to function as the referral and coordinating centres for child development, especially in early childhood development.
2. The niche and forte of the CDUs would be in the area of providing comprehensive child developmental assessment, planning management strategies for the child, follow-up care and outcome management, advocacy, as well as training and education. The scope of services provided by the multi-disciplinary team of child development professionals shall have its emphasis on initial stabilisation of the clinical conditions, initiation of evidence-based innovative and creative approaches in the management of the children's developmental problems, ensuring smooth transition to care in the community, research, and possibly to act as a supervisory or advisory agency where required, such as the Therapy Hubs and the Early Intervention Centres being set up. The diagnostic services would continue to be hospital-based at KKH and NUH, where the availability and the access to the whole host of subspecialties would enable a comprehensive assessment of the child's condition and his needs. The intervention and follow-up care would continue at the existing community-based sites at SingHealth Polyclinic at Health Promotion Board for KKH CDU, and at National Healthcare Group Jurong Polyclinic for NUH CDU.
3. There is a world trend in the changing emphasis in the approach to early childhood intervention. There has been a shift of decision-making power on caring for the child from being professional-centred to family-centred care. There is also a shift in the emphasis of intervention from disability to functional and developmental performance, participation and quality of life. Finally, shifting of the settings in the delivery of services and care to the least restrictive, more natural and more inclusive environment, namely the childcare centres, preschools and schools, homes, and the community. Both the CDUs are already developing along this direction.
4. Encouraging parental commitment in the prevention and management of children with developmental and behavioural problems. The family is the most powerful and pervasive influence and the constant in a young child's life. Families know certain aspects of their children better than anyone does. Families should have the greatest vested interest

in seeing their children learn. The family is likely to be the only group of adults involved with the child's educational programme throughout his/her entire learning journey. Finally, families must live with the outcomes of decisions made by education teams all day, everyday. Therefore, for any child development programme to succeed, professionals must work in collaboration with families to address the child's needs in a way that is consistent with the priorities of the entire family. The principles of family-centred approach therefore include empowering the families, providing social supports, building relationships with families, and building and maintaining effective communications. Going forward along this approach, parents should therefore continue to be primarily responsible for their children's optimal growth and development. However, we recognise the fact that it is not easy to be good parents in our modern society, and the task is even more daunting when it comes to parenting a child with developmental problems and disabilities. To this end, the Foreign Domestic Work Levy concession has been extended to families with disabled members. And a caregiver training grant will be starting in 2007 to empower these families. Currently, there is a dearth of information on many childhood developmental and behavioural problems and their management. CDU would like to position itself to become an important resource and information centre for the parents and the public. This is also in line with the world trend in encouraging parental participation in the issues of child development.

5. Focusing on the high-prevalence low-severity group of children with good potential intellectual functioning. This will cover 80% to 85% of the annual new referrals to the CDU. The CDU will work closely with the families and the preschool centres to formulate individual management plans so that these children will receive both intensive early intervention and regular education at the same time, without being separated from their peers. For the low-prevalence high-severity group of children, especially those assessed to be low-functioning; they will be referred to the special schools after diagnosis and counselling. CDU will be able to provide the VWOs with accurate statistics on service demands so that they can carry out proper planning on expansion of existing programmes or initiation of new projects.
6. To maximise the utilisation of limited resources in intervention, especially in overcoming the severe shortage of therapists, training funds and scholarships have been set up to increase the supply of these professionals, while efforts have been doubled in overseas recruitment. In the meantime, two "Therapy

Hubs" under NCSS have been set up to provide intervention services to the northern and southern regions of Singapore. A strategy has been developed to provide out-reach services to the children at the childcare centres and preschools, which are deemed to be the most natural environment for the children to learn, so that therapists and psychologists can establish closer outreach working relationship with the teachers and the families. In time to come, the Therapy Hubs can further develop to become Professional Centres for Early Intervention where professional standards can be established and maintained. They would also provide clearer professional career development paths for these group of healthcare professionals.

7. It must be recognised that any programme on child development and rehabilitation is an investment into the future and requires considerable commitments in community resources. The availability of trained staff is the single most important key factor for the success of the programme. With competing demand for scarce specialists like psychologists, therapists, developmental paediatricians etc., adequate funding may not guarantee that such manpower are available to provide optimal care.
8. While increasing the number of staff at all levels appears to be a straightforward solution, it cannot be achieved satisfactorily in the short term. Shortage of trained professionals in the field of developmental paediatrics and child health is a global challenge and Singapore is not alone. Frequent complaints and pressure to shorten wait list can be demoralising to the staff who have been working very hard to meet the needs of the families. While addressing the wait list is one of the priorities of the CDUs, we must be aware of a rapidly expanding private market of childhood intervention. This is based on supply and demand and is very attractive and lucrative. Unfortunately, this is a market that is poorly regulated and maintenance of professional service standards and competencies have not been in place. The CDU therefore should shoulder additional responsibilities in setting appropriate professional standard, in playing role models and to have a strong voice in advocacy in the best interests of the child.
9. Perhaps, one of the most important but difficult roles the CDU must assume is that of advocacy. Advocacy means that the healthcare professionals take the child's part and plead his cause with others. The healthcare professionals are uniquely positioned to encourage the schools and parents to understand and be responsive to the child as a whole. Parents must be helped to reshape, rebuild and to adjust their view of the child. Through judicious letter writing on behalf of the child and by

close interaction with the school, teachers and principals should be helped to understand the plight of the underachieving youngsters and those with developmental difficulties. They may need to argue strongly for the child to receive and benefit from certain remedial and educational services in the school. There is also a need to represent the rights of the child to ensure that he is not overexposed to criticism and humiliation in front of peers.

Paediatricians can also perform advocacy by becoming vocal citizens of their communities. Their roles include educating the community on the implications and the special needs of children with developmental disabilities, taking part in policymaking and resource allocation, and initiating appropriate multi-disciplinary programmes for the child and the family. Promotion of volunteerism would increase the pool of talents and expertise available nationwide to contribute to the work of child development and well-being. Ultimately, the adult world should be convinced to shift their mindset to concentrate less on disease, defect, damage or disability, but to recognise the diversity of styles, a wide range of strengths and weaknesses, and consequently the multiplicity of end products or pathways representing mastery. The educational philosophy and services should be broadened to allow for the dignity and development of such differences.

10. Funding of the child development programme has always been a recurrent issue. The programme has been funded by a block vote grant from the Advisory Council on the Disabled initially, followed by the HSDP, and will be under the Reinvestment Funding of MOH till 2012. Additional funding will come from the Enabling Masterplan 2007-2011 for specific programmes. Therefore, the programme must be sustained on a more permanent basis and the services must be properly consolidated and institutionalised. Only when this happens would it go a long way in encouraging the younger generation of paediatricians and allied health professionals to commit themselves in taking up developmental medicine as their life-long career.

Conclusion

Early childhood intervention programmes can shift the odds toward more favourable outcomes in development, especially for children at risk. There are successful strategies, especially programmes that emphasise child-focused educational activities and parent-child interaction, and governed by specific practices matched to clear goals.

However, there is no quick fix in the world for early childhood interventions. Programmes that work are rarely simple, inexpensive, or easy to implement. Changing the developmental trajectory of a young child growing up in an adverse environment and with developmental problems requires determination, persistence, and patience. Poorly designed and half-hearted services delivered by staff who are inadequately trained, poorly motivated and overburdened with heavy caseloads may generally cost less but are unlikely to produce significant benefits. Knowledge-based interventions that are funded sufficiently and delivered by trained and committed staff with appropriate skills can produce important outcomes that generate substantial returns on the investment.

Each country must decide its own model and strategies for early childhood interventions and develop its resources based on existing infrastructures. Singapore has taken almost 20 years to evolve a reasonable and credible community-based child development programme. Definitely, more needs to be done and the best is yet to be.

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REFERENCES

1. The State of the World's Children 2007. The United Nations Children's Fund (UNICEF) 2007. Available at: URL: <http://www.unicef.org/sowc07>. Accessed 20 June 2007.
2. Tham JSY, Lyen KR. The development of special education in Singapore. In: Lee EH, Tham JSY, editors. Rainbow Dreams. Singapore: Armour Publishing, 2002.
3. Report of Review of programmes and services for people with special needs in Singapore. Singapore Council of Social Service, 1987.
4. Opportunities for the disabled: Report of the Advisory Council on the Disabled. Singapore: Advisory Council on the Disabled, 1988.
5. Lim HC, Ho LY, Goh LH, Ling SL, Heng R. The field testing of Denver Developmental Screening Test Singapore: a Singapore version of Denver II Developmental Screening Test. *Ann Acad Med Singapore* 1996;25:200-9.
6. Lian WB, Ho SKY, Yeo CL, Ho LY. General practitioners' knowledge on childhood developmental and behavioural disorders. *Singapore Med J* 2003;44:397-403.
7. US Department of Education 2004, Individuals with Disabilities Education Act. Available at: URL: <http://idea.ed.gov/>. Accessed 21 August 2007.
8. Enhancing support for children with special needs. Ministry of Education 2004. Available at: URL: <http://moe.gov.sg/press/2004>. Accessed 18 September 2007.
9. The Enabling Masterplan, Ministry of Community Development, Youth and Sports, 2007. Available at: URL: <http://www.mcys.gov.sg>. Accessed 12 February 2007.