



Research Report

**INTEGRATED SERVICE DELIVERY IN THE TDSB'S
MODEL SCHOOLS FOR INNER CITIES:
THE CASE FOR SCHOOL-BASED VISION AND
HEARING SCREENING**

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Integrated Service Delivery in the TDSB's Model Schools for Inner Cities:
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EXECUTIVE SUMMARY

Evidence of Needs

Research findings from medical literature and data collected by the Toronto District School Board (TDSB) point to two critical facts about the vision and hearing conditions of students in high needs communities.

1. Students from low-income urban areas have a much higher rate of *undetected* visual and/or auditory problems than the general population. Many of these inner city students who do undergo screening require referral for corrective measures or medical follow-up. The high referral rate has to do with the multiple barriers (e.g., lack of OHIP coverage or access to family physicians or paediatricians, language or cultural barriers, family difficulties, money concerns, etc.) these students and their families have to face in acquiring regular health care. **This points to the importance of offering school-based vision and hearing screening services for students in high needs neighbourhoods.**
2. For many inner city students, screening and referral alone would not be sufficient. Many do not or could not receive follow-up attention on their own due to the similar set of barriers mentioned above. **This calls for a comprehensive school-based vision and hearing program that also offers immediate follow-up services** (e.g., dispensing eyeglasses, further assessments) to ensure students' previously unrecognized sensory problems are corrected and addressed.

Vision and Hearing Screening in TDSB's Model Schools for Inner Cities

In light of the above findings and concerns, between 2007 and 2011, the TDSB piloted a vision and hearing screening program in over 100 Model School's for Inner Cities (MSIC) elementary schools for Junior Kindergarten to Grade 8 students. Nearly 45,000 screenings were conducted during the four year period. The screening result for each year consistently shows a significant proportion of these inner city children requiring referral in vision (over one quarter, especially for the Grade 3s and up) and/or in hearing (around 15%). In other words, a high percentage of these inner city students have undetected sensory impairment, which could have hampered their learning progress in school on top of their already challenging situations.

Fortunately, with the relatively low-cost, school-based vision and hearing screening and follow-up services offered in these inner city schools, thousands of students have been diagnosed, referred, and followed up with corrective measures, and have thus been prevented from falling

through the cracks or from falling further behind. Furthermore, not only can the early screening, assessment, and treatment of hearing and vision problems prevent possible misdiagnosis or placement of students in special needs classrooms, the screening results can also be valuable baseline information for future reference should learning and/or other health issues arise.

Call for Government Funding and Support

So far, this successful pilot initiative has relied solely on private donations. The board, however, realizes that such essential integrated health efforts would not be sustainable in the long run simply through fundraising and private donations. Hence, **the TDSB is calling upon the Ministry of Health, the Ministry of Children and Youth Services, and the Ministry of Health Promotion for inter-ministerial funding and support for the school board to provide sustainable vision and hearing screening and follow-up services for students in high needs communities.**

The following lists the specific funding requests for a 3-Year Vision and Hearing Screening Clinics Program that will serve our growing number of MSIC schools.

Year 1 (2011-12): To serve 128 schools, approximately 60,000 students

- \$20,000 from the Ministry of Health to provide optometrist examinations for non-OHIP covered children and youth
- \$40,000 to provide optician services (cost share) to fit and dispense eyeglasses - all delivered on school site

Year 2 (2012-13): To serve 157 schools, approximately 80,000 students

- \$40,000 from the Ministry of Health to provide optometrist examinations for non-OHIP covered children and youth
- \$100,000 to provide optician services (cost share) to fit and dispense eyeglasses, all delivered on school site
- \$20,000 for ongoing research of hearing and vision assessment and treatment impact
- \$40,000 to cover the cost of eyeglasses and hearing aids

Year 3 (2013-14): To continue to serve 157 schools (plus any schools identified as having “pockets of poverty”)

- \$200,000 permanent inter-ministerial funding to the MSIC Program to ensure children are screened, referred if necessary, given appropriate high quality medical care, and provided with free glasses and/or other necessary aids, and, further to continue to develop the model of integrated service delivery within the context of under-served communities across Toronto.

With the working model already established in the TDSB’s MSIC, along with stable funding and support from the provincial government, we believe that not only can this integrated health and educational initiative benefit our inner city children, it can also:

- meet several key targets of Ontario government’s *Poverty Reduction Strategy*;
- maximize public dollars for service delivery that is both effective and preventative - ‘Public money for public good’;
- easily be expanded to include other important health care and infection prevention measures (i.e., immunizations, TB tests, newborn care etc.); and
- be replicated province-wide, or wherever there are communities struggling with poverty (i.e., urban centres or rural districts).

INTRODUCTION

In 2007, as part of its Model/Cluster Schools for Inner Cities (MSIC) initiative¹, the Toronto District School Board (TDSB) piloted a vision and hearing screening program in a number of MSIC schools. In the ensuing three years, the screening program expanded to over 100 MSIC schools (all located within high needs neighbourhoods) for Junior Kindergarten (JK) to Grade 8 students. Nearly 45,000 screenings were conducted during the four year period, and the result each year consistently shows a significant proportion of these inner city children requiring referral for corrective measures or medical follow-up in vision (over one quarter) and/or in hearing (around 15%). This means that a high ratio of these inner city students have undetected sensory impairment, which could have hampered their learning progress in school on top of their already challenging situations. This finding is concerning.

Nevertheless, it is encouraging to see that with relatively low-cost, school-based vision and hearing screenings along with immediate follow-up services offered in these inner city schools, thousands of students have been prevented from falling through the cracks or from falling further behind. Furthermore, not only has this early screening, assessment and treatment of hearing and vision problems helped prevent possible misdiagnosis or placement of students in special needs classrooms, the screening results have also become part of the baseline information for future reference should learning and/or other health issues arise.

In light of the positive experience of this school-based health initiative in the past four years, **the TDSB is calling upon the Ministry of Health, the Ministry of Children and Youth Services, and the Ministry of Health Promotion for inter-ministerial funding and support for the school board to continue to provide sustainable vision and hearing screening and follow-up services for students in high needs communities.** This is one of the crucial pieces to ensure equitable opportunities for all students, regardless of their socio-economic background, to achieve to their best potential.

¹ MSIC is an innovative JK – Grade 12 school program focused on supporting inner city children and youth in reaching their highest academic, emotional, physical, and social potential, within the context of their families and school communities. The MSIC program is unique in that its purpose is to address the needs of the whole child, which is important because children in poverty face many barriers outside of school. In 2010-2011, there were 112 MSIC schools - 105 elementary and seven secondary.

EVIDENCE OF NEEDS

What the literature is telling us

Vision Screening

According to the Canadian Association of Optometrists (1998), at least 80% of learning occurs through vision, and yet, in general “one in six children has a vision problem that makes it difficult to learn and read.” A search of medical literature further indicates that in the United States, whereas “approximately 20% of the American schoolchildren have a vision problem, children from low-income urban areas have more than twice the normal rate of vision problems” (Ethan, Basch, Platt, Bogen, & Zybert, 2010). Other U.S. studies also suggest that not only do these “low income children have a disproportionate amount of vision problems, [they also] ... face several barriers to acquiring vision care” (Ethan & Basch, 2008). For instance, children from low income urban areas “are less likely to have a family physician, less likely to be receiving regular care, and less likely to have Ontario Health Insurance Plan coverage. They are more likely to speak a primary language other than English and have greater mobility rates all of which result in a decreased likelihood of attending vision screening”. Guttman (2001) reported that low income children are less likely to consistently use the same health care provider, and less likely to see a paediatrician or other health care specialist.

Another notable finding from a number of studies in England and the U.S. points to the importance of vision examination for different age groups of schoolchildren. According to their optometric research, certain eye impairments such as amblyopia are more common among pre-schoolers, while refractive errors (such as myopia) most likely develop between 8 and 12 years of age (Logan & Gilmartin, 2004). This is reiterated in other studies which report a higher rate of vision abnormalities among the older age groups than the 5 year-olds (Spowart, Tappin, & Kerr, 1997; Yawn, Lydick, Epstein, & Jacobsen, 1996).

While there is a lack of robust research exploring the relationship between vision and learning, a study conducted by Ohio State University College of Optometry concludes that “visual performance was significantly related to reading performance even in children of average intelligence when IQ was partially controlled” (Kulp & Schmidt, 1996). Another U.S. study on vision problems of children in poverty in an urban school clinic reports that “students treated in the school’s eye clinic had demonstrated improvements in teacher grades and standardized reading and math tests” (Orfield, Basa, & Yun, 2001).

Hearing Screening

In terms of hearing, a recent Canadian article published in the Paediatrics and Child Health Journal states that “hearing loss in infants and children has been linked with lifelong deficits in speech and language acquisition, poor academic performance, personal-social maladjustments, and emotional difficulties” (Wang, Bovaird, Ford-Jones, Bender, Parsonage, Yau & Ferguson, 2011). Other research has confirmed how “hearing loss can lead to developmental delays and educational problems for some children” (Ross, Holstrum, Gaffney, Green, Oyler, & Gravel, 2008). And “when hearing loss goes undetected, the resulting language deficits can become overwhelming obstacles to literacy, educational achievement, socialization, and school readiness” (Eiserman, Shisler, Foust, Buhmann, Winston, & White, 2008).

In 2002, Ontario introduced the Universal Newborn Hearing Screening Program, which has been able to identify most children born with congenital hearing loss. However, as noted by Wang et al. (2011), there is some congenital hearing loss that may not become evident until later in childhood. Furthermore, hearing loss can occur beyond the newborn period due to “infectious diseases ..., trauma, damaging noise levels and ototoxic drugs” (Wang et al., 2011). Moreover, such a universal newborn hearing screening cannot capture the many immigrant children in our inner city schools who were not born in Canada. Indeed, similar findings can be gleaned from the U.S. literature. Although most newborns in the U.S. are also being screened for hearing loss, a paper shared by the Centers for Disease Control and Prevention points out that “a large fraction of cases of unilateral hearing loss and mild bilateral hearing loss are not ... identified through newborn hearing screening” (Ross et al., 2008). Cohort studies in England also show that “the prevalence of permanent childhood hearing loss continues to increase through infancy” (Bamford et al., 2007). According to a Virginia Department of Education Task Force report, “11% of primary grade children were identified as ‘at risk’ for possible hearing loss” (Cluver & Hodges, 1990).

What our TDSB data and our MSIC experience are telling us

TDSB Census Findings

According to the Board's *2008 Parent Census* of elementary school students (JK-Grade 6), there are indeed discrepancies among parents of different income bracket groups in reporting that their child's eyesight or hearing had been tested by a doctor. For instance, while over three quarters of the parents from the two highest income categories reported that their child had their vision assessed, the same was true for less than two-thirds of their counterparts from the two lowest income groups (O'Reilly & Yau, 2009).

Vision and Hearing Screening Initiative

Between 2007 and 2011, in response to the concern raised by teachers, principals, and parents, the board launched a large-scale vision and hearing screening program in more than 100 of its MSIC elementary schools. With the facilitation of the Toronto Foundation for Student Success (TFSS), financial and in-kind supports were secured from philanthropists and private institutions to allow tens of thousands of students in high needs communities to have their eyesight and hearing checked by health care professionals from the Canadian Hearing Society and by immigrant doctors who were seeking accreditation in Canada. Due to the limited, though generous, funding from private donations, only students recommended by their teachers or principals were screened – mostly students who were identified for special needs assessment, and/or children who were in their first year in Canada. Table 1 shows the statistics of these inner city students screened and referred for the last four school years.

Table 1: Hearing and Vision Screening and Referrals in Model Schools for Inner Cities, TDSB (2007-2011)

	2007-2008 (Pilot)	2008-2009	2009-2010	2010-2011
Total no. of elementary students screened	4,159	10,125	12,102	16,931
Hearing screened	1,611	8,692	6,525	6,863
% referred	15%	13%	16%	15%
% referred based on universal screening	n/a	14%*	n/a	n/a
Vision screened	1,951	9,753	11,330	15,844
% referred	23%	30%	29%	27%
% referred based on universal screening	n/a	27%*	n/a	28%**

*This referral rate was based on six MSIC schools which had every student screened in 2008-09.

**This referral rate was derived from a universal screening conducted in 2010-2011 for all Grade 5 and 7 students from over 100 MSIC schools.

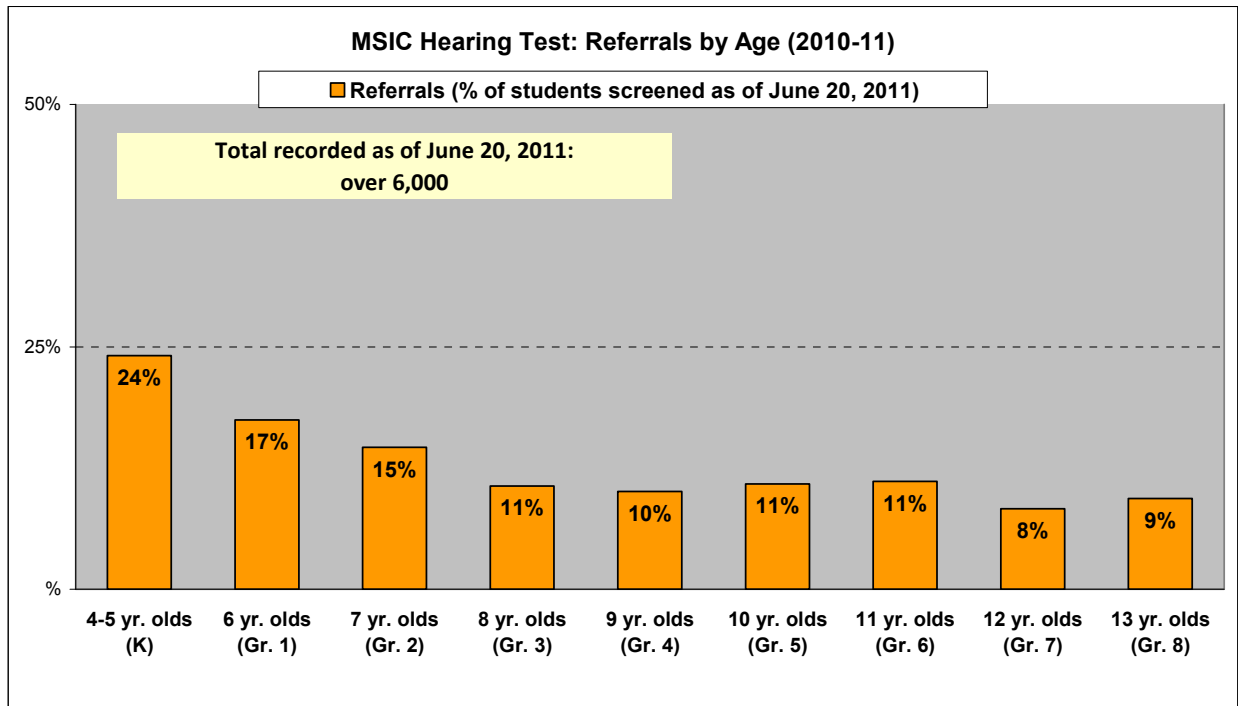
Hearing: Screening Results and Referrals

Nearly 25,000 hearing examinations were administered between 2007 and 2011. Consistently, between 13% and 15% of the students screened over the last four years required referrals.

This means that approximately 1 in 6 or 1 in 7 of the students in these high needs neighbourhoods have undetected potential auditory problems that require medical follow-ups.

With this large-scale auditory assessment, it has been found that hearing referral rates seem to *decrease* by age with the highest rate among Kindergarten students (1 in 4)² (see Figure 1.) By Grade 1 and 2, the rate has dropped to 1 in 6 or 1 in 7. From Grade 3 onwards, the rate seems to have levelled off to about 10%.

Figure 1: Hearing Referrals by Age, 2010-11



² The hearing referral rates for younger children are often higher due to their susceptibility to ear infections or colds leading to a higher frequency of physician referrals.

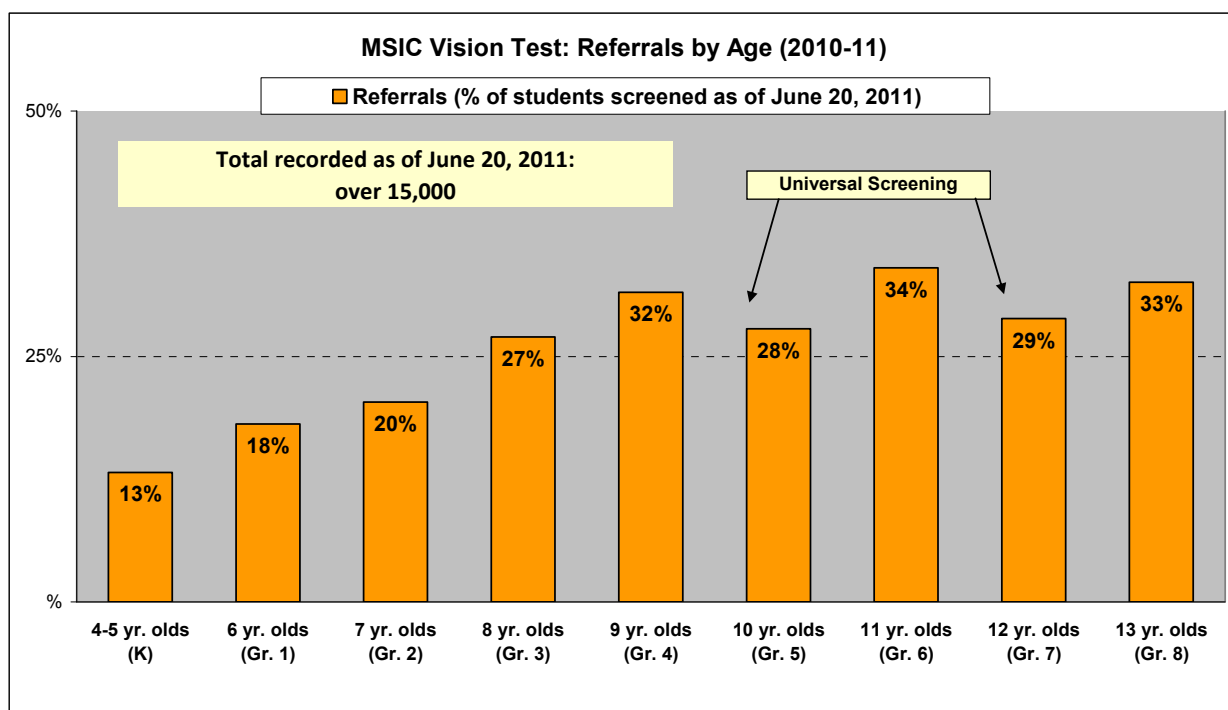
Vision: Screening Results and Referrals

At the same time, nearly 40,000 vision tests were performed over the four years. Except for the first pilot year, between 27% and 30% of the students screened in the last three school years required referrals for corrective measures or further medical follow-up. In other words, **at least 1 in every 3 or 4 students screened in these communities has undetected visual problems, which have likely hindered their learning capability and educational potential.** This ratio is significantly higher than the average rate (1 in 6) reported by the Canadian Association of Optometrists (1998).

In order to estimate the “true prevalence” of vision and hearing problems among students in these high needs communities, universal screening was conducted for a few defined groups of students (due to funding constraints). In 2008-09, six MSIC schools were selected where every student was screened. In this limited round of universal screening, 27% (1 in 4) of the students were identified with potential vision problems and 14% (1 in 7) with potential hearing difficulties (Wang et al., 2011). In 2010-11, a wider-scale universal vision screening was conducted for two defined age groups – the ten year-olds (Grade 5) and the twelve year-olds (Grade 7) across all 100+ MSIC schools. Of the nearly 7,000 Grade 5 and 7 students screened, a similar proportion (28%) required referrals. In other words, more than 1 in 4 of these junior and senior level students have unrecognized vision problems.

Another interesting finding from this large-scale vision screening is that, contrary to the auditory screening results, visual problems *increase* with age among schoolchildren. As illustrated in Figure 2, junior (Grade 3-6) and senior (Grade 7-8) level students have a significantly higher referral rate than the primary level students (JK-Grade 2). This echoes the literature findings that the rate of children’s visual defects normally rises by age.

Figure 2: Vision Referrals by Age, 2010-11



Aside from MSIC elementary schools, a pilot screening was conducted in a MSIC secondary school for the first time in spring 2011. Of the 272 students examined in the pilot secondary school vision clinic, as many as 62% required glasses or a prescription change. More than 160 eyeglasses were dispensed. Even more concerning, five students – all of whom struggled academically – were discovered to be legally blind. These pilot secondary school screening results, together with the data collected from the 4-year hearing and vision assessments in MSIC elementary schools, clearly point to the seriousness of this basic health issue among inner city students.

Follow-up Services

Fortunately, problem identification is not the only goal of this MSIC health initiative. During the process, it was discovered that for many inner city children, screening and referral itself was not sufficient. As cited earlier in the U.S. literature, there are multiple barriers to inner city children being able to receive follow-up attention. “These barriers include a lack of medical insurance coverage³, lack of accessible transportation, inability for parents to take time off from work, and lack of family financial resources to follow interventions prescribed by health care providers (e.g.,

³ It was found unexpectedly that a notable proportion (about a quarter) of our inner city children were without proper medical coverage (either without OHIP or with invalid OHIP information) – which partially explains why their visual and/or hearing problems had remained undetected. In these cases, funds were secured by the MSIC to pay for the optometry appointments of children who did not have health coverage.

filling prescriptions for glasses or hearing aids)... [and] a lack of confidence in navigating the health care system due to cultural and language barriers, especially in new immigrants” (Wang et al., 2011). A study by Kimel (2006) identified four categories of barriers to follow-ups: financial (e.g., money concerns, lack of insurance, waiting for insurance), logistical (e.g., problems making appointments, difficulty planning ahead, lack of car or phone), social/family barriers (e.g., all household adults work, family is large, parents themselves face challenges, unstable living arrangements), and perceptual (e.g., do not believe results, not a priority, no need for an exam, no interest in follow-up). Another study by Yawn, Kurland, Butterfield, and Johnson (1998) lists other barriers: low community knowledge about refractive errors in children, parental perception of poor communication between schools and parents, high costs of lenses, inconvenient appointments, and children not wanting to wear glasses.

To overcome some of these barriers, MSIC has incorporated vision follow-up services into its health effort. This has allowed most students who required further vision assessment to be served at school-based optometry clinics, which brought in optometrists and opticians with portable equipment to school locations for 1-4 week blocks of time. Neighbouring schools organized their students and parents to attend these optometry appointments at ‘host’ schools. School-based dispensing clinics were also made available, where free eyewear was selected by children who needed it, and these glasses were then dispensed to the children by an optician at each school within 1-3 months (Toronto Foundation for Student Success [TFSS], 2010). As a result of this integrated effort, thousands of free eyeglasses were dispensed.

However, hearing follow-up has posed more challenges, as “families of children who required further hearing assessment were asked to visit their own physician; or, if a re-screen by an audiologist was needed, they were asked to make an appointment on their own with the Canadian Hearing Society” (TFSS, 2010). As mentioned earlier, due to the many barriers, one is not too optimistic about the follow-up rate for those who have been referred for further hearing examination. Indeed, according to the TFSS 2009-2010 Report, “Tracking the results of the physician and audiologist referrals was extremely difficult”,⁴ and only 25% of all hearing referrals could be tracked. This unexpected finding has triggered the TDSB to pilot school-based paediatric health clinics in two MSIC schools in partnership with local health agencies, and eventually to set up one for each of the seven MSIC clusters across the city.

⁴ This had to do with the fact that families were encouraged to secure these services on their own in the community, and tracking measures were by telephone only. Language barriers, disconnected phone numbers, and a reluctance to share information with school staff were the primary issues documented on Community Support Workers’ Hearing Referral Tracking Sheets.

In any event, the four years of vision and hearing screening and follow-up initiatives in over 100 MSIC schools have, not only facilitated the identification of previously unsuspected sensory impairments, but also equipped thousands of inner city children with the optometric and auditory supports they need to better flourish in school. While multi-year longitudinal research will determine the long-term impact of this school-based screening program on the educational, health, and social outcomes of inner city students, for now it is certain that this integrated initiative has at least:

- delivered a key service to a vulnerable population in a trusted part of their local community - i.e., their neighbourhood school; and
- provided a working model of integrated service delivery, as it targets health dollars to address both educational and health outcomes in a holistic framework.

GOVERNMENT FUNDING AND SUPPORT IS NEEDED

So far this important school-based health initiative has relied solely on private donations. While it has helped correct previously unrecognized, but remediable, vision and hearing problems of thousands of students in inner city schools, the board also realizes that this essential health effort would not be sustainable in the long run simply through fundraising and private donations. Previous attempts (from 1970 on) to rely on philanthropic support to address health inequities in our inner city schools proved unsustainable over time, as stable funding was hard to secure over the long term. Although these invaluable programs did provide services such as on-site vision screening and free glasses, without the support of good public policy and continuous funding, they were inevitably discontinued.

Therefore, the TDSB is requesting inter-ministerial funding to supplement the board's existing resources in order to ensure such important vision and hearing screening initiatives can be sustained to address the essential health needs of students in our high needs communities. The following outlines the specific funding requests for a 3-Year Vision and Hearing Screening Clinics Program that will serve the growing number of MSIC schools across the city.

Year 1 (2011-12): To serve 128 schools, approximately 60,000 students

- \$20,000 from the Ministry of Health to provide optometrist examinations for non-OHIP covered children and youth
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- \$200,000 permanent inter-ministerial funding to the MSIC Program to ensure children are screened, referred if necessary, given appropriate high quality medical care, and provided with free glasses and/or other necessary aids, and, further to continue to develop the model of integrated service delivery within the context of under-served communities across Toronto.

With the working model already established in the TDSB’s MSIC, along with stable funding and support from the provincial government, we believe that not only can this integrated health and educational initiative benefit our inner city children, it can also:

- meet several key targets of Ontario government’s *Poverty Reduction Strategy*;
- maximize public dollars for service delivery that is both effective and preventative - ‘Public money for public good’;
- easily be expanded to include other important health care and infection prevention measures (i.e., immunizations, TB tests, newborn care etc.); and
- be replicated province-wide, or wherever there are communities struggling with poverty (i.e., urban centres or rural districts).

REFERENCES

- Bamford, J., Fortnum, H., Bristow, K., Smith, J., Vamvakas, G., Davies, L., ... Hind, S. (2007, August). Current practice, accuracy, effectiveness and cost-effectiveness of the school entry hearing screen. *Health Technology Assessment*, 11(32), 1-168.
- Canadian Association of Optometrists. (1998). Vision and Learning. *FYI Newsletter*, 60(2). Retrieved from: http://www.opto.ca/media/docs/en/fyi-archive/1998/Vol%2060_2.pdf
- Canadian Paediatric Society, Community Paediatrics Committee. (2009). Vision screening in infants, children and youth. *Paediatrics & Child Health*, 14(4), 246-248.
- Cluver, L. P., & Hodges, A. (1990, November). Comprehensive Public School Hearing Health Plan: Screening, Follow-Up, Teacher Inservice.
- Eiserman, W. D., Shisler, L., Foust, T., Buhrmann, J., Winston, R., & White, K. (2008). Updating Hearing Screening Practices in Early Childhood Settings. *Infants & Young Children*, 21(3), 186-193. doi: 10.1097/01.IYC.0000324548.54693.fc
- Ethan, D., & Basch, C. E. (2008, August). Promoting healthy vision in students: progress and challenges in policy, programs, and research. *Journal of School Health*, 78(8), 411-416. doi: 10.1111/j.1746-1561.2008.00323.x
- Ethan, D., Basch, C. E., Platt, R., Bogen, E., & Zybert, P. (2010, July). Implementing and evaluating a school-based program to improve childhood vision. *Journal of School Health*, 80(7), 340-345. doi: 10.1111/j.1746-1561.2010.00511.x
- Guttman, A. (2001, October). Child poverty, health and health care use in Canada. *Paediatrics & Child Health*, 6(8), 509-513.
- Kimel, L. (2006, June). Lack of follow-up exams after failed school vision screenings: An investigation of contributing factors. *The Journal of School Nursing*, 22(3), 156-162.
- Kulp, M. T., & Schmidt, P. P. (1996, April). Visual predictors of reading performance in kindergarten and first grade children. *Optometry & Vision Science*, 73(4), 255-262.

- Logan, N. S., & Gilmartin, B. (2004, November). School vision screening, ages 5-16 years: the evidence-base for content, provision and efficacy. *Ophthalmic & Physiological Optics*, 24(6), 481-492. doi: 10.1111/j.1475-1313.2004.00247.x
- Orfield, A., Basa, F., & Yun, J. (2001). Vision problems of children in poverty in an urban school clinic: Their epidemic numbers, impact on learning, and approaches to remediation. *Journal of Optometric Vision Development*, 32(3), 114-141.
- O'Reilly, J. & Yau, M. (2009, February). *2008 Parent Census, Kindergarten-Grade 6: System Overview and Detailed Findings*. Research and Information Services, Toronto District School Board.
- Ross, D. S., Holstrum, W. J., Gaffney, M., Green, D., Oyler, R. F., & Gravel, J. S. (2008, March). Hearing screening and diagnostic evaluation of children with unilateral and mild bilateral hearing loss. *Trends in Amplification*, 12(1), 27-34. doi: 10.1177/1084713807306241
- Spowart, K. M., Tappin, D., & Kerr, C. (1997, March). A review of school vision screening in Glasgow. *Health Bulletin*, 55(2), 118-125.
- Toronto Foundation for Student Success (2010). *2009-2010 Report – Gift of Sight and Sound Program*. Toronto District School Board.
- Wang, C., Bovaird, S., Ford-Jones, E., Bender, R., Parsonage, C., Yau, M., & Ferguson, B. (2011, May). Vision and hearing screening in school settings: Reducing barriers to children's achievement. *Paediatrics & Child Health*, 16(5), 271-272.
- Yawn, B. P., Lydick, E. G., Epstein, R., & Jacobsen, S. J. (1996, May). Is school vision screening effective? *Journal of School Health*, 66(5), 171-175.
- Yawn, B. P., Kurland, M., Butterfield, L., & Johnson, B. (1998, Oct). Barriers to seeking care following school vision screening in Rochester, Minnesota. *Journal of School Health*, 68(8), 319-24.

