

## EXECUTIVE SUMMARY

The future of our society is dependent on the health, wellbeing and educational achievement of the young people of today. It is therefore important that society encourages and enables young people to be healthy, happy, well educated and productively employed. The study of the effects of early economic inactivity on young people has identified a link between early inactivity with a high probability of inactivity at a later stage (Maloney, 2004). Maloney initially defined economic inactivity as "...occurring when an individual is not enrolled in education or training, and not working in the labour market." Consequences of this economic inactivity or non-participation are negative both for the young person and wider society (Flemming, Kainuku-Walsh, Denny, Watson 2004).

In his address to the inaugural Council Meeting on 27<sup>th</sup> October 2004, Mayor Garry Moore said. " I'd like to give a guarantee to our kids that in this city they will get to certain levels of literacy and numeracy. If you can read and count then you've got a very good start in life. This, however, cannot be undertaken by our schools on their own."

The LANE Project (Literacy and Numeracy Empowerment) was started in 2005 with funding from the Wayne Francis Charitable Trust. The project was set up to scope the problem of youth literacy and numeracy competency, and investigate strategies to enable the city guarantee to be fulfilled. It would start with no preconceived parameters and encompass as many potential types of youth as possible; from reluctant learners to truants to the more disadvantaged categories.

A literature search in 2005 suggested that medical barriers to learning could be a factor to lower achievement in education. Schools are unable to influence many barriers to learning but early medical interventions can have a profound influence on students' life chances. In particular children with problematic vision have difficulty performing reading tasks which are basic to achieving curriculum outcomes (Douglas et al, 2002). Also Denny, Clark and Watson (2004) have pointed out that students who are failing in education also have exceptionally high health needs and research suggests that the earlier students receive appropriate health interventions the greater the effect on the students' educational opportunities. As a consequence of this the LANE project conducted a comprehensive Health Pride Expo using 450 Year 9 and year 10 students at Linwood College in 2006.

This study of Linwood College students is based on a rationale that ill health may result in lower engagement in educational learning and aims to quantify the different rates of problems identified.

A number of separate but allied areas were studied in this project.

- Student's demographic data was collated to establish where Linwood College fitted in the Christchurch and national demographics and to assess if there were other compatible groups that could be used for comparisons.
- A specialist medical team from the Collaborative for Research and Training in Youth Health and Development was contracted to assess students' vision, hearing, oral health

and dental health. Students who needed further treatment to remedy any problems found were given access to free treatment.

- The incidence of Irlen Syndrome was investigated along with its impact on the student's ability to read.
- Medical measurements were taken by nurses for blood pressure and Body Mass Index (BMI).
- An international fitness standard was used to assess the overall fitness of the students.
- Students were assessed academically for literacy and numeracy using a nationally recognised asTTle programme and with the Burt and Probe tests for reading.
- Students who were in need of remedial reading were put on a phonics programme Toe by Toe.
- The pastoral records of students were examined to measure the behaviour modification effect of all of this intervention.
- The academic performance of students was again assessed in 2007 to determine the impact of this 2006 intervention.

Each of these is covered in detail in separate chapters in the body of the full report.

### **Health Assessment**

This report provides the results of research undertaken by the Collaborative for Research and Training in Youth Health and Development (Collaborative) for the LANE Project. Previous research undertaken in New Zealand has suggested that the majority of young people report their health as being good but the New Zealand morbidity and mortality data show that young New Zealanders have higher rates of suicide, teenage pregnancy, and abortion and suffer more injuries than their counterparts in other OECD countries (CDHB Youth Health Position Paper in draft). Assessment of the students' eyes, ears and teeth are the subject of this particular research study. The primary goal of this research is to identify the status of Linwood College Year 9 and 10 students' physical health and identify possible links between their health and their ability to engage positively in their own education and learning.

Results:

402 students tested and only 118 did not have a referral i.e. 29%

176 students were referred for eyes, 147 for teeth, 47 for ears

284 students were referred for at least one health problem i.e. 71% of all students tested were referred

Of the referrals, 85 needed eye treatment, 147 needed dental treatment and 12 needed ear treatment.

72% of all referrals resulted in some form of treatment

51% of all students tested received some form of treatment

9% of all students received two or more different treatments

2 students required all three treatments, but eye exercises, not glasses.

### **Health Recommendations**

- The data suggests there is a significant number of students whose ability to engage fully in their secondary school education is being compromised by treatable health conditions. Many of the conditions uncovered had provided educational challenges to the students and anecdotal comments made by the students suggest that treatment of the impairments

have made dramatic differences to their engagement with education. The research suggests that timely detection and treatment of these conditions would enable young people to engage more fully with education at an earlier age. Therefore it is recommended that all children have regular health assessments and that the results of the assessments and treatments provided are entered into a national database. This would allow each child to be followed up and ensure that treatment regimes were maintained.

- To enable the setting up of a national data base there needs to be a comprehensive investigation into New Zealand-wide systems to address the issues of health related barriers to education.
- The results of a comprehensive investigation would provide the impetus for government ministries, local bodies, and district health boards to collaborate in the development of a health assessment policy and national database.
- The research highlighted the issue of managing student referrals. Further research needs to be undertaken to identify the barriers to students attending follow up appointments when they have been set up.
- The research found that a number of students needed eye exercises to enable them to see properly and discussion with the optometrist suggested that most students would benefit from regular exercise of all the muscles of their eyes. Therefore it is recommended that attention be given to the development of a series of posters and pamphlets marketing the series of eye exercises prescribed to many of the students at Linwood College. It may be helpful if an eye exercise campaign was developed and promoted nationally in tandem with the healthy exercise campaign already underway.
- The primary health providers investigate the reasons behind the poor uptake in free dental care up to the age of 18.

### **Health Measurements**

This report details the methods used in the Health measurements of Year 9 and Year 10 Linwood College students using the internationally recognised BMI charts, the waist, fat index and blood pressure measurements.

It examines the 2006 Ministry of Health paper “An Analysis of the Usefulness and Feasibility of a Population Indicator of Childhood Obesity” and utilises its recommendations and validates the study undertaken in this project.

It details the efforts taken to ensure consistency and accuracy of these measurements and the results obtained.

The Health measurement is one facet of this larger study and produced some surprising results when compared to the results quoted in An Analysis of the Usefulness and Feasibility of a Population Indicator of Childhood Obesity, Ministry of Health, 2006. Wellington. Some 30% of New Zealand students are reported to be obese.

Obesity is related to exercise and aerobic fitness levels.

This Linwood College study places 17% of its students in the obese category and 13% of students in the overweight category.

### **Aerobic Fitness Measurements**

This report details the method of measuring the aerobic fitness of Year 9 and Year 10 Linwood College students using the internationally standardized Queens College step test.

The aerobic fitness test produced some surprising results when compared to the results quoted in *An Analysis of the Usefulness and Feasibility of a Population Indicator of Childhood Obesity*, Ministry of Health, 2006. Wellington. Some 30% of New Zealand students are reported to be obese. Obesity is related to exercise and aerobic fitness levels.

This Linwood College study places 72% of the student population in the Superior or Excellent fitness category and 87% in the Superior, Excellent or Good fitness categories.

At first reading this could suggest that Linwood College students are much fitter than the larger New Zealand student population.

- What the combined results of the Health and Aerobic Fitness measurements probably show is that the BMI charts used in the obesity study which are for European and North American students are not equipped to take cognisance of the Maori and Pacifica components of our population and that some research needs to be done on standardising some charts specifically for New Zealand children.
- These also raise some other issues for SPARC, the Ministry of Education, the Ministry of Health and others charged with our children's health and wellbeing. Perhaps the children are not as unfit or obese as the official message has portrayed and some research needs to be done elsewhere to either confirm the picture portrayed at Linwood or to confirm that Linwood students are indeed less obese and /or fitter than those in the rest of New Zealand.
- The study recommends that the Health authorities need to take notice of the conflict detailed in this study in using the Cole or CDC BMI charts and that there needs to be a comprehensive study of New Zealand children that recognises our ethnic diversity and that this is linked to aerobic fitness rather than arbitrary percentage population levels. This is important for clinicians to make effective use of such information.

### **Literacy Project – Toe by Toe**

Reading inquiries and research all over the world have concluded that systematically teaching phonics as well as whole word identification and how to use contextual cues is the most reliable way of teaching reading so that up to one third of children are not left behind.

Although Reading Recovery is designed to bring reading-delayed 6 year-olds up to their peers, at Linwood College around 30% are still behind by the time they start high school. Reading Recovery and the current early reading teaching methods do not seem to be working for a large number of students.

Toe by Toe is a synthetic phonics programme that uses repetition so that a student can learn the alphabetic sounds in English to allow easy decoding. Students at Linwood College, completing Toe by Toe in 2006, improved their reading ages by an average of 2.5 years

One of the students, sums up his progress. "Now I can read better it will help me get a job. Toe by Toe makes me think what the word is and I sound it out. If I had had the programme in Year 9, I might have been in a higher class because I would have been able to read. I used to guess words, now I can work them out."

- Ideally intervention would occur in the early primary school years. This study shows that later intervention (Year 9 and Year 10) can make a significant difference to the academic achievement of many of the students who receive Toe by Toe assistance.

### **Behaviour Modification**

Research on the relationship between educational difficulties and antisocial behaviour has had a long history. Many studies have found that children with educational difficulties are more antisocial, but the field has yet to reach a consensus about the precise cause of this relationship. Trzesniewski (2006) reports that an authoritative review of 17 longitudinal studies concluded that the relationship between educational underachievement and antisocial behaviour is robust, but also lamented that the cause of the relationship remains equivocal (Hinshaw, 1992) and more recent reviews agree (Dionne, 2005; Mandel, 1997). Understanding why young people's educational difficulties go hand in hand with their antisocial behaviour has important implications for interventions.

Prior to the students going on the Toe by Toe programme they were more disruptive than the average Year 9 student. However when they were on the Toe by Toe programme the level of disruptive behaviour reduced from the Year 9 level. In comparison, the average Year 9 student (not on the Toe by Toe programme) appears to become more disruptive as they move from Year 9 to Year 10.

- This study reports the positive effects of a reading programme intervention (Toe by Toe) that reduced the level of disruptive classroom behaviour.

### **Academic Performance**

The Health intervention process detailed how students were identified for three health regimes that could have an impact on barriers to learning. The process was carried out and students identified for eye, hearing and dental problems and relevant interventions were carried out by Health professionals. The question then arose, "Was it worth it academically?"

A number of measuring instruments were investigated and it was decided by the research team at Linwood College to use three internationally recognised measuring tools that the school was currently already using and had some experience with. The BURT Reading test for word recognition, the asTTle Reading and the asTTle Mathematics tests.

In 2006 all year 9 and year 10 students were given the Burt test. This was to form the basis of the benchmark for entry into the Toe by Toe remedial reading programme also run as part of this research project. Those who received glasses and control groups were retested in 2007 to gather the data for this evaluation. asTTle Reading and asTTle Mathematics tests were given to all new entrants, so Linwood had a ready supply of starting data. The database was constructed and the separate groups identified. A control group was randomly chosen by the computer to match within one or two points the students in the Intervention group.

- The results clearly show that each of the three medical interventions had a positive impact on student academic performance with the most significant impact being the acquisition of glasses in Year 10.

- The gains made by Intervention students compared to the Control group and the Cohort exceeded all predictions from Asttle data and they overcame the plateau effect evident in the National data for year 10 students.

### **Final Comment**

The LANE Project has as its focus the improvement of literacy and numeracy achievement. The 2006 Linwood College pilot study focussed specifically on health barriers to learning and the improvements that might be gained in literacy and numeracy by appropriate health interventions. This is a comprehensive report that gives a wide-ranging overview of the academic and medical snapshot of Year 9 and Year 10 students at Linwood College in 2006 and indicates:

- 1 Students on entry to Linwood College have significant health issues (eyes and teeth).
- 2 Interventions at Year 9 and Year 10, especially the provision of glasses at Year 10 improved the performance in literacy and numeracy.

These medical problems identified potential barriers to learning and suggest that students may have been prevented from making the expected academic progress in previous years. There is a need to ensure that children in early primary school are assessed and receive the appropriate intervention(s) to ensure they can make the appropriate gains in literacy and numeracy.

It is likely that there will be some change in a child's health status as they progress through school and therefore a further health assessment and intervention to check on this is required in early adolescence.

Two major recommendations emerge from the study:

### **RECOMMENDATION**

- **That there be systemic change in Primary Health care to ensure that appropriate health assessments and interventions are implemented at appropriate ages to identify and rectify health barriers to learning.**

The transient nature of the Linwood College student population as evidenced by this study identifies a need for some form of effective national tracking system for the recording of health assessments and interventions to ensure that all students receive follow-up assessments and treatment.

### **RECOMMENDATION**

- **That there be cross-agency cooperation in the establishment and maintenance of a database that records, amongst other things, student health assessment and interventions to address health barriers to learning. This data needs to be accessed by schools and agencies involved with each student.**