

### Outline of the issue

There is mounting evidence and public concern in Australia about increased prevalence of childhood obesity. Reduced physical activity (PA) is emerging as a major cause. Despite children spending a large part of their week in school, there is little data available on their PA levels during the school day in Australia. Studies of Australian school children have found poor mastery of Fundamental Movement Skills (FMS), especially among girls.

### Target group

Nine intervention and nine control schools were selected from a pool that had expressed interest. Schools were stratified by size and Department of Education and Training (DET) district before random allocation to the two groups. The sample covered the Northern Rivers area from Grafton in the south to Tweed Heads in the north and as Far West as Casino. The area is predominantly rural. Interventions focussing on Physical Education (PE) lessons and Fundamental Movement Skills targeted Year Three and Year Four children while the playground component targeted the whole school.

### An overview of the project including project aims and objectives

#### Partners involved

'Move It, Groove It' (MIGI) was a collaborative effort of the Northern Rivers Area Health Service (NRAHS) Health Promotion Unit (HPU), Southern Cross University (SCU), and three NSW districts of the Department of Education and Training (DET).

#### Project objectives

As a research and demonstration project MIGI's broad goal was to develop a generalisable model to enhance knowledge, understanding and practices in order to increase physical activity levels in primary school children. It sought to provide new evidence, instruments and intervention methods in the field of child physical activity. In particular, MIGI aimed to increase physical activity levels of children both during PE lessons and in the

playground during break times, and also to improve child mastery of FMSs.

#### Specific objectives were to:

- ▶ develop and validate an instrument to assess children's physical activity levels in school playgrounds
- ▶ establish a baseline of children's overall moderate to vigorous physical activity levels in the school playground
- ▶ increase children's physical activity levels in the school playground during lunch and recess by 10%
- ▶ increase the participation rate of girls in school playground activities by 10%
- ▶ increase by 10% the number of school students who achieve mastery or near mastery of motor skills
- ▶ establish a baseline of children's physical activity levels in PE lessons
- ▶ increase children's physical activity level by 10% in PE classes
- ▶ identify factors that will encourage the sustainable uptake of the intervention.

### Project strategies/implementation

#### There were five strategies:

1. A 'buddy program' in which pre-service teachers, trained to improve fundamental movement skills and physical activity levels in schools, were paired with teachers in each of the intervention schools. This enabled two way exchange, with pre-service teachers providing new knowledge, and classroom teachers providing teaching skills and experience.
2. Professional development for classroom teachers in areas of their choice relevant to physical activity promotion in schools.
3. Establishment of school project teams to address physical activity issues within the school.
4. A website with information, lesson plans and resources related to physical activity in schools.
5. A small amount of funding for equipment purchase.

## Methodology

MIGI was evaluated quantitatively by testing child FMS mastery and by observing the physical activity of children in physical education classes and in the playground both prior to and after the intervention. In FMS testing children were asked to perform a skill while observers rated presence or absence of skill components. Skills tested were: balance, throw, catch, sprint, hop, kick, side gallop and jump. Each child's performance of each FMS was then classified as 'mastery' (they mastered all components), 'near mastery' (all but one) or 'poor'.

For physical activity testing in PE lessons the validated System for Observing Fitness Instruction Time (SOFIT) was used. This entailed selecting 4 children in a lesson, sequentially observing them for 12 periods of 20 seconds each and allocating a score for their level of physical activity (1 to 5) and lesson context (management /instruction, skill practice, game, fitness or other) at the moment each time period ended.

For playground observation, the Child Activity Scanning Tool (CAST) was developed to assess physical activity levels, equipment availability/use and teacher presence/behaviour during recess and lunch. It used a team of five observers to simultaneously scan a play area every 75 seconds until the break ended. Scans alternately focused on boys and girls. Each scan involved two visual sweeps. On the 1st, the observer counted the number of boys or girls engaged in an allocated physical activity SOFIT level. On their 2nd sweep, they counted an allocated equipment or teacher category. Equipment categories were: balls in the area, children playing ball, children playing with non-fixed equipment other than balls and children playing on fixed equipment. Teacher categories were: teachers present in area, teachers observing, teachers managing and teachers encouraging physical activity.

Temperature, humidity and 'wet' or 'dry' day were recorded each play break along with numbers of available equipment items such as ropes, frisbees, hoops, bats and fixed equipment.

Analysis was by multiple hierarchical logistic regression.

Figure 1. Percentage mastery of fundamental movement skills

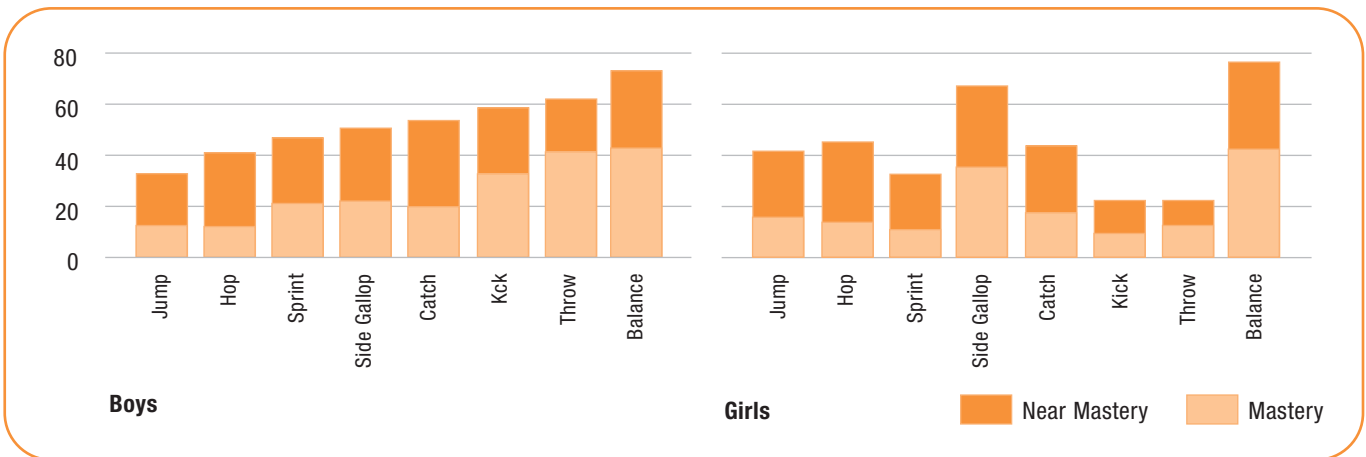
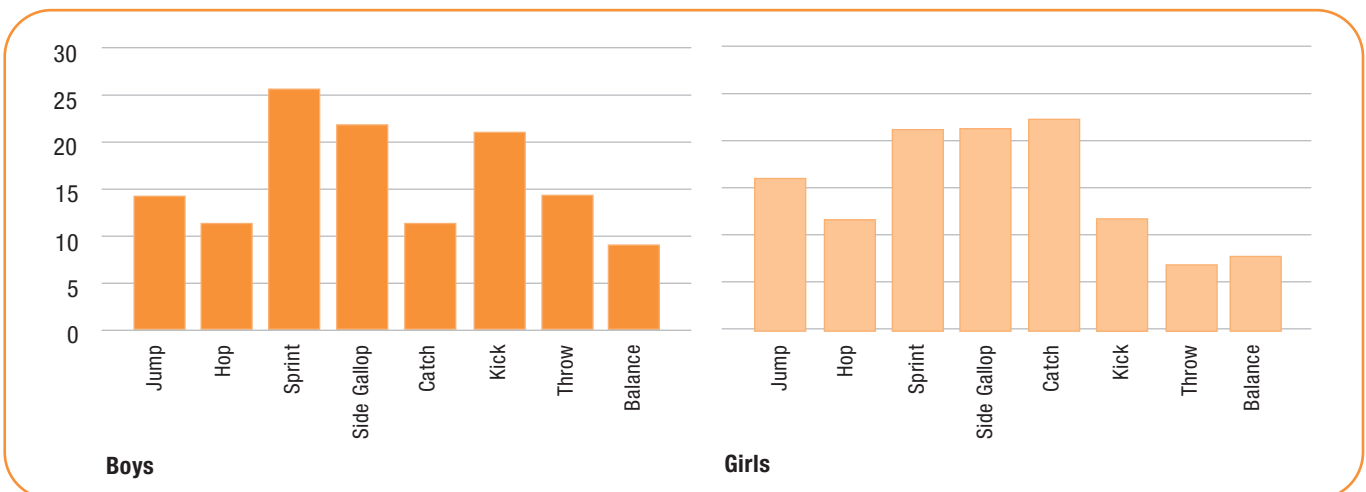


Figure 2. Percentage improvement in mastery and near mastery, intervention relative to control



### Results

#### *Strategies and process*

The combination of school project teams, a professional development program for teachers, a 'buddy system' and supporting website and funding for equipment proved a highly acceptable and sustainable intervention.

#### *Skill development*

MIGI exceeded the objective of increasing FMS mastery by 10%, with mastery levels increasing by a relative 11% to 60% on baseline levels depending on type of skills. (Figure 1. baseline levels, Figure 2. 12 month changes – intervention/control.)

#### *Physical activity levels in physical education lessons*

At baseline, mean-adjusted percentage moderate to vigorous physical activity was 34.7% (CI 29.8 to 39.9). MIGI achieved a 4.5% increase in moderate to vigorous physical activity during PE lessons, with a 3.03% increase in vigorous physical activity.

#### *Physical activity levels in the playground*

There was no evidence of a positive intervention effect on child physical activity in the playground or the participation rate of girls in the playground. Both the PE and playground outcomes probably reflect the brevity of the MIGI intervention in a complex inter-sectoral context rather than lack of responsiveness to change or inherent ineffectiveness of intervention strategies.

#### **Major contributions of MIGI**

The MIGI project has highlighted the dilemma between keeping children active in PE and furthering development of FMS. MIGI has also:

- ▶ developed a generalisable whole school approach to physical activity that is acceptable and sustainable
- ▶ validated a new playground instrument: CAST (Children Activity Scanning Tool)
- ▶ provided the first Australian benchmarks on physical activity in PE lessons and playground through direct observation
- ▶ collected additional rural Australian data on FMS mastery
- ▶ provided evidence that child FMS mastery can be improved substantially by a well planned one year intervention.

#### **Recommendations**

The following recommendations reflect specific findings from MIGI.

Concentrating on improving FMS mastery may be a better goal for schools than attempting to increase physical activity within PE lessons. In the long run, with the ultimate goal of improved adult health, mastery of FMS's may have a greater impact on children's ability, desire and motivation to participate in lifelong physical activity than an extra few minutes per week spent in physical activity as children.

#### *Fundamental movement skills*

- ▶ That mastery levels of primary aged children in performance of FMS be used to benchmark and track FMS mastery of all primary school children throughout their primary years.
- ▶ That all teachers who teach PE be trained to teach FMS mastery, that their reliability be regularly reassessed and that wherever possible, the same person who tests a child initially should do so at any subsequent follow-up.

#### *Physical education lessons*

- ▶ That PE lessons be scheduled in the morning as children were more active earlier in the day.
- ▶ That daily fitness lessons of 20 minutes be scheduled as this will achieve a greater change in terms of minutes per week in physical activity than improving the physical activity level within the lesson.

#### *Playground*

- ▶ That girls' engagement in physical activity be promoted as their physical activity levels were consistently lower in all break types and all school sizes. Interventions could include policy and environmental strategies (eg allocated playground areas) as well as strategies designed to address the school's culture in regard to participation in physical activity.
- ▶ That the numbers of balls in the playground be increased as this will increase activity levels.
- ▶ That recess breaks are made longer even if lunch breaks are shortened.

## Further research

Recommendations regarding further research are as follows.

### Fundamental movement skills

- ▶ That the minimum set of skills most likely to be linked with future uptake and maintenance of an active lifestyle be established.

### Physical education

- ▶ That researchers be aware of the resource intensiveness of observational instruments such as SOFIT in the school context.
- ▶ That researchers be aware that PE lessons are often cancelled or rescheduled due to other competing school priorities and weather conditions.

### Playground

- ▶ That CAST be used as a valid and reliable tool for regularly monitoring child physical activity and environmental context in primary school playgrounds and other recreational settings. The newly developed CAST proved highly sensitive and practical, albeit labour intensive.
- ▶ That development and validation of a 'cut-down' CAST instrument be supported to provide schools with an easily-implemented monitoring tool for teacher use.

Further research to address the following questions is recommended:

- ▶ How can collaboration be optimised to sustainably increase child physical activity?
- ▶ What are the reasons for differences in physical activity levels between recess and lunch breaks?
- ▶ What are the reasons for differences in physical activity levels between small and large schools?
- ▶ What components of each FMS should be targeted for best training outcomes?
- ▶ What are the best strategies for teaching FMS without compromising physical activity levels?
- ▶ Is the maximum physical activity achievable within a PE lesson a significant proportion of recommended levels?
- ▶ To what degree can we increase the number, duration and quality of PE lessons?

Further research in the form of longitudinal studies is needed. This could take the form of tracking a cohort of MIGI participants through their adolescent years and into adulthood. Other skills not tested in MIGI may prove important in the quest to increase physical activity for both boys and girls. Again, further research is indicated in order to determine the optimal set.

## Publications

Barnett L., Van Beurden E., Zask A., Brooks L., Dietrich U. (2002) How active are rural children in Australian physical education? *Journal of Science and Medicine in Sport*. 5 (3): 253-265.

Barnett L., Molyneux M., Zask A., Van Beurden E., Dietrich U. (2002) How to evaluate planning document in schools? An evaluation component of MIGI (Move It Groove It), a physical activity intervention. Australian and New Zealand. *Journal of Public Health*. 26 (4): 389.

Van Beurden E., Zask A., Barnett L. (2002) Fundamental Movement Skills – How do primary school children perform? The 'Move It Groove It' program in rural Australia. *Journal of Science and Medicine in Sport*. 5 (3): 244-252.

Van Beurden E., Barnett L., Zask A., Dietrich U., Brooks L., Beard J. Can we skill and activate children through primary school Physical Education lessons? 'Move It Groove It' a collaborative health promotion intervention. *Preventive Medicine*. In Press. 36 (4): 493-501.

Zask A., Van Beurden E., Barnett L., Brooks L.O., Dietrich U.C. (2001) Active School Playgrounds – Myth or Reality? Results of the 'Move It Groove It' Project. *Preventative Health Medicine*. 33 (5): 402-408.

A copy of the full report on this project can be downloaded from the NSW HealthWeb site on [www.health.nsw.gov.au](http://www.health.nsw.gov.au)