Levels of 'vigorous physical activity' among pupils

John Balding
HEC Schools Health Education Unit
University of Exeter

Health-related fitness programmes are concerned with promoting 'acceptable' levels of physical activity. Just what constitutes an acceptable level is not only difficult to define, but is also hard to measure. By using a questionnaire to investigate pupils' levels of activity, a better insight may be obtained. This article discusses some results of analysing pupils' school-based vigorous physical activity.

The health-related behaviour data amassed by the HEC Schools Health Education Unit now includes information on more than 50,000 school pupils between the ages of 11 and 18. Within the most recent of the data banks, which is currently being expanded at the rate of several hundred cases every week, we have information available on more than 13,000 pupils.

The sample used for this analysis consists of 13,395 young people (6,927 girls and 6,468 boys) between the ages of 11 and 16. This group is taken from 64 schools located in 30 Educational Authorities scattered throughout England, Wales, and Scotland. The catchment areas vary, with 12 schools being predominantly urban, 28 suburban, and the remaining 24 rural. This sample is not a controlled one, since the schools make the decision whether or not to use the Questionnaire service. However, they are recommended to use mixed-ability rather than streamed groups, so that a representative sample of the school's population is surveyed.

The Questionnaire examines a very wide variety of health-related behaviours in its 66 questions. One of these examines the extent to which games, sports, and active recreations play a part in these young people's lives. A sample of the check-list of activities is shown here (Fig. 1). They are divided into *Team activities, Individual activities,* and *Other sports,* which may take place either *In school* and *Out of school,* and be indulged in either *At least once a week* or *At least once a month.* Using this information, the 'physical activity' index may be obtained. There are separate indices for 'vigorous team', 'vigorous individual', and 'non-vigorous individual' activities.

Involvement in 'vigorous' activities

The other 'health and fitness' papers in this issue emphasise involvement in vigorous activity and the contribution schools can make to promoting it in young people's lives. Therefore, a summary of school-related involvement in *vigorous* activity is given here. This index of involvement is calculated by giving two points for every sport or recreation that took place at least once a week, and one point for any that happened at least once

a month. For example, in Fig. 1 the physical activity index calculated from the ticks would be as follows:

Basketball played at least once a week	*2*
Hockey played at least once a week	*2*
Badminton played at least once a month	*1*
Swimming at least once a week	*2*
TOTAL	*7*

However, the index of level of participation in vigorous activities may not be as discriminating as we might like. For example, a pupil who swims every day of the week will score only 2 points, the same as another who plays soccer only once or twice a week. In addition, different activities demand different energy levels; a young person weighing 50 kg will expend the following energy in kcal during 10 minutes of typical involvement in the following activities (1):

Basketball	**85**
Cycling at 15 km/hr	**50**
Hockey	**67**
Judo	**98**
Running at 14 km/hr	**121**
Soccer	**90**
Swimming (front crawl)	**62**
Table tennis	**34**

Body weight will also have an approximately proportional effect on energy expenditure.

Seeking the 'at risk' candidates

Further development of this method is being researched, taking account of the limitations we have observed. However, there are some interesting observations to make if the figures in Table 1 are studied. To create this table, the sum of all vigorous activities arising from organised PE and games periods has been calculated.

1. **The activity indices are remarkably similar for the boys and the girls in the sample. There appears, therefore, to be no bias towards either sex in the level of provision for involvement in organised physical activities.**
2. **The indices for Year 1 and Year 5 show a noticeably lower involvement than in the results for Years 2–4.**

Reflection on Point 2 suggest that at least part of the 'past year' for 1st-year pupils was their last year in primary school, and that the jump to secondary-school level of organised activity will not be fully represented until the 2nd-year results. Similarly, the lower '5th-year' figures really refer to decreased active participation in the 4th year. Does this suggested fall reflect the experience of experienced PE staff among our readers? Are 4th- and 5th-year pupils who lack any particular sporting gift, or who are disenchanted with organised games, more likely to be helped to find alternative pursuits outside the area of physical activity?

However this may be, those pupils appearing in the 'zero' column are clearly among Neil Armstrong's potential high-risk candidates. This is further strengthened by further information available from our data, which is that the level of

	Index of 'vigorous activity'										No. in sample	
	0		1 – 6		7 – 9		10 – 12		13+			
	Boys	*Girls*	*boys*	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*
Year 1 (11+)	5	4	34	37	20	16	18	20	23	23	814	775
Year 2 (12+)	2	3	19	25	18	20	19	19	42	33	644	712
Year 3 (13+)	3	3	20	21	14	15	18	19	45	42	1889	1827
Year 4 (14+)	5	3	22	22	14	14	17	18	42	43	2174	2332
Year 5 (15+)	7	6	35	32	17	18	16	17	25	27	947	1281

Table 1. The percentage of 6,468 boys and 6,927 girls scoring different levels of involvement in physical activity in school.

physical activity inside school tends to match activity outside – a not unexpected result! But where should a line of concern be drawn?

Space does not allow the development of this study, but even this short survey shows how the enquiry might be refined, both qualitatively and quantitatively. This could give a good basis for judging the suitability of courses in the light of, for example, the availability of sporting facilities in the community served by the school.

Reference

1. Bar-Or, O., *Pediatric sports medicine for the practitioner.* Springer Verlag, 1983.