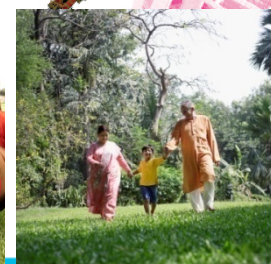


Effectiveness and cost-effectiveness of The Daily Mile on childhood weight outcomes and wellbeing

Peymane Adab
Professor of Public Health



Overview

- What is the Daily Mile
- Why evaluate
- The Birmingham Daily Mile evaluation
- Discussion of findings

THE DAILY MILE

Started in Scottish school to improve children's fitness

Also reported to improve:

- well being
- social interaction
- concentration levels
- reduce obesity

Every Day

Habit formation

15 mins
(~1 mile)

Children set
own pace

*Motivate through
autonomy*

Teachers choose
when/how



In school
uniform

*Capability/
competence*

Free?

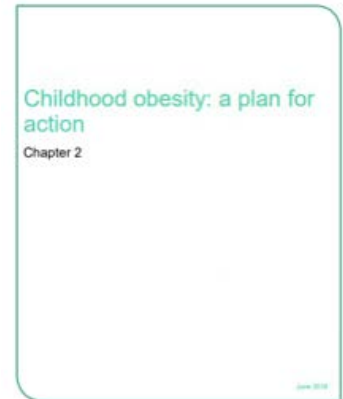
All pupils

*Inclusive/
social norms*

↓ Class time
75 mins/wk

UK CHILDHOOD OBESITY PLAN CHAPTER 2 (JUNE 2018)

HM Government



New measures announced to halve childhood obesity by 2030

New measures to halve the number of obese children by 2030 have been announced by Health and Social Care Secretary Jeremy Hunt.

Published 24 June 2018

From: [Department of Health and Social Care](#)



Schools included as having important role:

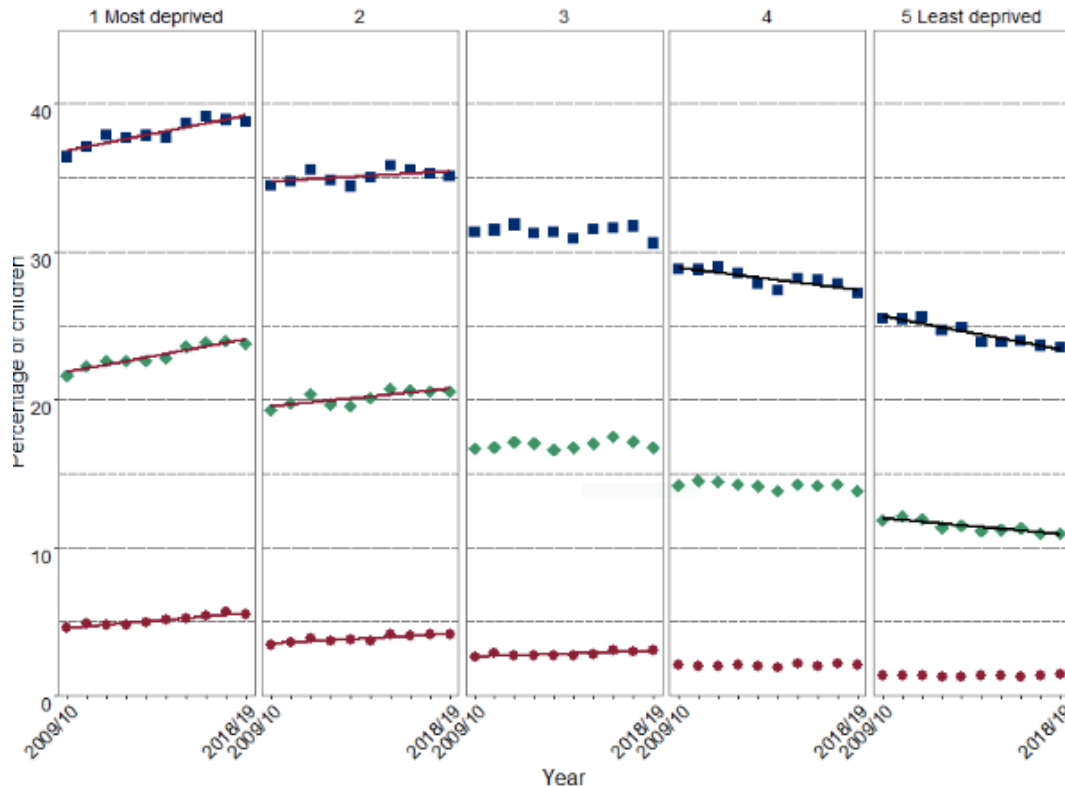
“...we will promote a national ambition for every primary school to adopt an active mile initiative, such as the Daily Mile.”

Childhood overweight/obesity in UK

Prevalence (National Child Measurement Surveillance Programme)

| Age (years) | Overweight/obese (%) | Obese (%) | V. Obese (%) |
|-------------------|----------------------|-----------|--------------|
| 4 – 5 (Reception) | 22.6 | 9.7 | 2.4 |
| 10 – 11 (Year 6) | 34.3 | 20.2 | 4.4 |

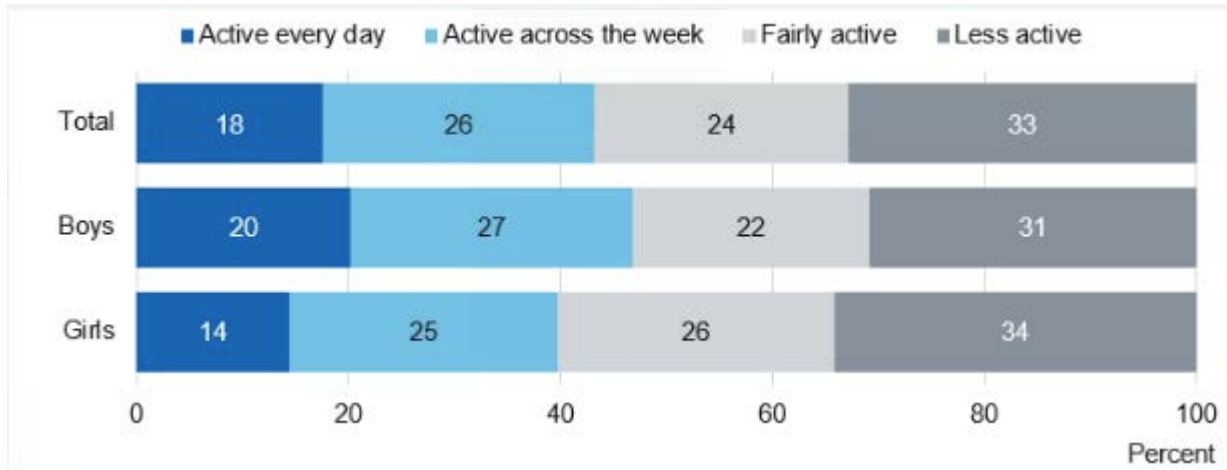
Prevalence of obesity doubles during primary school years



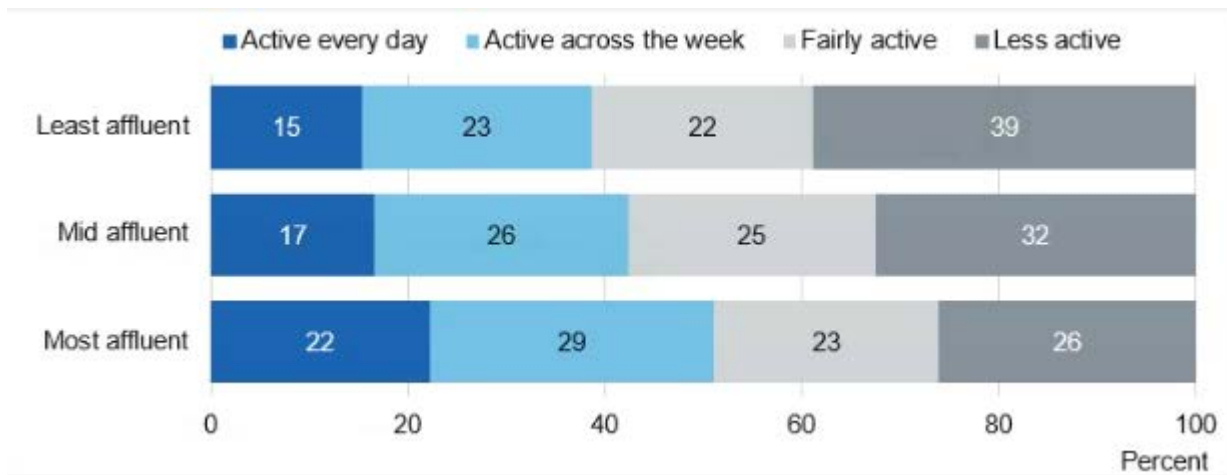
Prevalence of obesity, severe obesity and excess weight in Year 6 boys by deprivation quintile
NCMP 2020

Inequalities emerge in primary school years

Physical activity levels in UK children, 2018



Only 18% meet CMO guidelines (> 60 mins PA every day)



Prior evidence

Numerous trials and systematic reviews

- Love (Obes Rev, 2019)
 - 25 RCTs (17 in meta-analysis)
 - School based PA interventions /objective measures of PA
 - No evidence of effectiveness
- Brown (Cochrane Review, 2019)
 - Review of obesity prevention in children (6-12yrs)
 - 14 RCTs (16,410 participants): PA interventions vs control reduce BMI (MD $-0.10\text{kg}/\text{m}^2$)
 - 8 RCTs (6841 participants): PA interventions vs control has no effect on zBMI (MD -0.02)
- Brown (Obes Rev, 2008)
 - 38 trials, obesity prevention – narrative review
 - School PA intervention may be effective in girls



Birmingham Daily Mile Evaluation - cluster RCT (2017-18)

~108 Primary schools
South Birmingham

40 schools randomly selected
Pupils in Yr 3 & 5 (N=2280)

*Recruitment
Jan-March 2017*



Baseline measures:

- Height/weight/ body fat %
- HRQoL
- Teacher rated academic attainment
- Fitness

20 intervention
(N=1153)

20 control
(N=1127)

*Randomisation
April 2017*

20 schools (N=1107)

19 schools (N=1070)

*Follow-up 1
July 2017*

18 schools (N=994)

19 schools (N=970)

*Follow-up 2
Feb/March 2018*

Baseline Characteristics

| Characteristics | Intervention | Control |
|--|------------------|------------------|
| Female | 549 (47.6) | 534 (47.5) |
| Male | 604 (52.4) | 591 (52.5) |
| Mean (SD) age (years) | 8.8 (1.1) | 8.8 (1.0) |
| White British | 614 (53.3) | 559 (50.0) |
| South Asian | 186 (16.2) | 183 (16.3) |
| Black African Caribbean | 88 (7.6) | 103 (9.2) |
| Other/not specified | 264 (22.9) | 279 (24.8) |
| Deprivation quintile: 1 (most deprived) | 575 (49.9) | 621 (55.1) |
| 2 | 459 (39.8) | 169 (15.0) |
| 3 | 59 (5.1) | 222 (19.7) |
| 4 | 60 (5.2) | 58 (5.2) |
| 5 (least deprived) | 0 (0.0) | 57 (5.1) |
| Mean (SD) BMI z score | 0.37 (1.2) | 0.38 (1.2) |
| Quality of life and Wellbeing | | |
| CHU-9D utility score: Mean (SD) | 0.833 (0.2) | 0.838 (0.2) |
| Overall academic attainment score: Mean (SD) | 7.1 (3.2); n=626 | 7.3 (3.2); n=625 |

At randomisation (pre-intervention), characteristics well balanced

| BMIZ | | Mean difference (95% CI), P value |
|------------|--------------------------------------|-----------------------------------|
| Time point | No of participants | Intervention v control (adjusted) |
| 4 months | Intervention n= 911 Control n=732 | -0.056 (-0.103 to -0.009), 0.02 |
| 12 months | Intervention n= 850 Control n=820 | -0.033 (-0.084 to 0.017), 0.20 |
| | <i>Girls</i> | -0.094 (-0.158: -0.031); 0.01 |
| | <i>Boys</i> | 0.027 (-0.040: 0.093); 0.54 |



Merritts Brook @MerrittsBrook · Feb 2

Year 6 have been using maths in a variety of ways today. Firstly, they calculated the total steps each classmate did during Run a Mile using the pedometers. Following that, they then worked in teams to solve complex clues as part of a maths treasure hunt. #thinkbig #teamspirit



Hollywood Primary
@HollywoodPSUK

Follow

Our daily mile @S4EHES is really helping Hollywood children run further more comfortably at @WH_FunRun part 3



Tiverton Academy
@TivertonA

Follow

👉ElliotFndtn @ShirestoneAcad @S4EHES
👉BCCEducation @Anfieldexile Fun in the Sun
s Y2 #runamile #enjoy #healthy



Other findings

| Outcomes: | Adjusted Mean difference (95% CI) Intervention v control | | | |
|---------------------------|--|---------|-----------------------|---------|
| | 4 months | P value | 12 months | P value |
| Body fat % | | | | |
| CHU-9D utility score | -0.18 (-0.61 to 0.24) | 0.40 | -0.01 (-0.42 to 0.40) | 0.97 |
| MDI Wellbeing Index score | N/A | | 0.01 (-0.02 to 0.04) | 0.50 |
| | N/A | | 0.557 (-2.15 to 3.27) | 0.69 |

Large amount of missing values for fitness and academic outcomes (teacher measured)

Overall, no significant difference between groups for other outcomes.

In pre-specified subgroup analyses, effects were favourable for girls only

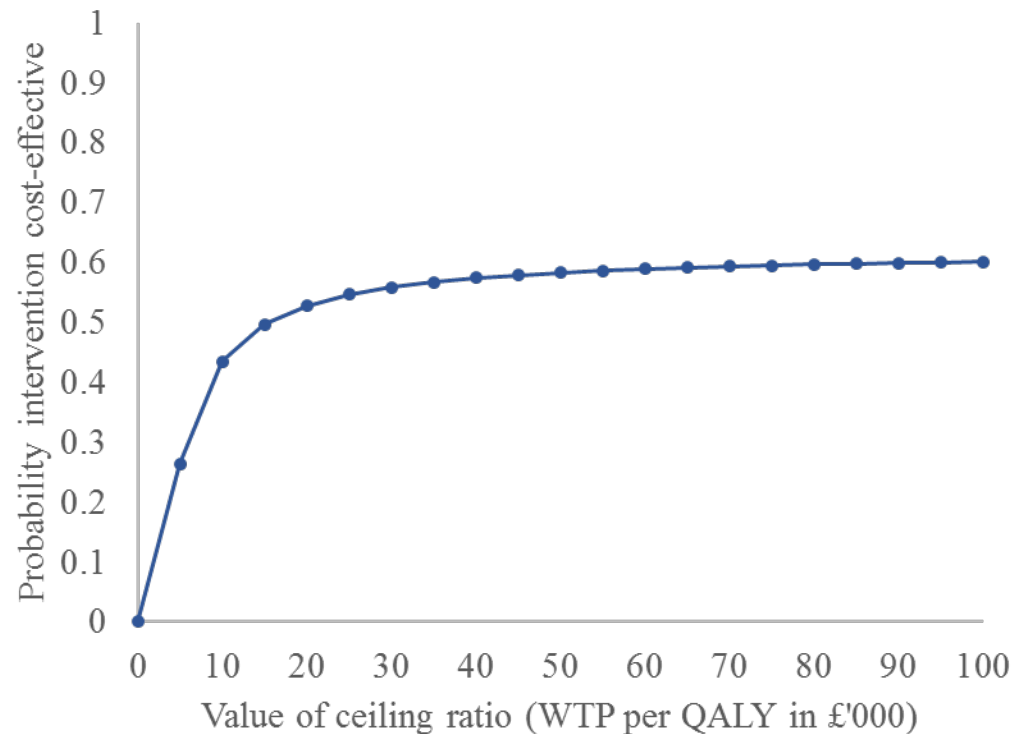
Cost-effectiveness

- Intervention costs ~£48.33 / child
- Overall there was a small gain in QALY (0.006 (95% CI: -0.005 to 0.018))
- ICER £7,455.21 per QALY gained (cost-effective using UK thresholds)

Cost-effectiveness

Using £20,000/ QALY:

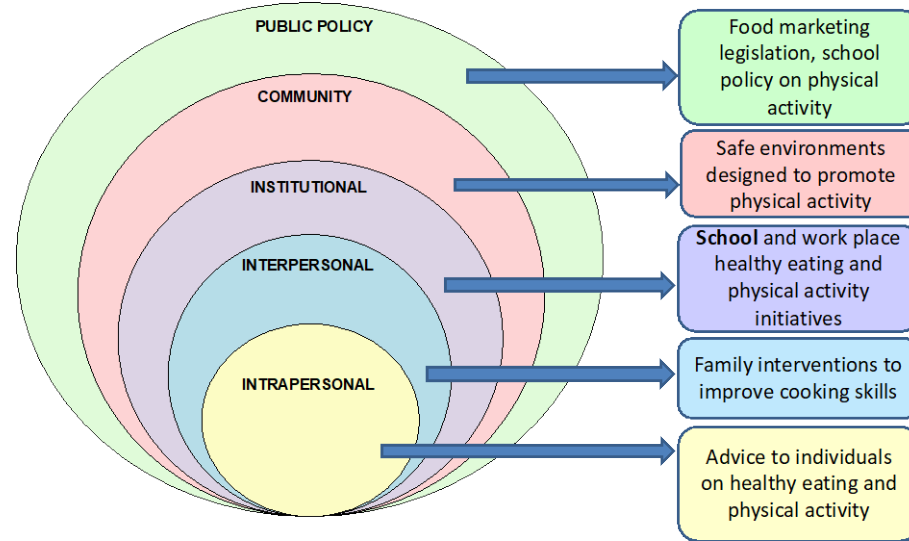
- 76% probability that Daily Mile is cost-effective
- Cost-effectiveness higher in girls (ICER £2,492 per QALY, 97% probability of cost-effectiveness)
- Low in boys: 12% chance of cost-effectiveness



Cost-effectiveness acceptability curve

Conclusions

- Daily Mile is a simple, whole school intervention, supported by the Government
- Some schools engage well and deliver this (others lack enthusiastic support)
- Enthusiasm is not always sustained
- Overall, the Daily Mile has a very small, non-significant effect on weight status at 12 months (compared to no intervention), and likely cost-effective.
- No evidence of harm on academic outcomes
- The effect is likely to be higher in girls (may be ineffective in boys)
- Schools are complex systems – interventions need to be adapted to local context; RCTs should consider process of implementation (not just components)
- Schools only part of the solution: complex problem needs prevention at multiple levels



Acknowledgments



Co-investigators:

UoB: Emma Frew, Katie Breheny, James Martin,
Emma Lancashire, Karla Hemming

Services for Education: Sandra Passmore

Funding: Birmingham City Council