An Economic Evaluation of the Holiday Activities and Food (HAF) programme, titled, 'Bring it on Brum', in Birmingham (April 2023).

Authors: Tobyn Eagles[1], Peter McMeekin[1], Andrew McCarthy[1], Paul Stretesky[2], & Margaret Defeyter[3]

Affiliations:

[1.] Department of Health Economics and Applied Statistics, Faculty of Nursing, Midwifery and Health

[2]. Department of Social Sciences, Faculty of Arts, Design and Social Sciences

[3.] Department of Social Work, Education and Community Wellbeing, Faculty of Health & Life Sciences

Introduction

The holiday activity and food (HAF) programme is funded by the Department for Education (DfE) and aims to address holiday hunger, physical inactivity, social isolation, childcare needs, learning loss and school readiness for the most vulnerable children and young people across all higher tier local authorities in England; with the largest HAF programme being delivered in Birmingham (Defeyter, *et al.* 2022). In Birmingham, this programme is spread across 243 providers who delivered 278 holiday clubs to 32,000 children from the most deprived neighbourhoods across Birmingham (Defeyter, *et al.* 2022). Children from the same deprived areas, not eligible for free-school meals were also invited to participate (further details about the Bring it on Brum evaluation are available online: https://www.northumbria.ac.uk/takeontomorrow/it-is-time/holiday-activity-and-food-programmes/)

Data collection showed the HAF programme had a positive impact on both parents and children involved. 92% of children enrolled in HAF attended more than 100 hours of scheduled sessions which increased their physical activity levels and provided enjoyment over the holiday period, with children reporting "holiday club was fun" (Defeyter, *et al.* 2022). Importantly, the extra hours of attendance showed a significant benefit to parents by addressing and solving the usual childcare issues faced by many families over school holiday periods. Children had access to food and different enriching activities whilst attending the clubs.

This report will seek to highlight both individual and cost benefits associated with the HAF programme in Birmingham.

Modelling

Estimating the long-term consequences of programmes like HAF poses methodological and practical challenges. Frameworks such as randomised control trials would involve randomly assigning children (or groups of children) to treatment and control groups and then following each child for as long as benefits might be expected to be seen.

We have chosen to estimate the benefits of HAF to offset the costs of provision using a Threshold model. The model will identify and value benefits and estimate the likelihood that, over the longer term these benefits exceed the costs of provision (the Threshold). We have opted to use evidence from social return on investments (SROI) to assess the benefits and costs associated with programmes like HAF.

An SROI approach monetises value using a common metric, which enables multiple inputs and outcomes across different social impacts to be valued (Davies, et al. 2019). It allows a calculation of a singular monetary ratio, which encapsulates both positive and negative outcomes, and allows a clear and easy to understand illustration of the return on investment (Fujiwara, 2014).

An SROI is a framework used for comprehension, measurement and valuation of net social impacts of an activity, organisation or intervention (Nicholls et al. 2012). SROI decision rules

are used to determine the feasibility of a social investment, and to assess the social, environmental, and economic returns on that investment.

Here are some commonly used SROI decision rules:

1. Minimum acceptable rate of return: This rule specifies the minimum rate of return that an investor would require for the investment to be considered viable. The minimum acceptable rate of return should be set in consultation with stakeholders and should consider factors such as risk and opportunity cost.
2. Net present value: This rule calculates the present value of the investment's future returns, minus the present value of its costs. If the net present value is positive, the investment is considered viable.
3. Benefit-cost ratio: This rule calculates the ratio of the investment's benefits to its costs. If the benefit-cost ratio is greater than one, the investment is considered viable.
4. Payback period: This rule calculates the time it takes for the investment to pay for itself through the returns it generates. If the payback period is within an acceptable timeframe, the investment is considered viable.
5. Social impact criteria: This rule evaluates the social impact of the investment against predetermined criteria, such as the Sustainable Development Goals or a set of social impact metrics. If the investment meets or exceeds the predetermined criteria, it is considered viable.

It is important to note that SROI decision rules should be tailored to the specific context and goals of the investment and should be reviewed and updated regularly to ensure they remain relevant and effective. In the case of HAF, the threshold analysis is based on the benefit-cost ratio of one or more of the programme's objectives or goals.

Obesity

The outbreak of Covid caused widespread disruption across the UK. This not only affected working adults but also school age children and young people. All aspects of day-to-day life were interrupted with uncertainty and long periods of inactivity and restriction on behaviours.

Studies indicate that children that experienced disruption to their education and social environment exhibit an increased susceptibility to following poor dietary habits, have poor mental health and wellbeing, as well as a reduction in physical activity levels (Bates et al., 2020; Defeyter et al., 2020; James et al., 2021; Van Lancker & Parolin, 2020). The National Audit Office (2020) stated that children in deprived areas are twice as likely to be obese than those in less deprived areas with the current gap continuing to widen. Additionally, children's activity levels can decrease up to 53% over holiday periods, leaving them vulnerable to tipping the balance in favour of energy intake and weight gain (Volmut, *et al.* 2021).

It is evident that school age children and young people from deprived areas face a number of factors that makes it difficult for them to live healthy lives (e.g. afford nutritious food);

and childhood obesity is one of the most serious global public health challenges of modern times with obese children almost 5 times more likely to be obese in adulthood (NHS Digital, 2022; Simmonds, *et al.* 2017).

The multifaceted causes of childhood obesity including behaviour, environmental and genetic factors (Karnick & Kanekar, 2012). Genetic causes however are rare, and the increasing prevalence of childhood obesity suggests that behavioural and environmental factors are the underlying factors behind the childhood obesity epidemic (RSPH, 2015; Ebbeling, *et al.* 2002). Childhood obesity has risen sharply in recent decades partly due to children living increasingly sedentary lifestyles where engagement in activities such as watching TV, playing video games, and time spent on smart phones has increased (WHO, 2015). Evidence shows that children from low-income households, and those with overweight or obesity gain more weight during the school holidays than the school year (Evans, *et al.* 2020).

There are considerable economic costs associated with obesity in the form of increased health care spending (Tremmel, *et al*. 2017). The economic costs do not stop with the diagnosis and treatment of obesity. Obesity associated illness like type 2 diabetes are a huge drain on the economy and the NHS. In addition, childhood obesity is linked as both a cause and consequence of several psychological disorders such as anxiety, poor self-esteem, poor body image and eating disorders (Gable, et al. 2009; National Obesity Observatory, 2011).

The NHS spent an estimated £6.1 billion on overweight and obese-related-illness in 2014/2015; a figure which is projected to exceed a yearly amount of £9.7 billion by 2050 (Gov.uk, 2022). The National Audit Office (2020) reported that £61.7million was spent on childhood obesity by local authorities in 2018/2019.

Interventions targeting children using programmed activity (as opposed to free-living activity) have resulted in clinically significant decreases in body fat and body mass index in obese children (LaMura & Maziekas, 2002) Similarly, reductions in body fat have been achieved through an intervention to reduce TV watching time (Robinson, 1999). Furthermore, school holiday clubs, which offer routine opportunities for physical activity and regular meal and snack times, have potential to mitigate excess weight gain (Evans, *et al.* 2020).

Social Return on Investment (SROI) Model for Childhood Obesity

In 2013/2014 a SROI calculated for children participating in extra sport and exercise as a policy tool for achieving wider societal outcomes and reducing risk showed a ratio of 1:1.91 meaning every £1 spent, returned an investment of £1.91 (Davies, et al. 2019).

This specific SROI included six health-related outcomes; two education-related outcomes; and three others related to subjective well-being, crime. The health outcomes included were, cardiovascular disease, stroke, type 2 diabetes, colon cancer, breast cancer and dementia, the majority of which can be attributable to obesity (Davies, et al. 2019).

To establish the estimate SROI for the HAF programme and its impact on obesity and consequential obesity related outcomes, we divided the funding amount of £8,029,880 by

the 32,000 children participating in Bring it on Brum during 2022. This gave a cost per child of £250.93.

Using the aforementioned SRIO, we multiplied £250.93 by 1.91 which gave the social investment return per child. This figure was £479.28 per child.

Given that there has been almost 10 years between 2013 and where we currently are, this could be a slightly different figure, however, considering that there has been a (4.6%) increase in obesity statistics for children aged 10-11 and a number of other diseases, it is assumable that this return will be higher when looking at children as a population.

It must also be noted that there are some differences in programmes between that of the SROI used and HAF in Birmingham, however, due to lacking research in this field and necessary data not currently available from the HAF programme, an assumption based on similarity is our current mode of estimation.

Antisocial behaviour and Crime

Patterson (1990) described antisocial behaviour to be a developmental trait that begins early in life and can continue into adolescence and adulthood. Literature reveals that during the first 5 years of life, family and personal characteristics are the critical predictors of child antisocial behaviours (Moffit, 1993; Patterson et al., 1992). Risk factors at home include, parents suffering from depression, family poverty and marital problems to name a few (Loeber, 1982). Patterson (1990) believes that environmental factors are the main cause of anti-social behaviours. Inadequate parental monitoring and a lack of parent involvement and supervision of children's activities seem to be important in the emergence and maintenance of antisocial behaviour in children from middle childhood through to adolescence (Gaik, et al. 2010; Patterson, 1990).

Other studies have evidenced an association between low family socioeconomic status and antisocial and aggressive behaviour (Aguilar et al., 2000 & Farrington, 2005). Patterson et al. (1992) reported that poor families undergo great stresses, and the parents are subject to negative experiences over which they lack control of.

Literature further emphasises the association between childhood antisocial behaviour and crime in later life. Studies show that youth engagement in delinquency and substance use before the age of 13 years increases the risk of long-duration, high-frequency involvement in crime and substance abuse (Blumstein et al., 1986; Bosick, *et al.* 2015; Ellickson, *et al.* 2003; Staff, *et al.* 2015; Thornberry and Krohn, 2003).

It is evident that children's home lives and social settings have a substantial impact on anti-social behaviours and crime later in life. Programmes which provide care, structure, and improve social skills, whilst keeping children 'off the streets' and out of potential pressured environments are likely to impact the possibility of enrolled children adopting antisocial behaviours.

Bring it on Brum (HAF) reported that 80% of parents perceived their children to be safer whilst attending the HAF programme compared to their local environment and 74% of

parents thought that enrolment in the programme kept children from participating in anti-social activity (Defeyter*, et al.* 2022).

SROI for Antisocial behaviour and crime

Ward and Thurston (2009) provide an SROI for keeping children off the streets and remotivating them using youth work at 1:3.7. Using the same equation as was used for obesity, this gives a value of £928.40 per child. Therefore, for every child deterred from participating in antisocial behaviour and associated crime, there is an approximate investment return of £928.40.

Another study evidenced its own SROI from a similar youth program and valued the crime prevented at £40.67 million. The crime prevention outcomes were valued by estimating the number of criminal incidents prevented among males in the 10–24 cohort taking part in sport (persons), multiplied by the average cost per incident of crime (value per person) (Brand and Price, 2000; Dubourg *et al*. 2005).

Clearly the costs associated with deterring antisocial behaviour are huge and provide a case to show holiday clubs and youth schemes to be worthwhile.

Parental stress

Parental stress was measured, in the evaluation conducted by the Healthy Living Lab, by use of a self-report survey sent to parents and caregivers. 1,339 parents took part in the survey and represented just over 100 clubs across Birmingham. A prolific sample of 1,109 parents whose children were not attending the HAF programme was also collected for comparison.

Household food security, measured by the USDA Household Food Secure Module (USDA Economic Research Services, 2020), improved significantly for households involved with HAF compared to those who were not. Notably, the household food security for children not in receipt of free-school meals also significantly improved, suggesting that HAF was successful in achieving its aim of preventing children going hungry (Defeyter, *et al.* 2022).

Childcare pressures were sufficiently decreased during the HAF programme and parents self-reported significantly less stress compared to parents whose children attended no holiday club.

A number of studies have reported that the provision of food at holiday clubs have the potential to alleviate family stresses caused by the financial burden associated with household food security (Defeyter et al., 2015a; Graham et al., 2016; Morgan, Melendez-Torres, et al. 2019; Shinwell & Defeyter, 2021; Stretesky, Defeyter, Long, Ritchie, et al., 2020).

We have already addressed the impact parental stress can have on children and the financial impact that can have on the economy, therefore this information further entrenches the theory that programmes like HAF are worthwhile and economically viable.

Wellbeing, Confidence and Impact on schooling

We have already established that children from lower socioeconomic backgrounds are highly susceptible to experiencing mental ill-health and do not have as much access to learning and development opportunities over holiday periods compared to their more affluent peers. This in turn can have a negative impact on schooling.

The disparity in access can be mainly attributed to a lack of financial means and a lack of appropriate child and youth provision in local neighbourhoods. The access limitations to and lack of participation in engaging and developmental activities means many children miss out on enriching educational opportunities (Blazer, 2011; Meyer et al., 2004; Stewart, Watson & Campbell, 2018; Summer Learning Association, 2009a). This can result in learning stagnation and learning loss alongside also suffering decline in their health and well-being (Graham et al., 2016; Slates et al., 2012; Shinwell & Defeyter, 2017).

Emerging research presents evidence which suggests that the long summer break has an accumulative effect on educational outcomes and is incredibly fundamental at contributing toward the attainment gap between richest and poorest children (Alexander et al., 2007, 2016; Slates et al., 2012; Von Drehle, 2010; Shinwell & Defeyter, 2017).

Holiday clubs like those within the HAF programme play an important role in reducing educational inequalities by enabling children from disadvantaged backgrounds access to these opportunities. In the recent evaluation of Bring it on Brum, 76% of parents thought the HAF programme supported children's wellbeing and confidence, with 63% of parents reporting the programmes positive influence on school readiness.

SROI for wellbeing, self-confidence and impact on schooling

A 2019 study measuring the SROI for a youth project and its associated club system in the UK found an SROI of 1:5.5 (Murphy, 2015). With similar outputs to the HAF program, it was identified as a good comparator to show an estimated investment return.

It operated a diverse range of delivery methods, over a prolonged period of time and including one-to-one work, group work, detached youth work and centre based sessions with a variety of youth work partners and locations, striking similarities to the HAF programme, however, this study was not restricted to just school holidays.

This ratio encompassed outcomes of increased self-confidence, physical wellbeing improvements, mental wellbeing improvements, pro-social behaviour, enhanced employment and career, reduced crime, teenage pregnancy prevention, reduced A&E admissions, drugs prevention and improve educational engagement. Many of these outcomes are similar to the HAF programme.

The SROI calculation when compared to costs associated with HAF would equate to £1380.11 per child enrolled in HAF. Given that the HAF program was costed at £250.93, the estimated return of investment on this alone is considerable.

Conclusion

It is evident that holiday clubs propose great benefits to individuals enrolled onto them. Using literature, we have identified a few with prior economic evaluation which are similar to the HAF programme so that we are able to estimate its value and benefits to individuals, society and the economy. There will undoubtedly be other benefits of the HAF programme which we have not been able to estimate in this report due to the previously mentioned lack of economic data specific to HAF, but nevertheless, literature alone indicates programmes like HAF certainly create opportunity for learning and development, decreased stress and financial burden for families and individuals, as well as have a profound lasting economic impact.

Notably, we can also assume that children from deprived areas who participate in these programmes are provided the tools and opportunity to 'level-up' in accordance with other children in society. Based on the existing research and the current paper, we argue that the HAF programme should continue to be funded and potentially expanded in terms of its reach, as an effective method to reduce multiple inequalities currently present in society. It would be of significant research interest for there to be the opportunity to establish the rate at which programmes like HAF reduce existing health, skills and educational inequalities at the national level.

SRIO Calculation

The SRIO calculation used throughout this report is as follows:

Total funding input: £8,029,880

Number of children participating in HAF in Birmingham: 32,000

We divided 8029880 by 32000 which gave us a cost per child of: £250.93

SROI's estimates were worked out by multiplying cost per child (£250.93) by the SROI given for each outcome, these were as follows:

Obesity: 1:1.91

- **£479.28** per child
- **£15,336,960** per 32,000 children

Antisocial behaviour and associated crime: 1:3.7

- **£928.40** per child
- **£29,708,800** per 32,000

Wellbeing, self-confidence and learning opportunities: 1:5.5

- **£1380.11** per child
- **£44,163,520** per 32,000

Total HAF spend per child: **£250.93**

Total estimated SROI per child: **£2787.79**

Total spent on HAF: **£8,029,880**

Total estimated SROI for HAF in Birmingham: **£89,209,280**

It must be recognised that although these figures are extremely promising, we can only estimate the potential SROI for HAF as we currently lack a robust evaluation framework specific for the HAF programme. Future benefits are appropriately discounted to reflect their present values.

Future recommendations for research would be to allot specific research funds and effort to establishing this so that we can accurately identify every benefit the national HAF programme offers to the individual right through to the economic value.

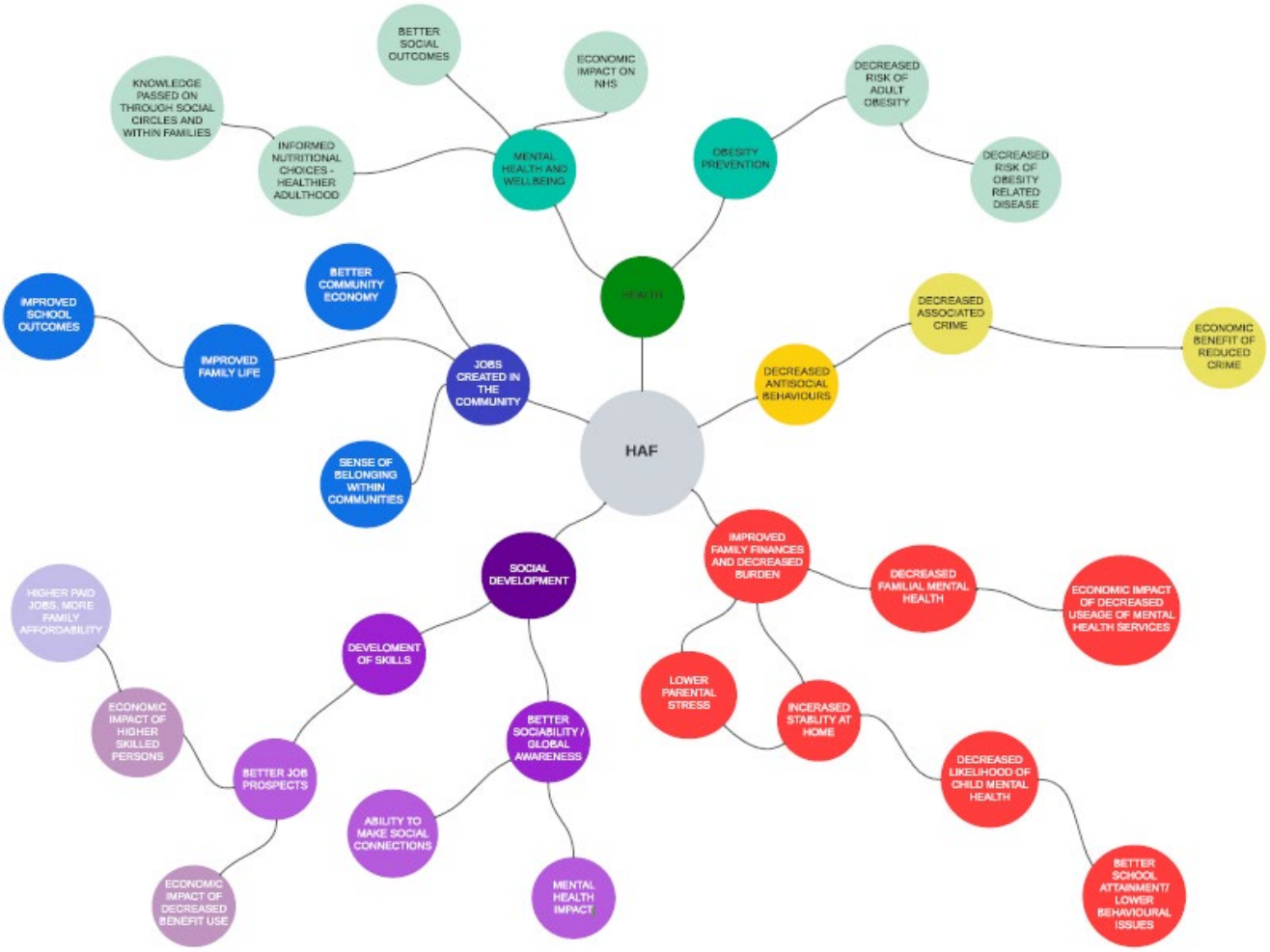

Figure.1. The above conceptual map was included to add a visual dynamic to the report. It shows some of the many multidimensional benefits the HAF programme has and will continue to achieve.

References:

1. Abarca-Gomez L, Abdeen Z, Hamid Z, Abu- Rmeileh NME, Acosta-Cazares B, Acuin C (2017) Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents and adults. *The Lancet*. 390:2627–42. 10.1016/S0140-6736(17)32129-3
2. Aguilar, B., Sroufe, L.A., & Carlson, E., (2000), "Distinguishing the early-onset/persistent and adolescent-onset antisocial behavior types: from birth to 16 years"' Development and Psychopathology, Vol. 12, pp. 109-32
3. Alexander KL, Entwisle DR and Olson LS (2007) Lasting consequences of the summer learning gap. American Sociological Review 72(2): 167–180.
4. Bates, B., Jones, K., Paige, P., Roberts, C., Steer, T., & Swan. G. (2020). *National Diet and Nutrition Survey. Roling programme Years 9 to 11 (2016/2017 to 2018/2019)*.
5. Blazer C (2011) Summer learning loss: Why its effect is strongest among low-income students and how it can be combated: Information capsule, volume 1011 (Research Services, Miami-Dade County Public Schools) Available at: https://eric.ed.gov/?id=ED536514 Accessed: 25/04/2023.
6. Blumstein Alfred, Cohen Jacqueline, Roth Jeffrey, Visher Christy. (1986) *Criminal Careers and "Career Criminals."* Washington, DC: National Academy Press
7. Boreham C, Riddoch C. (2003) Physical activity and health through the lifespan. In: McKenna J, Riddoch C, editors. Perspectives on Health and Exercise. Basingstoke: Palgrave Macmillan.
8. Bosick Stacey J, Bersani Bianca E, Farrington David P. (2015) Relating clusters of adolescent problems to adult criminal trajectories: A person-centered, prospective approach. *Journal of Developmental and Life-Course Criminology.* (1)1–20
9. Brand, S., and Price, R. (2000) Home Office Research Study 217: The economic and social costs of crime. Home Office. Available from: http://webarchive.nationalarchives.gov.uk/20110218135832/rds.homeoffice.gov.uk/rds/pd fs/hors217.pdf Accessed: 25/04/2023
10. Canaway, A., Frew, E., Lancashire, E., Pallan, M., Hemming, K., Adab, P., & WAVES Trial Investigators. (2019). Economic evaluation of a childhood obesity prevention programme for children: Results from the WAVES cluster randomised controlled trial conducted in schools. *PloS one*, *14*(7), e0219500.
11. Conger RD, Wallace LE, Sun Y. (2002) Economic pressure in African American families: a replication and extension of the family stress model. *Dev Psychol. 38:*179–93.
12. Davies, L. E., Taylor, P., Ramchandani, G., & Christy, E. (2019). Social return on investment (SROI) in sport: a model for measuring the value of participation in England. *International Journal of Sport Policy and Politics*, *11*(4), 585-605.
13. Defeyter, M. A., Graham, P. L., & Prince, K. (2015a). A Qualitative Evaluation of Holiday Breakfast Clubs in the UK: Views of Adult Attendees, Children, and Staff. *Frontiers in Public Health*, *3*(August). https://doi.org/10.3389/fpubh.2015.00199

14. Defeyter, M. A., Mann, E., Wonders, P., & Sabine, G. (2020). Feeding disadvantaged children during the COVID-19 pandemic. In *Journal of Health Visiting* (Vol. 8, Issue 9). www.familygateway.co.uk/
15. Defeyter M, Stretesky P & Shinwell J. (2022) An evaluation of Birmingham's HAF Programme: Bring it on Brum 2022. Available: https://www.bringitonbrum.co.uk/content/uploads/2022/09/Bring-it-on-Brum-Summer-Evaluation.-Northumbria-University.pdf Accessed on: 24/04/2023
16. Dubourg, R., Hamed, J., and Thorns, J., (2005) Estimates of the economic and social costs of crime in England and Wales: Costs of crime against individuals and households, 2003/04. Available from: http://webarchive.nationalarchives.gov.uk/20100413151441/http:/www.homeoffice.gov.uk /rds/pdfs05/rdsolr3005.pdf Accessed: 25/04/2023
17. Ebbeling, C. Pawlak, D. Ludwig, D. (2002) Childhood obesity: publichealth crisis, common sense cure. Available: http://www.indiana.edu/~k536/ articles/youth/crisis%20Ebbeling%202002.pdf Accessed: 24/04/2023.
18. Ellickson Phyllis L, Tucker Joan S, Klein David J. (2003) Ten-year prospective study of public health problems associated with early drinking. *Pediatrics.* 111:949e55
19. Evans GW, Kim P. (2013) Childhood poverty, chronic stress, self-regulation, and coping. *Child Dev Perspect* 7:43–8.
20. Evans, E. W., Wing, R. R., Pierre, D. F., Howie, W. C., Brinker, M., & Jelalian, E. (2020). Testing the effect of summer camp on excess summer weight gain in youth from low-income households: a randomized controlled trial. *BMC public health*, *20*, 1-10.
21. Farrington, D.P. (2005). Childhood origins of Antisocial Behaviour. *Clinical Psychology and Psychotherapy*, 12, 177-190
22. Fujiwara, D. et al., (2015) Further analysis to value the health and educational benefits of sport and culture. *DCMS.* Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_ data/file/446273/Health_and_educational_benefits_of_sport_and_culture.pdf Accessed: 25/04/2023
23. Gable, S. Krull, J. Chang, Y. (2009) Implications of Overweight Onset and Persistence for Social and Behavioral Development Between Kindergarten Entry and Third Grade. Available: http://www.tandfonline.com/doi/ abs/10.1080/10888690902801970 Accessed: 25/04/2023
24. Gaik, L. P., Abdullah, M. C., Elias, H., & Uli, J. (2010). Development of antisocial behaviour. *Procedia-social and behavioral sciences*, *7*, 383-388.
25. Gov.uk. "New obesity treatments and technology to save the NHS billions" (2022) Available at: https://www.gov.uk/government/news/new-obesity-treatments-and-technology-to-save-the-nhs-billions#:~:text=Obesity%20costs%20the%20NHS%20a,billion%20each%20year%20by%202050. Accessed on: 20/04/2022
26. Graham, P. L., Crilley, E., Stretesky, P. B., Long, M. A., Palmer, K. J., Steinbock, E., & Defeyter, M. A. (2016). School Holiday Food Provision in the UK: A Qualitative

Investigation of Needs, Benefits, and Potential for Development. *Frontiers in Public Health*, *4*;1–8. https://doi.org/10.3389/fpubh.2016.00172

27. James, M., Marchant, E., Defeyter, M. A., Woodside, J. V, & Brophy, S. (2021). Impact of School Closures on the Health and Well-Being of Primary School Children in Wales UK; A Routine Data Linkage Study Using the HAPPEN Survey (2018-2020). *The Lancet*, *(Pre-print* (5), 7352–7363.
28. Karnick, S. Kanekar, A. (2012) Childhood Obesity: A global public health crisis. Available: http://www.ncbi.nlm.nih.gov/pmc/articles/ PMC3278864/ Accessed: 24/04/2023.
29. LeMura LM, Maziekas MT. (2002) Factors that alter body fat, body mass, and fat-free mass in pediatric obesity. Medicine and Science in Sports and Exercise; 34: 487-496.
30. Loeber,R.(1982). The stability of antisocial and delinquent child behavior: A review. Child Development, 53,1431-1446
31. Luecken LJ, Lemery KS. (2004) Early caregiving and physiological stress responses. *Clin Psychol Rev.* 24:171–91
32. Meyer D, Princiotta D and Lanahan L (2004) The Summer after Kindergarten: Children's Activities and Library Use by Household Socioeconomic Status (Report). National Centre for Education Statistics Issue Brief. Available at: https://nces.ed.gov/pubsearch/pubsinfo. asp?pubid=2004037 Accessed: 24/04/2023
33. Moffitt, T. E. (1993). Adolescence- limited and life-course-persistent antisocial behavior: A developmental taxonomy. Psychological Review, 100, 674-701
34. Morgan, K., Melendez-Torres, G., Bond, A., Hawkins, J., Hewitt, G., Murphy, S., & Moore, G. (2019). Socio-Economic Inequalities in Adolescent Summer Holiday Experiences, and Mental Wellbeing on Return to School: Analysis of the School Health Research Network/Health Behaviour in School-Aged Children Survey in Wales. *International Journal of Environmental Research and Public Health*, *16*(7), 1107. https://doi.org/10.3390/ijerph16071107
35. Murphy, S. The Social Value of Youth Work. (2019) Available: https://www.linxyouthproject.co.uk/wp-content/uploads/2020/06/Linx-SROI-Analysis-Report-FINAL-180620.pdf Accessed: 24/04/2023
36. National Audit Office (2020) "Childhood Obesity" Available at: https://www.nao.org.uk/wp-content/uploads/2020/09/childhood-obesity.pdf Accessed on: 24/04/2023
37. National Obesity Observatory. (2011) Obesity and mental health. Available: http://www.noo.org.uk/uploads/doc/vid_10266_Obesity%20and%20 mental%20health_FINAL_070311_MG.pdf Accessed: 25/04/2023.
38. NHS Digital. "Latest obesity figures for England show a strong link between children living with obesity and deprivation.." (2022) Available: https://digital.nhs.uk/news/2022/national-child-measurement-programme-21-22 Accessed on: 20 May 23
39. Parliament.uk "Government Response to the House of Commons Health and Social Care Select Committee report on Childhood obesity: Time for action, Eighth Report of Session 2017–19" (2017) Available at: https://www.parliament.uk/globalassets/documents/commons-

committees/Health/Correspondence/2017-19/Childhood-obesity-Government-Response-to-eighth-report-17-19.pdf Accessed on: 23/04/2022
40. Patterson, G., DeBaryshe, B.,& Ramsey, E. (1990). A Developmental Perspectives on Antisocial Behavior. American Psychologist, 44, 329-335.
41. Patterson, G.R. (1992). Developmental changes in antisocial behaviour. In R.D. Peters, R.J. MacMahon & V.L.
42. Pizzi M, Vroman K. (2013) Childhood obesity: effects on children's participation, mental health, and psychosocial development. *Occupational Therapy in Health Care*. 27:99–112. 10.3109/07380577.2013.784839
43. Robinson TN. (1999) Reducing children's television viewing to prevent obesity: a randomized controlled trial. *Journal of the American Medical Association.* 282: 1561-1567
44. Royal Society for Public Health, Vision, Voice and Practice (2015) Tackling the UK's childhood obesity epidemic. Available: https://www.rsph.org.uk/static/uploaded/de21cde9-a77d-4ce6-bf9342c51f2beb08.pdf Accessed on: 24/04/2023
45. Serdula MK, Ivery D, Coates RJ, Freedman DS, Williamson DF, Byers T. (1993) Do Obese Children Become Obese Adults? A Review of the Literature. *Preventive Medicine*. 22(2):167–77. 10.1006/pmed.1993.1014
46. Shinwell, J. & Defeyter, M.A**.** (2017). Investigation of summer learning loss in the UK: Implications for holiday club provision. *Frontiers in Public Health, 5*, 270.
47. Simmonds M, Llewellyn A, Owen CG, Woolacott N. (2016) Predicting adult obesity from childhood obesity: a systematic review and meta-analysis. *Obes Rev.* 17(2):95-107.
48. Stanner, S. (2004). At Least Five a Week–a summary of the report from the Chief Medical Officer on physical activity.
49. Staff, J., Whichard, C., Siennick, S. E., & Maggs, J. (2015). Early life risks, antisocial tendencies, and preteen delinquency. *Criminology*, *53*(4), 677-701.
50. Shinwell, J., & Defeyter, M. A. (2021). *Food Insecurity: A Constant Factor in the Lives of Low-Income Families in Scotland and England*. *9*(May), 1–14. https://doi.org/10.3389/fpubh.2021.588254
51. Stewart, H., Watson, N., & Campbell, M. (2018). The cost of school holidays for children from low-income families. *Childhood*, *25*(4), 516-529.
52. Stretesky, P. B., Defeyter, M. A., Long, M. A., Ritchie, L. A., & Gill, D. A. (2020). Holiday hunger and parental stress: Evidence from North East England. *Sustainability*, *12*, 1–18. https://doi.org/10.3390/su12104141
53. Summer Learning Association (2009) Doesn't Every Child Deserve a Memorable Summer? Available at: http://www.summerlearning.org Accessed:25/04/2023
(1) Thornberry Terence P, Krohn Marvin D. (2003) Taking stock of delinquency: An overview of findings from contemporary longitudinal studies. *Springer Science & Business Media.*
(2) Tremmel, M., Gerdtham, U. G., Nilsson, P. M., & Saha, S. (2017). Economic burden of obesity: a systematic literature review. *International journal of environmental research and public health*, *14*(4), 435.

(3) Van Lancker, W., & Parolin, Z. (2020). COVID-19, school closures, and child poverty: a social crisis in the making. *The Lancet*. https://doi.org/https://doi.org/10.1016/S2468-2667(20)30084-0
(4) Volmut, T., Pišot, R., Planinšec, J., & Šimunič, B. (2021). Physical activity drops during summer holidays for 6-to 9-year-old children. *Frontiers in public health*, *8*, 631141.
(5) Von Drehle D (2010) The case against summer vacation. Time. Available at: http://content.time. com/time/magazine/article/0,9171,2005863,00.html Accessed: 25/04/2023
(6) Wijga A, Scholtens S, Bemelmans W, de Jongste J, Kerkhof M, Schipper M. (2010) Comorbidities of obesity in school children: a cross sectional study in the PIAMA birth cohort. *BMC Public Health*. 10(184). 10.1186/1471-2458-10-184
(7) Wong, R. S. M., Yu, E. Y. T., Guo, V. Y., Wan, E. Y. F., Chin, W. Y., Wong, C. K. H., ... & Lam, C. L. K. (2018). A prospective cohort study to investigate parental stress and child health in low-income Chinese families: protocol paper. *BMJ open*, *8*(2), e018792.
(8) World Health Organisation (WHO) (2015) Children's Environmental Health: Emerging issues. Available: http://www.who.int/ceh/risks/cehmobility/en/ Accessed: 24/04/2023.
54. USDA Economic Research Services. (2020). *Survey Tools*. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/survey-tools/#six