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Executive Summary

**In response to this call for evidence on Food, Diet and Obesity,
we make the following recommendations:**

Policy Recommendations:

- A life course approach should be adopted for effective obesity prevention policies and interventions.
- Taking a whole systems approach, beyond diet, consider the influence of physical activity, other health behaviours and wider determinants of health – as well as their interrelationships – on obesity.
- Obesity prevention efforts should take a dual-approach and include population-level policies and interventions, as well as support for individuals who may become pregnant / a parent.
- In the setting of advocacy for more sustainable diets that are likely to be less nutrient dense, the findings suggest a need to reappraise dietary recommendations for preconception and pregnancy and to consider further the role of multiple micronutrient supplements in women living in higher-income countries.
- Diet-related obesity prevention should take an integrated lifecourse approach from preconception, through the first 1000 days and into pre-school and school settings, and should include integrated policies that promote supportive actions at both local and national levels. Such preventive actions need to be coupled with therapeutic approaches for those with established excess weight.

The response provides evidence and policy recommendations in relation to the Questions 1, 2, 3, 4 and 5.

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QUESTIONS:

1- Key trends in food, diet and obesity, and the evidential base for identifying these trends.

1.Data from British Birth Cohort studies show that soft drink consumption has decreased, and obesity prevalence increased in adolescents across recent generations.¹ The proportions of 16/17-old girls and boys born in 1970 who consumed more than one serving of soft drink per day were 23.8% and 30.8%, respectively, compared with 18.2% and 18.6% among girls and boys born more recently in 2000-2002. On the other hand, the prevalence of obesity in this age group has surged, with adolescents born in 2000-2002 being around five times (girls) to six times (boys) more likely to be living with obesity when compared to their counterparts who were born in 1970 (11.5% and 12.2% vs. 2.4% and 2.1% for girls and boys, respectively).

2.Analyses of trends in child obesity before, during and after the COVID-19 pandemic using National Child Measurement Programme data have shown a rapid return to pre-pandemic levels of overweight and obesity in children aged 4-5 years, suggesting that preventive policies can be particularly effective in the under-fives. In older children, obesity rates after the pandemic did not return to pre-pandemic levels, in keeping with other research showing that, once established, obesity has proven to be difficult to reverse.²

3.Obesity tracks into adulthood, with 60-85% of children with obesity remaining obese in adulthood; recent data from the national Maternity Services Data Set shows that an increasing proportion of women enter pregnancy with obesity,³ creating an intergeneration cycle of obesity.

¹ Righton O, Flynn A, Alwan N, Schoenaker D. Preconception health in adolescence and adulthood across generations in the UK: findings from three British birth cohort studies. MedRxiv (preprint). 2024. Doi: 10.1101/2024.02.06.24302400.

² Ochoa-Moreno I, Taheem R, Woods-Townsend K, Chase D, Godfrey KM, Modi N, Hanson M. Projected health and economic effects of the increase in childhood obesity during the COVID-19 pandemic in England: The potential cost of inaction. PLoS One. 2024 Jan 24;19(1):e0296013. doi: 10.1371/journal.pone.0296013.

³ NHS England. Maternity Services Monthly Statistics. <https://digital.nhs.uk/data-and-information/publications/statistical/maternity-services-monthly-statistics>.

4. **Policy recommendation:** A life course approach should be adopted for effective obesity prevention policies and interventions.

2- The primary drivers of obesity both amongst the general population and amongst distinct population and demographic groups.

5. Child obesity has a high prevalence, with consequences for brain, mental and physical health, and with widening disparities in the UK.

6. At the population level, current policy actions have to date been focused primarily on fiscal measures to reduce childhood intake foods high in sugar; however, these have proven ineffective in preventing further widening of disparities in child obesity. Our research indicates that poor quality infant and childhood diets are an important driver of childhood obesity.⁴

7. Alongside childhood diet, low levels of childhood physical activity are an important primary driver of childhood obesity; our objective data have shown that only 53% of six-year-olds in Britain meet the recommended daily guidelines for moderate-to-vigorous physical activity.⁵

8. Child obesity is generally preceded by large infant size at birth and/or rapid infant weight gain, with infants being set on a trajectory to later obesity. Research worldwide has shown important perinatal drivers of child obesity, including maternal obesity, smoking and high dietary glycemic index and blood sugar levels during pregnancy, excessive pregnancy weight and short duration of breastfeeding.^{6,7,8}

9. Maternal obesity, as an important driver of lifelong obesity in women as well as obesity in the next generation, is strongly influenced by women's

⁴ Okubo H, Crozier SR, Harvey NC, Godfrey KM, et al. Diet quality across early childhood and adiposity at 6 years: the Southampton Women's Survey. *Int J Obes (Lond)*. 2015 Oct;39(10):1456-62. doi: 10.1038/ijo.2015.97.

⁵ Hesketh, KR et al. Activity behaviours in British 6-year-olds: cross-sectional associations and longitudinal change during the school transition. *Journal of Physical Activity & Health*; 11 Aug 2022; DOI: 10.1123/jpah.2021-0718

⁶ Robinson SM, Crozier SR, Harvey NC, Barton BD, Law CM, Godfrey KM, Cooper C, Inskip HM. Modifiable early-life risk factors for childhood adiposity and overweight: an analysis of their combined impact and potential for prevention. *Am J Clin Nutr*. 2015 Feb;101(2):368-75. doi: 10.3945/ajcn.114.094268.

⁷ Okubo H, Crozier SR, Harvey NC, Godfrey KM, Inskip HM, Cooper C, Robinson SM. Maternal dietary glycemic index and glycemic load in early pregnancy are associated with offspring adiposity in childhood: the Southampton Women's Survey. *Am J Clin Nutr*. 2014 Aug;100(2):676-83. doi: 10.3945/ajcn.114.084905.

⁸ Aris IM, Bernard JY, et al. Modifiable risk factors in the first 1000 days for subsequent risk of childhood overweight in an Asian cohort: significance of parental overweight status. *Int J Obes (Lond)*. 2018 Jan;42(1):44-51. doi: 10.1038/ijo.2017.178.

socio-demographic factors.^{9,10} For example, the prevalence of obesity before and in early pregnancy is much higher among women from black ethnic minority groups (33.7%) compared with women in white, Asian, mixed or other ethnic groups (17.3-24.1%). The proportion of women entering pregnancy is also twice as high among women living in the most deprived areas (29.0%) compared with the least deprived areas in England (15.3%). Socio-demographic characteristics are strong determinants of food, diet, obesity, and related health behaviours, and distinct population and demographic groups may require specific appropriately targeted interventions.

10. A local authority led whole systems approach to obesity and childhood obesity in Southampton has found the underlying local drivers to be time and resource poor families; local policies prioritising profit over a healthy weight environment; public spaces perceived to be unsafe, unpleasant and inaccessible; and mixed signals at national, local and community level.¹¹

11. **Policy recommendation:** taking a whole systems approach, beyond diet, consider the influence of physical activity, other health behaviours and wider determinants of health – as well as their interrelationships – on obesity.

3- The impacts of obesity on health, including on children and adolescent health outcomes.

12. Maternal obesity is associated with a large number of adverse outcomes for mothers and their children.¹² Before and during early pregnancy, maternal obesity is strongly associated with increased risks for the mother (e.g. pregnancy complications such as gestational diabetes and hypertensive disorders) and the foetus (e.g. stillbirth and congenital anomalies). Maternal obesity has lasting consequences for the offspring,

⁹ Schoenaker D, Stephenson J, Smith H, Thurland K, Duncan H, Godfrey KM, Barker M, Singh C, Alwan NA, for the UK Preconception Partnership. Women's preconception health in England: a report card based on cross-sectional analysis of national maternity services data from 2018/2019. BJOG. 2023;130(10):1187-95. doi: 10.1111/1471-0528.17436.

¹⁰ UK Government Office for Health Improvement and Disparities. Report card: indicators of women's preconception health. 2022. <https://www.gov.uk/government/publications/report-card-indicators-of-womens-preconception-health>

¹¹ Taheem R, Woods-Townsend K, Lawrence W, Baird J, Godfrey KM, Hanson M. How do local authority plans to tackle obesity reflect systems thinking? *Perspect Public Health*. 2023 Nov;143(6):324-336. doi: 10.1177/17579139221106337.

¹² Caut C, Schoenaker D, McIntyre E, Vilcins D, Gavine A, Steel A. Relationships between Women's and Men's Modifiable Preconception Risks and Health Behaviors and Maternal and Offspring Health Outcomes: An Umbrella Review. *Semin Reprod Med*. 2022;40(3-04):170-183. doi: 10.1055/s-0042-1744257.

increasing the risk of child obesity and associated co-morbidities such as diabetes and heart disease, as well as being associated with adverse child neurocognitive development outcomes such as autism spectrum disorder, and emotional/behavioural problems.¹³

13. Many women gain weight during and after pregnancy, with their weight increasing with the number of children they have. Interpregnancy weight gain, even within the 'normal weight' category, in turn increases risks of complications in a subsequent pregnancy, such as gestational diabetes and giving birth to a large-for-gestational-age neonate.

14. Independent of maternal obesity, paternal obesity may also be associated with child obesity. Increasing evidence suggests children born to fathers with obesity have a higher birthweight, increased risk of macrosomia (birthweight >4000g), and childhood obesity.¹⁴

15. **Policy recommendation:** Obesity prevention efforts should take a dual-approach and include population-level policies and interventions, as well as support for individuals who may become pregnant / a parent.

4- The influence of pre- and post-natal nutrition on the risk of subsequent obesity, and the specific influences on the diet of children and adolescents that contribute to the risk of becoming obese.

16. Primary prevention of child obesity is a critical unmet need – this needs to commence pre-birth, with developmental preconception/pregnancy influences now recognised as playing a major role. Pre- and post-natal influences on the risk of subsequent obesity are mentioned in the response to Question 2. Our recent randomised controlled trial in the UK, Singapore and New Zealand showed that supplementation of mothers with an enriched supplement, containing vitamins B2, B6, B12, D, with probiotics and myoinositol before conception and during pregnancy led to a lower risk of rapid infant weight gain and a halving of the risk of obesity in their children by the age of

¹³ Dalrymple KV, El-Heis S, Godfrey KM. Maternal weight and gestational diabetes impacts on child health. *Curr Opin Clin Nutr Metab Care*. 2022 May 1;25(3):203-208. doi: 10.1097/MCO.0000000000000826.

¹⁴ Carter T, Schoenaker D, Adams J, Steel A. Paternal preconception modifiable risk factors for adverse pregnancy and offspring outcomes: a review of contemporary evidence from observational studies. *BMC Public Health*. 2023;23(1):509. doi: 10.1186/s12889-023-15335-1.

two.¹⁵ Over 90% of the participants in this trial had marginal or low concentrations of one or more of folate, riboflavin, vitamin B12, or vitamin D during preconception, and many developed markers of vitamin B6 deficiency in late pregnancy.¹⁶

17. **Policy recommendation:** In the setting of advocacy for more sustainable diets that are likely to be less nutrient dense, the findings suggest a need to reappraise dietary recommendations for preconception and pregnancy and to consider further the role of multiple micronutrient supplements in women living in higher-income countries.

5- Lessons learned from international policy and practice, and from the devolved administrations, on diet-related obesity prevention.

18. Lessons learned from the whole systems approach in the Netherlands has highlighted strategic integrated working as an important driver of success with interventions encompassing

- Preventive interventions during the first 1,000 days,
- Preventive interventions pre-schools and schools
- Targeted interventions in local neighbourhoods
- National and regulatory policies targeting healthy environments (including urban design and regulation of the food and drinks industry, such as restricting unhealthy marketing to children).
- Treatment interventions to support children and young people with excess weight to regain a healthy weight. (RT ref [National and Local Strategies in the Netherlands for Obesity Prevention and Management in Children and Adolescents \(karger.com\)](#))

19. **Policy recommendation:** Diet-related obesity prevention should take an integrated lifecourse approach from preconception, through the first 1000 days and into pre-school and school settings, and should include integrated policies that promote supportive actions at both local and national levels. Such preventive actions need to be coupled with therapeutic approaches for those with established excess weight.

¹⁵ Lyons-Reid J, Derraik JGB, Kenealy T, et al. Impact of preconception and antenatal supplementation with myo-inositol, probiotics, and micronutrients on offspring BMI and weight gain over the first 2 years. BMC Med. 2024 Jan 30;22(1):39. doi: 10.1186/s12916-024-03246-w.

¹⁶ Godfrey KM, Titcombe P, El-Heis S, et al. Maternal B-vitamin and vitamin D status before, during, and after pregnancy and the influence of supplementation preconception and during pregnancy: Prespecified secondary analysis of the NiPPeR double-blind randomized controlled trial. PLoS Med. 2023 Dec 5;20(12):e1004260. doi: 10.1371/journal.pmed.1004260.

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