House of Lords Food, Diet and Obesity Committee Inquiry

Response from CLOSER, the home of longitudinal research (UCL Social Research Institute)

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1. About us:

1.1 CLOSER, the home of longitudinal research[1], is the UK's partnership of leading social and biomedical longitudinal population studies and works to increase their visibility, use and impact. Our partner studies[2] comprise national and regional studies from across the UK. CLOSER partner studies include the British Birth Cohort Studies, Millennium Cohort Study, Born in Bradford, Growing Up in Scotland, the Avon Longitudinal Study of Parents and Children, Understanding Society – the UK Household Longitudinal Study, and more.

1.2 CLOSER has been funded by the UKRI Economic and Social Research Council (ESRC) since 2012 and is based at the UCL Social Research Institute.

2. Our reason for submitting evidence:

2.1 CLOSER represents multiple longitudinal population studies across the UK. These national scientific assets follow the same people and households over time, often from birth, collecting a wide array of data and information about study participants, which enable researchers and policymakers to explore people's complex lives and how changes in society affect health, community and life chances. CLOSER's strategic position in the research landscape and birds' eye view of the UK's longitudinal population studies makes it an ideal vehicle for identifying and communicating evidence to inform policy.

2.2 The UK's longitudinal population studies are recognised as vital sources of evidence on how diets and associated health implications affect people across the life course, providing insights into individual short and long-term change and the relationship between different elements of people's complex lives that cannot be obtained from any other data sources. They allow researchers to explore how different groups vary, and how and why people's lives change, enabling a greater understanding of the difference between causal relationships and correlation.

2.3 Several UK longitudinal population studies collect data about the diets of participants, including on family patterns of eating, ultra-processed foods, and nutritional intake. Data from longitudinal population studies has been used in research assessing the impact of diet on development and wellbeing, including:

[1] https://www.closer.ac.uk
[2] https://www.closer.ac.uk/timeline/

- Understanding Society[3]
- The Millennium Cohort Study (MCS)[4]
- The English Longitudinal Study of Ageing (ELSA) [5]
- The Avon Longitudinal Study of Parents and Children (ALSPAC)[6]
- Growing Up in Scotland (GUS)[7]
- Born in Bradford[8]
- Southampton Women's Survey[9]

2.4 Research using these studies' data has investigated the impact of diet on overweight and obesity in later life, including transitions into and out of overweight and obesity. Research has also investigated which factors are likely to lead to a poorer diet, especially regarding dietary habits developed early in life, or passed down from a child's parents. Evidence from longitudinal population studies has proven particularly helpful in understanding the effects overweight and obesity can have on individuals' physical and mental health as they age.

The use of longitudinal population studies and the ability to adjust for other parts of people's lives is especially important and something other sources of information struggle to offer.

2.5 Our response focuses on the following questions in the call for evidence:

- Key trends in food, diet and obesity, and the evidential base for identifying these trends.
- The primary drivers of obesity both amongst the general population and amongst distinct population and demographic groups.
- The impacts of obesity on health, including on children and adolescent health outcomes.
- 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.
- The cost and availability of a) UPF and b) HFSS foods and their impact on health outcomes.
- Policy tools that could prove effective in preventing obesity amongst the general population, including those focussed on the role of the food and drink industry in tackling obesity.

3. What is the current understanding of how screen time can support or impact children's wellbeing and mental health, including the use of social media?

[3] https://closer.ac.uk/study/understanding-society/
[4] https://closer.ac.uk/study/millennium-cohort-study/
[5] https://closer.ac.uk/study/english-longitudinal-study-of-ageing/
[6] https://closer.ac.uk/study/alspac-children-90s/
[7] https://closer.ac.uk/study/growing-up-in-scotland/
[8] https://closer.ac.uk/study/born-in-bradford/
[9] https://closer.ac.uk/study/southampton-womens-survey/

3.1 General trends in food, diet and obesity since the 1940s

- From observing 56,632 participants in studies spanning births between 1946-2001 and ages from 2-64 years researchers have found that adults are becoming overweight at increasingly younger ages[1].
    - Study participants born after the 1980s had probabilities of overweight or obesity in childhood that were two to three times greater than those born before the 1980s [1].
- Busy lifestyles and the availability of convenience foods have led to changes in the way we eat. This is reflected in research using data from the 1970 British Cohort Study, which follows the lives of more than 17,000 people born in England, Scotland and Wales during a single week in 1970.
    - 28% of the cohort ate ready meals at least once or twice a week and 47% said they ate other convenience foods, like packaged or frozen fish-fingers, burgers, oven chips, or ready-made pizzas, at least once a week [2].
    - 25% of cohort members ate takeaways at least once or twice a week. This was the dietary behaviour most strongly related to being overweight. Nearly a third of cohort members who were obese ate takeaways at least once a week, compared to 21% of those who were normal weight [2].
- One of CLOSER's partner studies following children born in the Avon area of South West England between 1991-1992 (The Avon Longitudinal Study of Parents and Children, or ALSPAC) found that children's diets during the preschool years saw a large increase in the intake of free (added) sugars, likely due to increased consumption of energy-dense nutrient-poor foods [3]. This increase in free sugar intake remained similar until adolescence.
    - Meanwhile, low intakes of vitamin D were common throughout childhood. At preschool ages, all children in the study had dietary intakes of vitamin D below the UK dietary recommendation [3].
- Research using ALSPAC also found that fruit and vegetable intakes were low at all ages [3]. However, the Born in Bradford study found evidence that the five-a-day messaging is starting to get through, with the median consumption of fruit and vegetables for children aged 3 years at six times per day (although the amount of fruit/vegetables eaten at each time was not known) [4]. This is particularly beneficial as it could displace the consumption of unhealthy free sugars which was observed in ALSPAC participants at this young age.

3.2 Trends in food, diet and obesity across the life course

- Diet at age 12 months has not been shown to be associated with BMI at age 36 months. However, a higher consumption of vegetables at 18 and 36 months was associated with a lower BMI at 36 months [4].
- Growing Up in Scotland, a longitudinal population study following young people born in Scotland in 2004/05, found that children are more likely to be overweight or obese at age ten years than age six years. By age ten years, 34% of children were

overweight including 19% who were obese. On average, BMI had increased by 2.5 BMI points for all children over the period from age six to ten years [5].
    - 79% of children who were a healthy weight at age six years remained a healthy weight at age ten years. However, around 12% became overweight and a further 8% became obese [5].
    - Children already overweight or obese at age six years were more likely to remain so or to see their BMI increase over the following four years than to see their BMI decrease. Amongst children who were overweight at age six years, 34% remained overweight and 33% became obese at age ten years. Around 34% returned to a healthy weight [5].
    - The majority of children who were obese at age six years remained so at age ten years (79%) [5].
- These trends found in Growing Up in Scotland are supported by evidence from ALSPAC which shows that children who were overweight or obese in early or mid-childhood were much more likely than normal-weight children to be obese as adolescents [3].
- The English Longitudinal Study of Ageing (ELSA) has proven very useful in uncovering trends in obesity among the older population.
    - BMI is known to decline in older adults, but this may reflect a loss of muscle mass instead of fat mass. A decrease in waist circumference (a measure of abdominal body fat) is delayed by nine years after the start of a decrease in BMI in older people. This means that from age 70 onwards, the decrease in BMI may reflect a loss of muscle mass not compensated by an increase in fat mass, whereas an age-related change in the fat distribution is reflected by a still increasing waist circumference [6].

3.3 Socioeconomic inequalities

- Using data from national British birth cohort studies, researchers identified large and persisting socioeconomic inequalities in BMI from age 20 up to ages 60-64 [7].
    - Inequalities in BMI according to childhood socioeconomic position were typically larger at older ages, and were similar in magnitude at any given age when using cohorts born in 1946, 1958 and 1970 [7].
- In childhood and adolescence, low socioeconomic position was associated with lower weight in earlier born cohorts (1946-1970), but with higher weight in the 2001 Millennium Cohort Study [8].
    - Income and wealth inequality have increased since the 1970s, and some evidence suggests that the price of healthy food items has increased in recent decades [8]. Taken together these could explain the finding that younger cohorts have higher weights.
- English older adults (aged ≥52) in the poorest wealth quintile display significantly higher BMI and waist circumference than those in the richest quintile, with the gap between richer and poorer remaining even at older ages [6].

3.4 Policy implications

- More children in the UK are overweight or obese than in previous generations and, if observed trends in adulthood BMI continue, most children are likely to develop overweight or obesity at some point in their lives, and at younger ages than previous generations [1].
- Given that BMI tends to track all the way across life, interventions will be most effective when initiated as early as possible. For example, because a key factor predicting overweight or obesity at age ten years was weight at age six years, addressing factors associated with early years weight and thus increasing the proportion of younger children of healthy weight would have a knock-on effect, reducing levels of overweight down the line [5].
    - Researchers using the Growing Up in Scotland study have found that parental recognition of child overweight or obesity is poor, suggesting many parents are ill-informed or find it hard to recognise [5]. Interventions to reduce child weights would benefit from improving the understanding of parents and families in this regard.
- Tackling the higher rates of overweight or obesity in socioeconomically disadvantaged groups should be a priority for policymakers. Without effective intervention, researchers anticipate BMI inequalities to widen further throughout adulthood, with considerable public health and economic implications [8].
- Men, especially in middle-age, are more overweight and obese than women. Alerting men to their BMI status and the health risks associated with this should be a priority [2].
    - Carrying excess weight is far more socially acceptable for men than for women. Findings indicate that overweight men are far less likely than overweight women to recognise that they are overweight and are therefore less likely to be attempting to lose weight [2].
    - This is especially concerning given that cardiovascular disease is the leading cause for men aged over 35, and overweight and poor diet are major risk factors [2].

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

4.1 Social inequality and obesity

- In research on cohorts born from 1946-1970, socioeconomic inequalities in the adoption of poorer lifestyle behaviours (higher fast-food intake, lower consumption of fruit and vegetables, and breakfast skipping) are apparent in childhood and adolescence, with those from lower socioeconomic positions displaying worse profiles [9].
    - This may be because energy-dense nutrition-poor foods are less expensive compared with fresh fruit and vegetables.

    - Further, research using the more recent MCS cohort born in 2001 suggests that time and budget constraints are more serious among disadvantaged families, who may have less time to prepare meals and are less able to afford nutritious foods [10]. Researchers using ALSPAC data have found that this can extend to the choice to eat fast food [11].
- Research using data from the Born in Bradford study finds that more food insecure mothers are overweight at 12 months postpartum. Food insecure mothers and children had dietary intakes of poorer quality, with fewer vegetables and higher consumption of sugar-sweetened drinks [12].
    - Researchers suggest that the stressful nature of food insecurity may affect changes in physiological responses, such as levels of cortisol, which may influence appetite and preferences for 'comfort foods' that are higher in fat and sugar [12].

4.2 Geography

- In relation to the association of fast food outlet density and overweight, associations disappear after accounting for the confounding effect of deprivation. Deprivation is strongly associated to both density of fast food outlets and the odds of being overweight [13].
    - This is supported by the finding that proximity to fast food outlets is associated with increased weight, but only among those with maternal education below degree level [10].
    - However, an increased number of fast food restaurants around children's schools does increase BMI, with a slightly stronger association. A potential explanation is that, as students gain independence, the purchase of takeaway foods may occur on the school journey [10].
- Increased rurality has been associated with better dietary patterns, and lower snacking. Researchers found that children in rural households were more likely to consume healthier diets than those in urban households, even after adjustment for potential confounding factors [14].

4.3 Education

- In the 1958 National Child Development Survey, lower childhood IQ scores are associated with an increased prevalence of adult obesity at age 42, even after adjusting for other childhood characteristics [15].
    - Researchers suggest this may be because higher childhood IQ scores set in motion a chain of events that lead to a reduction in later life obesity risk: high IQ scores are associated with higher educational success in early adulthood, and subsequent occupational success in mid-life [15].
- British adults with self-reported intellectual impairments have higher rates of obesity and poorer nutrition than their non-disabled peers. However, a significant proportion of this may be attributable to their poorer living conditions [16].

4.4 Life course tracking

- Among cohorts born from 1946-1970, BMI tracks from childhood to adulthood more strongly at the higher end of the BMI distribution, meaning the risk of a heavy child being an adult who is overweight or obese is greater amongst children who are overweight or obese, particularly those at the extreme end of the distribution. This is concerning given the high prevalence of obesity in today's children, as it suggests a high proportion of children are likely to continue to be obese throughout life [9].

4.5 Policy implications

- Strategies aimed at reducing overweight or obesity prevalence should focus on tackling education and the drivers of social inequalities.
    - For example, local government strategies aimed solely at restricting the location of fast food outlets may be ineffective, especially when they are not tackling the underlying social inequalities and household dynamics which are often key to patterns of excess body weight and unhealthy diets [13].
    - Mediating the influences of deprivation, such as by subsidising healthy foods in schools or shops, has been demonstrated to be effective elsewhere [13].
    - Findings suggest that interventions need to go beyond placing the responsibility on the individual, instead acting at the legislative and regulatory levels. For example, a systematic review of the impact of interventions for the promotion of healthy eating observed that policies based on taxation and subsidisation of foods were most likely to reduce inequalities in weight, as they improved healthy eating outcomes in people of lower socioeconomic position [9].
- The fact that healthier diets are found in rural areas suggests that interventions in the UK may have more impact in urban areas, where poorer-quality dietary patterns are more prevalent.
- Given the association of both maternal education and childhood IQ with obesity, interventions must target educational levels within families.
    - It may be possible to alleviate the impact of education and deprivation through education about nutrition in schools, which are a means of engagement with children across demographics. This would be especially useful given the suggestion that children may begin to consume takeaway foods on their way to school as they gain independence.

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

5.1 Education

- Longitudinal research has identified that weight has complex and significant associations with educational outcomes.
- For the cohort born in 1958, no associations were found between overweight and obesity and educational outcomes. However, in the ALSPAC cohort born in 1991-92,

Comment [SJ]: Can we add in a sentence here about targeting educational levels in families? And education about nutrition for children in schools? This could be based on the Geography section findings.

a higher BMI led to worse academic outcomes [17]. This suggests that there might be a generational effect of overweight and obesity on educational outcomes.

- For ALSPAC participants, higher BMI was associated with lower GCSE scores. This was partly mediated by depressive symptoms in girls and by bullying in boys, both of which have complex interrelationships with obesity [18].
- Crucially, being overweight or obese at 16 was not as detrimental for attainment if participants had been a healthy weight at 11, suggesting it is long-term overweight and obesity that is the most problematic [19].

5.2 Disease

- In cohorts born in 1958 and 1970, an earlier age of obesity and overweight was associated with increased odds of adverse COVID-19 outcomes [20].
    - That an earlier age of becoming overweight or obese is associated with COVID-19 outcomes highlights the potential life course consequences of obesity on the immune system.
- Researchers using the ALSPAC cohort data have found that those with high and stable BMI across childhood may have lower cardiometabolic disease risk than those who do not become overweight or obese until late adolescence [21].

5.3 Eating habits

- A higher BMI at 7 years old is linked to higher levels of binge eating and overeating, and higher levels of binge eating and overeating at 13 years old are linked to higher BMI at 17 years old [22]. This supports the link between elevated BMI in childhood and disordered eating in later life.
    - Researchers also found that individuals with weight control and dietary restraint disorders are likely to gain more weight than those without such behaviours. This is concerning given higher BMI at 7 years old likely causes higher levels of weight-control behaviours in both boys and girls [22].

5.4 Policy implications

- Given the associations between a high BMI and poor educational outcomes, and their interactions with weight-related stigma, support for mental health and anti-bullying initiatives may help to alleviate the adverse social, mental health, and educational consequences experienced by young people with obesity [18].
- As with earlier sections, preventing the emergence of disordered eating in childhood is important and will reduce negative impacts later in life. It may also reduce the incidence of disordered eating habits developing as young people age into adolescence.

6. 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.

6.1 Pre-natal

- Research using data from the Southampton Women's Survey found that mother-offspring dietary trajectories are stable across early life, with poorer diet quality associated with maternal socio-demography and childhood body fat [23].
    - Diet quality remains stable from before pregnancy in the mother to age 8-9 years in the child, and a poorer diet quality is associated with a higher BMI in the mother [23].
    - ALSPAC research reinforces this, finding that association between a mother and her child's body fat at age 17 was mainly through the direct effect of maternal pre-pregnancy overweight or obesity [24].

6.2 Post-natal

- Having an overweight or obese mother has been associated with increased odds of the child being overweight or obese at 43 months old [25].
- Children from overweight or obese mothers consume greater amounts of energy from non-core foods than children with healthy or underweight mothers. Non-core foods are those considered excess to requirements for maintaining a healthy childhood diet, and are often consumed between meals as snacks [25].
    - 18 month old children with healthy weight or underweight mothers consume higher amounts of fresh fruit than those with overweight or obese mothers [25].
- Evidence suggests that introducing solid food earlier is a significant risk factor for the development of childhood obesity. Mothers who were overweight or obese before pregnancy are more likely to introduce solid food to infants earlier than mothers with normal weight [24].

6.3 Policy implications

- It is clear that the preconception period is an important window to promote positive dietary changes in order to improve childhood outcomes. This is especially important to consider given that dietary behaviours track from childhood into adolescence and adulthood, meaning children with overweight mothers will have children more likely to develop overweight or obesity throughout the life course [23].
- WHO guidance recommending that complimentary solid food feedings begin no earlier than 6 months old should be promoted, as successive infant feeding surveys in the UK have shown that the majority of children continue to be weaned before this age [24].

7. The cost and availability of a) UPF and b) HFSS foods and their impact on health outcomes.

- Research using ALSPAC data has found that higher UPF consumption is associated with greater increases in body fat from childhood to early adulthood. This is concerning given the growing consumption of UPF in children and adolescents in the UK [26].

    - Further, UPF consumption among British children is associated with multiple metabolic traits which contribute to child obesity risk [27].
- ALSPAC data has also revealed that there is an association between children with a processed food diet at age 7 years and BMI at age 17 years. Again, this supports the encouragement of a healthy diet as early in life as possible [28].
    - It is also clear that being in an 'unhealthy' dietary pattern (either eating processed foods or packed lunches, or both) at 7 years old was associated with being in the top decile of BMI at age 17 years regardless of what dietary pattern the individual followed at later ages [28]. This suggests that age 7 years may be a critical period in the life course for the development of obesity in early adulthood.
- Policies are emerging that explicitly target UPF consumption. Public health authorities in Brazil, Uruguay, Ecuador, Peru, France, Canada, and Israel have amended their national dietary guidelines with recommendations to limit UPF consumption. This is in comparison to action on UPFs in the UK (or the lack thereof), which instead emphasises the reduction of certain nutrients [26].

8. Policy tools that could prove effective in preventing obesity amongst the general population, including those focussed on the role of the food and drink industry in tackling obesity.

8.1 Targeted intervention

- Longitudinal researchers have investigated the potential impact of calorie-reduction and consumption interventions through statistical modelling and simulating interventions.
- In simulations of universal interventions, decreases in obesity prevalence among children were greatest in the lowest maternal education group, but the percentage change was greatest in the highest education group [29].
    - In simulations of interventions targeting children from highly deprived areas, obesity prevalence in the lowest educational group was substantially reduced. Given the increasing inequalities in childhood obesity, policy interventions should target those most disadvantaged [29].
- In modelling based on ALSPAC data, interventions reducing calorie intake in children were linked to reducing obesity prevalence. While reductions following these simulations were small, such changes are likely to be highly meaningful at a population level [30].

8.2 Parental feeding interventions

- In addition to the policy recommendations made throughout this submission, longitudinal researchers highlight the value of parental feeding interventions in tackling childhood obesity. These are particularly valuable given the importance of intervention early in the life course.

- Researchers outside the longitudinal community have investigated parental feeding interventions using randomised control trials. One successful example is NOURISH RCT in Australia, which enrolled parents into a program of multiple interactive group sessions focusing on responsive feeding, how to respond to feeding problems, and how to maintain effective feeding strategies. Analyses of the trial data indicated that participation led to improve feeding behaviours [31].
    - Another Australian trial delivered a similar intervention online, with parents participating in an 11-week internet-based program. Results showed that the training led to improvement in nutrition for the child [32].

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