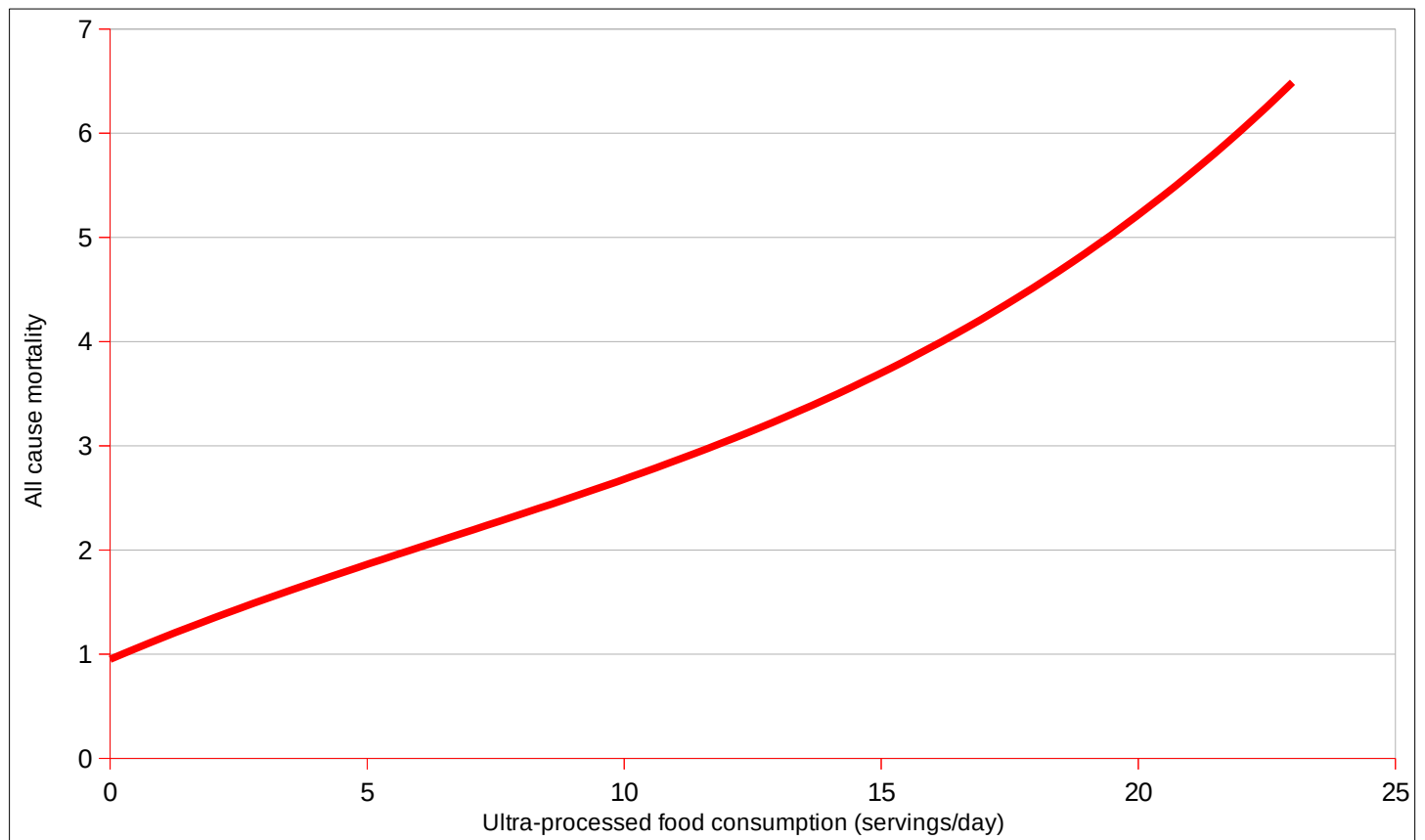


# Ultra-Processed People

by Chris van Tulleken - the missing

## Illustrations<sup>1</sup>

### 1 of 4: Why this book could save your life!



This book describes the way in which the growth imperative has forced the food industry to develop techniques for inducing consumers to eat more of their particular brands. Unfortunately, these techniques have had unwanted side effects, including increasing the incidence of a multitude of non-communicable diseases.

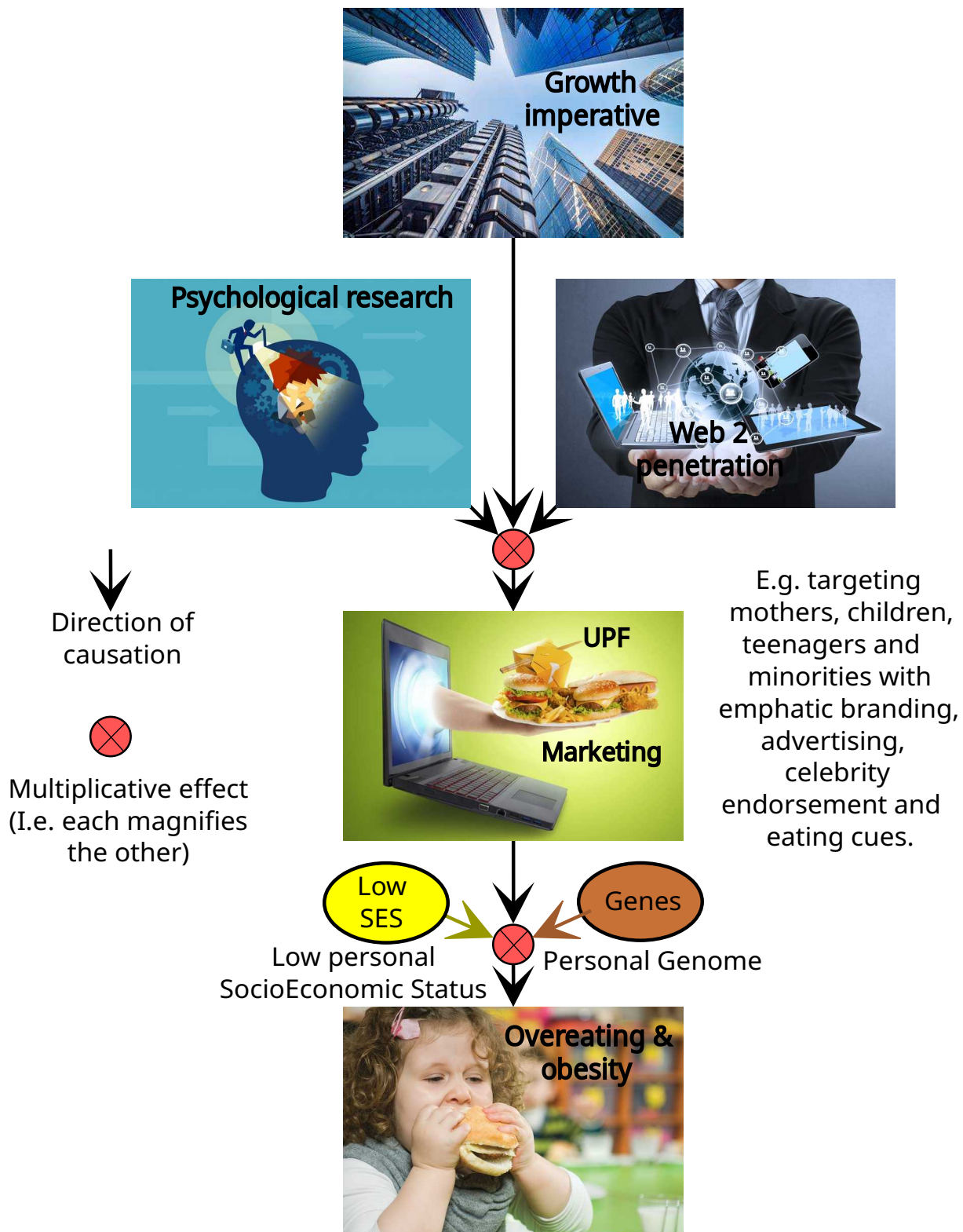
The graph<sup>2</sup> above uses the “risk of death” or “All cause mortality” to summarise the effect of these diseases, and relate this to UPF consumption in servings/day. If Ultra-Processed Food (UPF) was associated with benefit, the graph would lean downwards to the right. However, it goes steeply upwards, with mortality being 18% higher for every extra serving/day of UPF consumed.

For most populations this graph is only illustrative, since it is based on a single study of Spanish university graduates aged 20 – 91. Nor does it distinguish cause from effect. However, other research does point to UPF consumption being a (*or perhaps the*) major cause of ill-health, making me conclude that the easiest way for me and others to avoid disease, improve health, and increase life expectancy is by avoiding UPF.

<sup>1</sup> Last edited on 2023-09-25. For the latest version see <http://jim.axiomatic.biz/books/ultra-processed-people.pdf>

<sup>2</sup> From Chapter 3, Ref. 9 of Chris’s book. “Association between consumption of ultra-processed foods and all cause mortality: SUN prospective cohort study” <https://www.bmj.com/content/365/bmj.11949.full> Fig 4, but with the mortality axis changed from logarithmic to linear, and 24 points carried across and fitted to a polynomial of degree 3.

## 2 of 4: How UPF marketing has caused overeating

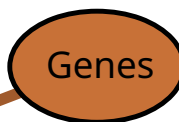
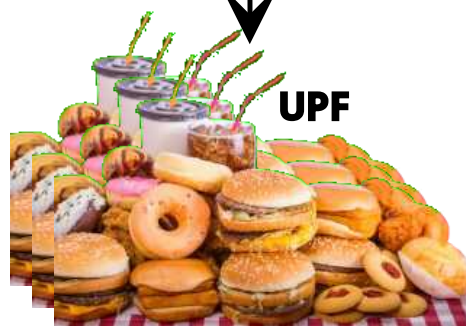


As described in Chris van Tulleken’s book, and charted above, in order to satisfy their legal obligation to maximise shareholder value, (*and in the longer term just to survive*), food manufacturers have to grow, which means increasing the amount their customers purchase and eat. New psychological insights together with the massive growth of advertising-funded (*sometimes called Web-2*) Information Technologies have enabled the marketing of food to become more effective, resulting in over-consumption, weight gain, and obesity.

### 3 of 4: How UPF formulations have added to overeating

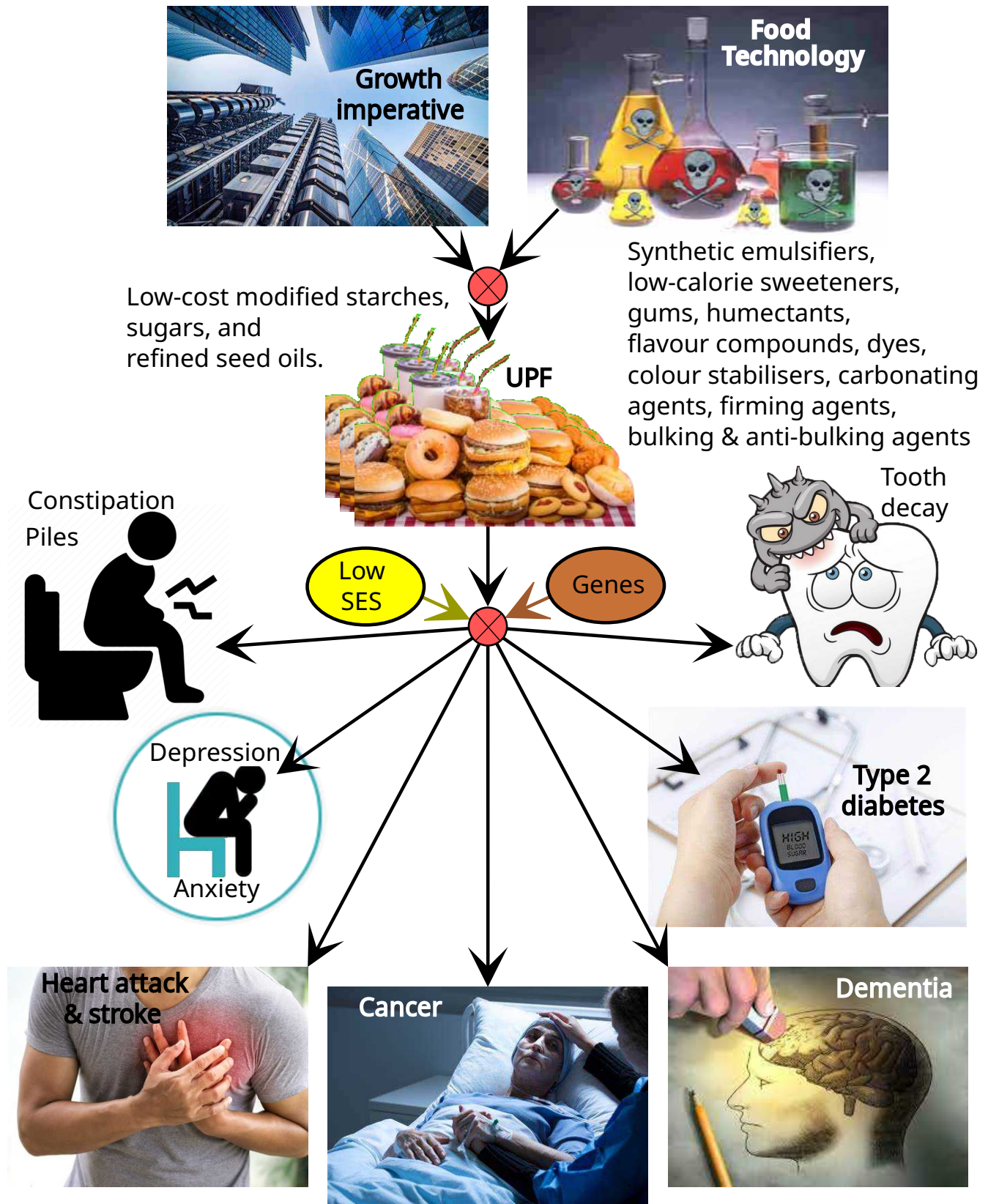


E.g. hyper palatable,  
high energy density,  
soft, rapidly eaten  
fat+sugar or  
fat+salty meals  
with little fibre



Advances in chemistry and food science have allowed Ultra Processed Food manufacturers to formulate their products to increase speed of eating, and reduce satiety, leading to further weight gain, and obesity. Susceptibility to over-eat any individual food is highly dependent on individual genetics, but made more likely by low Socio Economic Status.

## 4 of 4: How UPF formulations have led to disease

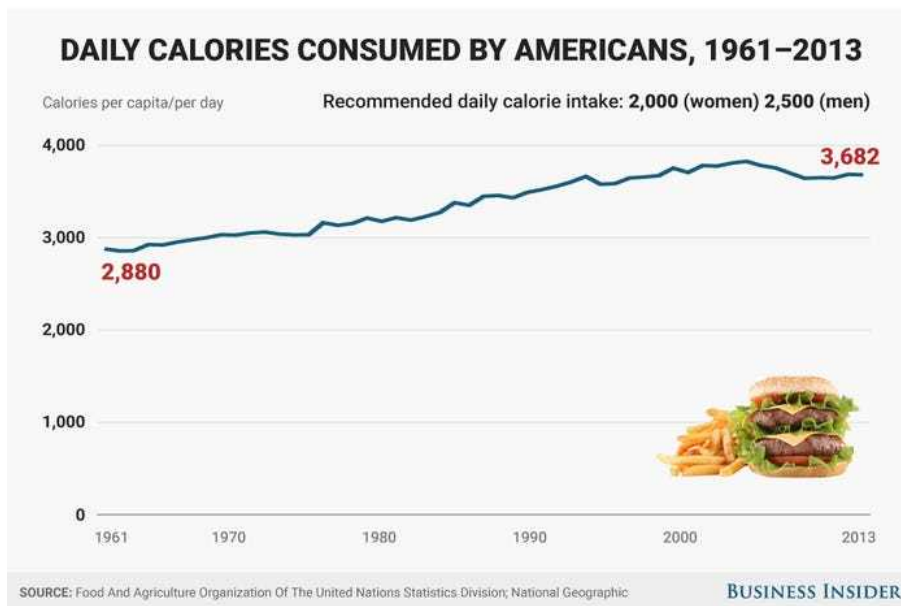
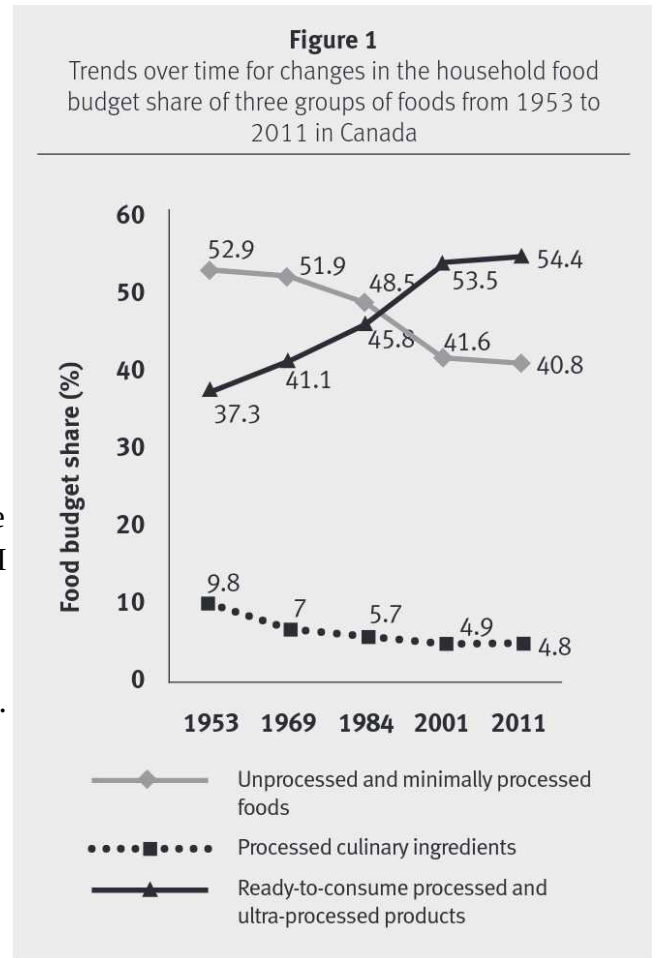


Unfortunately, while increasing food consumption, UPF also creates a number of health problems. The quickest acting can be constipation which can lead to piles, and anxiety which can lead to depression. Tooth decay follows, while other effects of eating UPF appear later and are highly individual, appearing as risk factors for type 2 diabetes, heart attacks, stroke, dementia, and early death. Again these are made more likely by low Socio Economic Status.

## 5 The Evidence

Diagrams 2: and 3: above lead me to expect that competition will have forced food manufacturers to try to increase the amount of food bought by each of their customers. Since the Internet has become largely advertising-funded, and its effectiveness has been increased by more detailed knowledge of individual users and better psychological understandings, I expect that they will have succeeded.

Indeed, the best processed food consumption chart I found shows that this happened between 1953 and 2011 in Canada<sup>3</sup>. Personal observation makes me think this also applied to the UK, and was and is only a small part of a longer run trend.



As each manufacturer increases consumption of their own products, so unless there is some barrier to this, I would expect food consumption to increase.

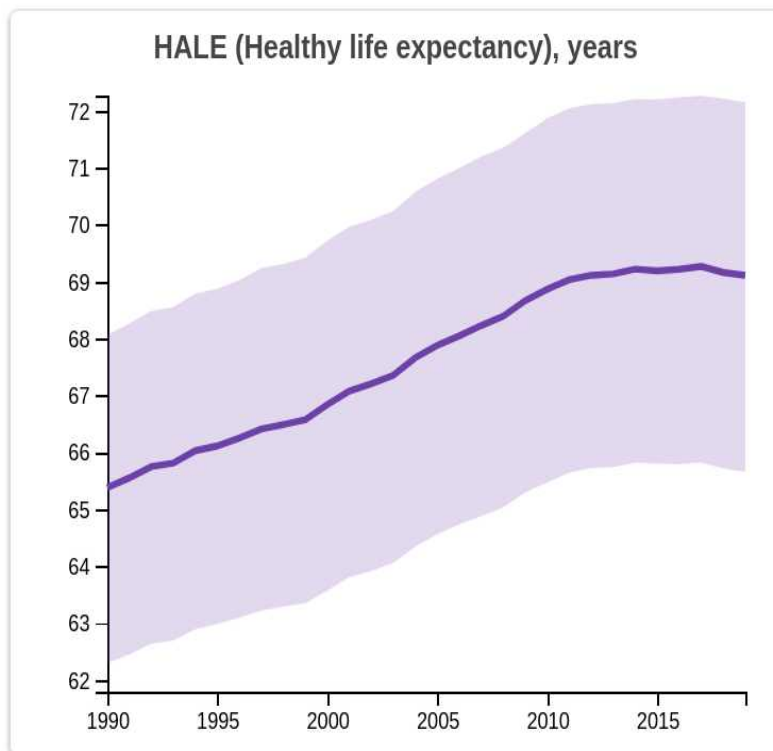
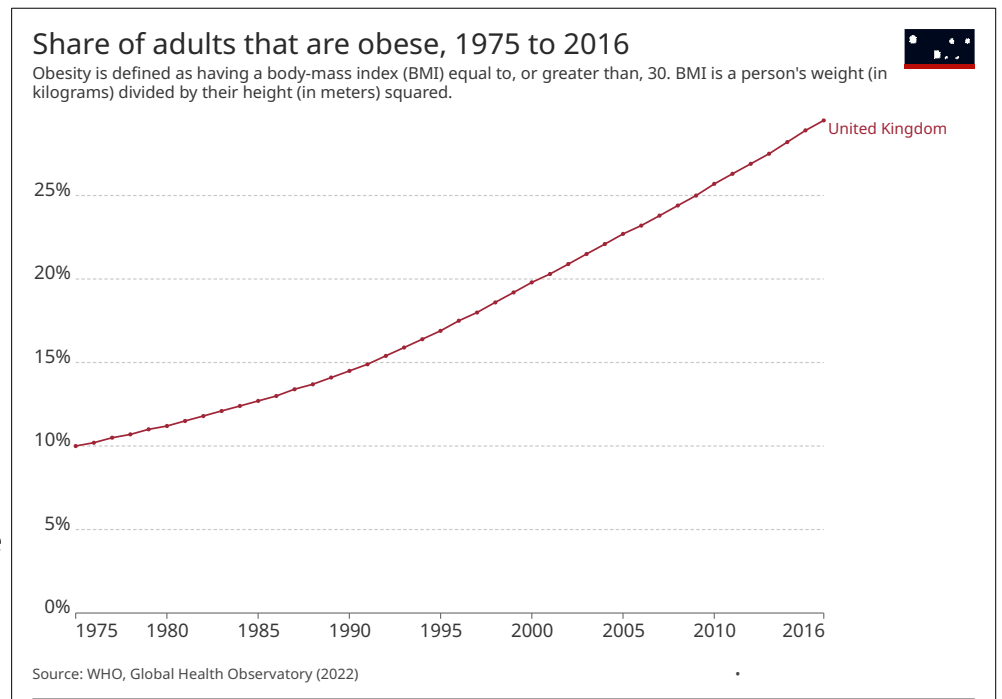
Indeed, consumption of UPF has increased as shown by the graph of total calorie intake in the US<sup>4</sup>.

<sup>3</sup> [https://www.researchgate.net/publication/260644474\\_Processed\\_and\\_Ultra-processed\\_Food\\_Products\\_Consumption\\_Trends\\_in\\_Canada\\_from\\_1938\\_to\\_2011](https://www.researchgate.net/publication/260644474_Processed_and_Ultra-processed_Food_Products_Consumption_Trends_in_Canada_from_1938_to_2011)

<sup>4</sup> <https://www.businessinsider.com/daily-calories-americans-eat-increase-2016-07>

Given an increase in calorie consumption per head, I would expect an increase in weight.

Indeed, the graph on the right<sup>5</sup> shows this is what happened in the UK.



A randomised control trial (Hall 2019), showed that not everybody exposed to UPF eats more or gains weight. Even among people who do, increased weight is not necessarily a problem. It does however represents a huge change from our evolutionary past. In the absence of a persuasive reason for thinking otherwise, I would expect this to have deleterious consequences.

Indeed, as shown by the graph on the left, since 2010, something has happened to nullify the medical advances which were previously giving us steady increases in health span. Increases in overall life expectancy have also been largely nullified, especially in the US.

5 <https://ourworldindata.org/grapher/share-of-adults-defined-as-obese?tab=chart&country=~GBR>

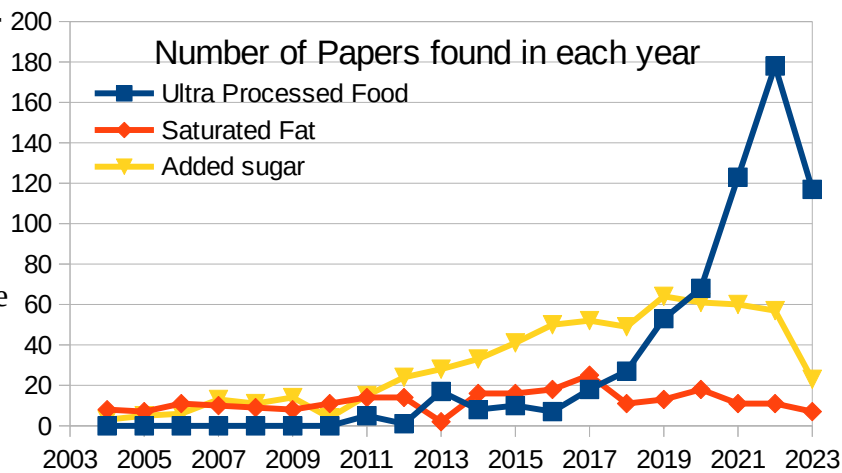
Chris's book contains an analysis of the individual causes of the non-communicable diseases limiting health and life expectancy, and finds that they are strongly associated with UPF consumption<sup>p62</sup>. Together with the number of references in brackets, these are ...

- All cause mortality (5 refs, reporting a 22%, 26% or 62% increase risk of death)
- High blood pressure (3 refs)
- Strokes and heart attacks (3 refs)
- Type 2 diabetes (2 refs)
- Inflammatory bowel disease (2 refs)
- Cancers (10% increase for every 10% increase in UPF<sup>60</sup>)
- Fatty liver disease
- Depression
- Worse blood fat profile
- Frailty as measured by grip strength
- Irritable bowel syndrome and dyspepsia (25% increase)
- Dementia (10% increase in UPF corresponds to +25% dementia and +14% in Alzheimer's)

These references<sup>6</sup> are all to modern studies, many of which adjust for the amounts of sugar, fat, salt and fibre in the food, leaving the processing as the problem, rather than the nutrients<sup>p61</sup>.

Further work is likely to increase the number of diseases found to be associated with UPF. The graph on the right shows the number of papers published each year and indexed by <https://scholar.google.com> with "ultra processed food" in the title.

As can be seen from the number listed for the first half of 2023 (July), the total number of papers with UPF in the title for the whole year could be over 250. Some of the forthcoming papers might link UPF with other diseases, or perhaps with reports of reductions in height<sup>7</sup>, sperm counts<sup>8</sup>, female fertility<sup>9</sup>, sexual activity and desire<sup>10</sup>, IQ<sup>11</sup>, physical fitness<sup>12</sup>, or performance in some track and field sports<sup>13</sup>. It is difficult to imagine that this is not affecting the NHS, or our economy in general<sup>14</sup>; plus even our pets are suffering<sup>15</sup>.



6 None of the other papers found undermined the evidence that UPF is associated with poor health<sup>p66</sup>. Although one of the studies found failed to show a clear link with UPF<sup>p64</sup> all the other contra papers were written by authors with conflicts of interests, or sited evidence from such papers. This explains why the way we'd been thinking about food previously has shown no signs of solving the problem of diet related disease<sup>p35</sup>.

7 <https://ourworldindata.org/human-height?ref=cold-takes>

8 [https://www.fertstert.org/article/S0015-0282\(21\)02154-3/fulltext](https://www.fertstert.org/article/S0015-0282(21)02154-3/fulltext)

9 <https://www.nature.com/articles/s41574-021-00598-8>

10 <https://link.springer.com/article/10.1007/s10508-019-01525-9>

11 <https://www.sciencedirect.com/science/article/pii/S0160289623000156>

12 <https://bmjopensem.bmj.com/content/bmjosem/8/1/e001165.full.pdf>

13 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8185268/>

14 <https://commonslibrary.parliament.uk/how-is-health-affecting-economic-inactivity/>

15 <https://www.dvm360.com/view/vmx-2020-pet-obesity-today-challenges-and-solutions>

## 6 Possible Mechanisms

Chris's book and other sources have suggested the following reasons for the effects of UPF...

- High saturated fat, sugar, refined carbohydrates, and salt, leading to poor nutrition and health.
- Cheap, easily available, hyper palatable food, causing excess calorie consumption.
- High energy density, e.g. due to dryness, causing too many calories to be ingested before satiety mechanisms kick in.
- Excessive softness, making it too easy to overeat.
- Lack of the fibre that would normally limit the amount of food that can be eaten.
- The addictive nature of UPF, reinforced by marketing, leading to overconsumption.
- Excess fructose, plus other sugars and hyperglycaemic carbohydrates triggering the remains of a hibernation preparation mechanism inherited from our mammalian ancestors.
- Insufficient water and excess salt, triggering fat storage as a reserve against future dehydration.
- Lack of protein, leading to compensatory overeating according to the protein leverage hypothesis.
- The artificial flavour and texture of UPF, which prepares the consumer's metabolism to receive macronutrients which the food is not formulated to deliver.
- The refining out of micronutrients, leading to micronutrient deficiency and compensatory overeating.
- Emulsifiers, causing gut and cardio vascular inflammation<sup>16</sup>.
- Possible obesogens, either deliberately included as additives or inadvertently as contaminants<sup>17</sup>.
- Lack of nutritional variety leading to a poorer micro-biome and less healthy gut lining.
- Distracted eating, resulting in less appreciation of the food and more consumption at the next meal.

Since none of the possible mechanisms seem to exclude any of the others, there is every reason to think that the net effect of consuming UPF, may be the sum of many such effects. Indeed the UPF products which are most consumed may be the ones which are best at defeating the regulatory mechanisms in their consumers.

---

16 Food additive emulsifiers and risk of cardiovascular disease <https://www.bmj.com/content/382/bmj-2023-076058>

17 [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4574766](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4574766)



## 7 Limitations

In spite of the increasing amount of evidence on the effects of UPF, its definition is fuzzy, which makes it difficult to decide whether some foods are UPF or not. In addition, it is not clear that all UPF foods are bad, or that all whole foods are good.

The situation can be described in the diagram on the right. Here the circle represents potential foods. The 40% on the left represent potential whole foods, the 60% on the right, potential Ultra Processed Foods. The doughnuts represent actual foods, with the greener ones being healthier, the red ones more unhealthy.

The first problem is that the line separating potential UPF and whole foods is fuzzy, making it difficult to categorise those foods near the boundary. The second problem is that each existing food within these classifications has its own characteristics, raising the possibility that some UPF foods might be more healthy than some whole foods.

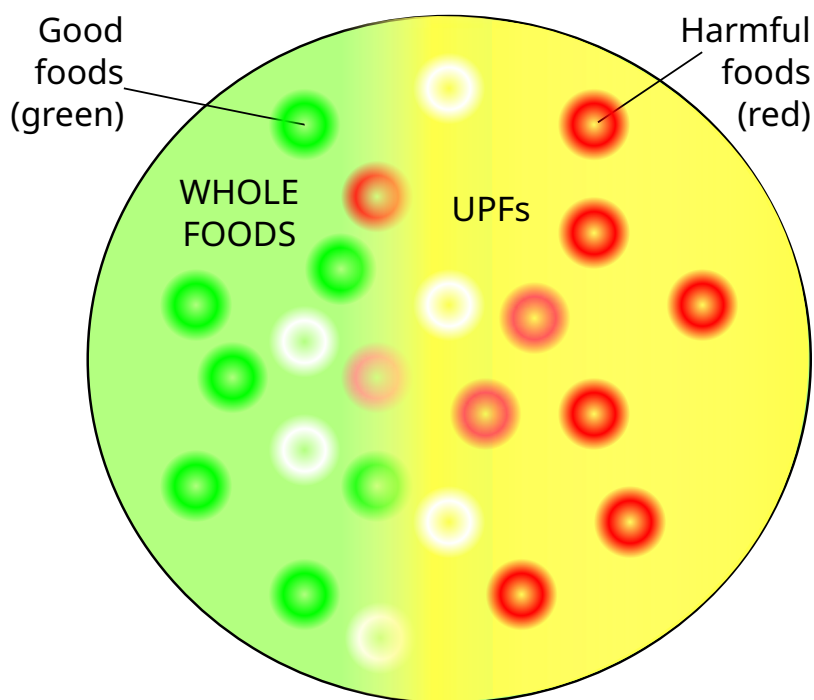
From point of view of anybody considering whether to move towards a whole food diet however, what matters is that a diet chosen from whole foods is more healthy than one made up of UPF, and that there is an easy way to distinguish between the two types. Fortunately, both seem to be true. At least for people getting a reasonably adequate diet, the effect of UPF seems to override the effect of individual nutrients.

## 8 Level of Acceptance

The use of processing-based messages in consumer-directed advice has been increasing over the last decade. A survey of 106 national guidelines published in 2020 or earlier, showed that the number cautioning against at least one type of processing had increased to 48, while 80 expressed preference for at least one type of minimal processing<sup>18</sup>

However, the US and most European governments have so far been resistant to advising their populations against eating UPF. For instance, the “Nordic Nutrition Recommendations<sup>19</sup>” concluded that ...

Despite the observed association between ultra-processed foods as a category and health outcomes, the NNR2023 Committee decided not to formulate any specific recommendations on ultra-processed foods.



18 [https://www.ijhpm.com/article\\_4197\\_5c4f5865deeba06d449e9c9d745d9c24.pdf](https://www.ijhpm.com/article_4197_5c4f5865deeba06d449e9c9d745d9c24.pdf)

19 <https://pub.norden.org/nord2023-003/nord2023-003.pdf>

... and the recent UK government “Scientific Advisory Committee on Nutrition” (SACN) report<sup>20</sup> concluded ...

...the limitations in the NOVA classification system, the potential for confounding, and the possibility that the observed adverse associations with (ultra-) processed foods are covered by existing UK dietary recommendations mean that the evidence to date needs to be treated with caution.

However, I could not find mentioned in the SACN report, any indication that the committee considered ...

1. The evidence that non-communicable diseases had increased in ways not adequately explained by causes other than UPF.
2. Whether people are right to assume that there are incentives for manufacturers to increase consumption of UPF by advertising and formulating their products to be over-consumed.
3. Whether UPF re-formulation and advertising has caused consumers to increase overall consumption, rather than merely switching products.
4. The biochemical and epidemiological evidence against some of the individual constituents and characteristics of process foods.

This makes the report rather like a trial verdict where the judge refused to accept any evidence that 1.) a murder had been committed, or 2.) that the accused had a motive, or 3.4.) even to consider the actions of the accused. The conclusion that the smoking gun could be explained in other ways is neither surprising or sound !

In contrast, Brazil’s dietary guidelines have a chapter headed<sup>21</sup> ...

“Avoid ultra-processed foods”

... while Israel’s says<sup>22</sup> ...

“PREFER PREPARING FOOD AT HOME FROM RAW INGREDIENTS RATHER THAN READY-MADE OR ULTRA-PROCESSED FOOD”

... Malaysia’s say<sup>23</sup>

“Limit intake of processed and ultra-processed foods”

... and Canada’s<sup>24</sup>

“Limit highly processed foods”

My guess is that it is still in the interests of many Governments to continue suffering the health and economic costs of UPF, rather than loose votes by acknowledging that they have let our food supply get into such a state. Other parties may not be willing to lose campaign donations by upsetting the large food corporations. However, the pressure for change is likely to increase until it is irresistible.

Meanwhile, people aware of how their diet’s are being manipulated in favour of company profits are free to make their own decisions.

20 <https://www.gov.uk/government/publications/sacn-statement-on-processed-foods-and-health>

21 [http://189.28.128.100/dab/docs/portaldab/publicacoes/guia\\_alimentar\\_populacao\\_ingles.pdf](http://189.28.128.100/dab/docs/portaldab/publicacoes/guia_alimentar_populacao_ingles.pdf)

22 <https://efsharibari.health.gov.il/media/1906/nutritional-recommendations-2020.pdf>

23 <http://irep.iium.edu.my/95741/6/MDG%202020%20%28KM1%20Pg26-41%29.pdf>

24 <https://food-guide.canada.ca/sites/default/files/artifact-pdf/CDG-EN-2018.pdf>