The cost of convenience: potential linkages between noncommunicable diseases and meal delivery apps

Afton Halloran,[a,b,c] Minah Faiz,[a] Saion Chatterjee,[a] Isabelle Clough,[a] Holly Rippin,[a] Clare Farrand,[a] Nuwan Weerasinghe,[a,d] Roberto Flore,[e] Hannah Springhorn,[f] João Breda,[g] Alison Tedstone,[h] and Kremlin Wickramasinghe[a,*]

[a]World Health Organization European Office for the Prevention and Control of Noncommunicable Diseases, Moscow, Russian Federation
[b]Department of Nutrition, Exercise and Sports, Faculty of Science, University of Copenhagen, Denmark
[c]GLOBE Institute, Center for Macroecology, Evolution and Climate, Faculty of Health and Medical Sciences, University of Copenhagen, Denmark
[d]Digital Information Research Centre (DIRC), Kingston University London, United Kingdom
[e]SkyLab FoodLab, Technical University of Denmark, Denmark
[f]Bloomberg School of Public Health, Johns Hopkins University, USA
[g]Division of Country Health Policies and Systems, World Health Organization, Greece
[h]Office of Health Improvement and Disparities, Department of Health and Social Care, United Kingdom

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Meal delivery (MD) apps are increasingly growing in popularity, shifting the way in which people access food and beverages outside their home. MD apps are a part of the wider digital food environment (i.e., the online settings where the flow of services and information influence food and nutritional choices and behaviour) and provide access to not only meals but also snacks and alcoholic beverages.[1] MD apps also represent an extension of the physical food environment and have received relatively little attention to date, warranting due scrutiny of public health and nutritional implications.

Currently, MD apps can be divided into two key segments. The most common segment provides a platform-to-consumer model that aggregates multiple food outlets, relying on third-party applications to deliver multiple options. The other segment involves large restaurant chains and prominent franchises with their own apps.

Frequent consumption of food from the out-of-home (OOH) sector has been linked with poor diet quality that combines larger portion sizes with high levels of energy, total fat, sodium and sugar compared to their retail counterparts.[2] Research shows that when an individual purchases food in the OOH sector they consume, on average, 200 more calories per day than if they eat food prepared at home.[3] This leads to negative health impacts such as overweight and obesity, well-known risk factors for several noncommunicable diseases (NCDs).

A cross-sectional analysis in 2020 revealed that the majority of popular menu items on MD apps were classified as 'discretionary', achieving a relatively low Food Environment Score (FES) (a characterisation of the availability of healthy/unhealthy foods in food environments).[4] Approximately 75% of the most popular food outlets on selected MD apps had a FES low enough to be classified as unhealthy. Studies have also demonstrated the disruption of food environments by increasing the geographic delivery distance of restaurants.[4,5]

MD apps collect significant amounts of user data for targeted offline and online advertising.[5,6] Studies have found that many advertisements upsell 'unhealthy' options as they are more likely to be classified as "most popular" on MD apps.[5,7] A preliminary study on digital food marketing in Norway found that 23% of food and beverage advertisements directed towards children were from food delivery services.[8] The majority of advertisements in the study promoted products that were unhealthy according to the WHO Europe Nutrient Profile Model and were not permitted to be marketed to children. Conversely, there is potential for food delivery companies to modulate their algorithms to promote healthier options if the right incentives are in place. However, knowledge about how these algorithms are developed is not publically available.

Few governments have implemented policies attempting to regulate food and beverage choice on MD apps. In 2022, the UK government will mandate restaurant chains to display the calorie information of non-prepacked food and drink items prepared for immediate consumption, including menus on MD apps.[9] Systematic reviews provide strong evidence that calorie labelling can help consumers reduce their calorie intake when eating out, especially when provided with contextual information such as recommended daily caloric intake.[10] However, research on nutritional labelling on MD apps is still anecdotal and requires further attention. Furthermore, calorie count alone is not a sufficient indicator of the complete nutritional composition required to make an informed healthier choice. While nutritional labelling on MD apps may not itself be

*Corresponding author.
E-mail address: wickramasinghek@who.int (K. Wickramasinghe).

- Adapt and apply existing laws promoting healthy diets to digital food environments.
- Implement mechanisms to monitor the influence of marketing on MD apps on public health (e.g. WHO NCDs Office's CLICK Framework investigating children's exposure to unhealthy digital food marketing).
- Use artificial intelligence and machine learning to collect, clean and analyse large amounts of data from MD apps and develop standardised databases accessible to public health authorities.
- Communicate clear and coherent public health messages in digital food environments and inform consumers of the adverse impacts of MD apps on unhealthy food choices.
- Incentivise restaurants to reformulate popular food items by reducing sugar, saturated fat and salt content.
- Conduct robust research to strengthen the causal relationship between nutritional composition and quality of food available on MD apps on nutritional status and overall health.
- Promote multisector and international/regional collaboration to implement effective strategies at a national and regional level.

***Box 1*: Recommendations for a multisector and systemic approach to MD apps.**

enough to incentivise healthy behaviour change, it can play a role to catalyse the development of consistent and cohesive evidence-based guidelines and policy to improve the digital food environment.

In many counties, existing government policies promoting healthy diets, such as nutrition labelling and marketing restrictions, may not yet apply to MD apps. The layered complexity of the nutritional impact of food delivered via MD apps warrants a multisector and systemic approach (Box 1).

Declaration of interests

The authors declare that they have no competing interests for the content of this paper. The authors alone are responsible for the views expressed in this article and they do not necessarily represent the views, decisions, or policies of the institutions with which they are affiliated.

Author contributions

All authors contributed to conceptualisation and writing (original draft and review and editing). KW is the Acting Head, WHO European Office for the Prevention and Control of Noncommunicable Diseases (WHO NCDs Office). CF is a technical officer, HR, AH, BC, SC, NW and MF are consultants of the same office. AH is also a postdoctoral researcher at the University of Copenhagen. NW is a researcher at Kingston University. RF is the Head of the DTU SkyLab FoodLab. HS is a MSPH student from Johns Hopkins University and carrying out her practicum at the WHO NCDs Office. AT is the Deputy Director Diet, Obesity and Physical Activity/Chief Nutritionist, Office of Health Improvement and Disparities, Department of Health and Social Care, UK Government.

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