

Comparing McDonald's food marketing practices on official Instagram accounts across 15 countries

Omni Cassidy ¹, Hye Won Shin,² Edmund Song,² Everett Jiang,² Ravindra Harri,² Catherine Cano,² Rajesh Vedanthan ¹, Gbenga Ogedegbe,¹ Marie Bragg^{1,2}

To cite: Cassidy O, Shin HW, Song E, *et al*. Comparing McDonald's food marketing practices on official Instagram accounts across 15 countries. *BMJ Nutrition, Prevention & Health* 2021;0:e000229. doi:10.1136/bmjnp-2021-000229

► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/bmjnp-2021-000229>).

¹Department of Population Health, NYU Langone Health, New York, New York, USA

²Department of Public Health Nutrition, New York University School of Global Public Health, New York, New York, USA

Correspondence to

Dr Omni Cassidy, NYU Langone Health, New York, New York, USA; omni.cassidy@nyulangone.org

Received 29 March 2021
Accepted 29 June 2021



© Author(s) (or their employer(s)) 2021. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

ABSTRACT

Background Social media advertising by fast food companies continues to increase globally, and exposure to food advertising contributes to poor diet and negative health outcomes (eg, cardiovascular disease). McDonald's—the largest fast food company in the world—operates in 101 countries, but little is known about their marketing techniques in various regions. The objective of this study was to compare the social media advertising practices of McDonald's—the largest fast food company in the world—in 15 high-income, upper-middle-income and lower-middle-income countries.

Methods We randomly selected official McDonald's Instagram accounts for 15 high-income, upper-middle-income and lower-middle-income countries. We captured all the screenshots that McDonald's posted on those Instagram accounts from September to December 2019. We quantified the number of followers, 'likes', 'comments' and video views associated with each account in April 2020. We used content analysis to examine differences in the marketing techniques.

Results The 15 accounts collectively maintained 10 million followers and generated 3.9 million 'likes', 164 816 comments and 38.2 million video views. We identified 849 posts. The three lower-middle-income countries had more posts (n=324; M, SD=108.0, 38.2 posts) than the five upper-middle-income countries (n=227; M, SD=45.4, 37.5 posts) and seven high-income countries (n=298; M, SD=42.6, 28.2 posts). Approximately 12% of the posts in high-income countries included child-targeted themes compared with 22% in lower-middle-income countries. Fourteen per cent of the posts in high-income countries included price promotions and free giveaways compared with 40% in lower-middle-income countries.

Conclusions Social media advertising has enabled McDonald's to reach millions of consumers in lower-middle-income and upper-middle-income countries with disproportionately greater child-targeted ads and price promotions in lower-middle-income countries. Such reach is concerning because of the increased risk of diet-related illnesses, including cardiovascular disease, in these regions.

INTRODUCTION

Poor diet is the leading cause of mortality worldwide,^{1 2} and places individuals at risk for

What this paper adds

- McDonald's posts 154% more posts in lower-middle-income countries compared to higher-income countries.
- McDonald's uses more child-targeted marketing themes in lower-middle-income countries compared to higher-income countries.
- McDonald's uses more health promotion themes in higher-income countries compared to lower-middle- and upper-middle-income countries.

obesity and non-communicable diseases, such as type 2 diabetes, cardiovascular disease and certain cancers.^{2 3} Although several factors influence diet, fast food has been linked to poor diet and obesity because of its calorically dense, nutritionally poor quality.⁴⁻⁶ More than 30% of US youth consume fast food daily,⁷ and fast food restaurant chains have rapidly increased their global presence, particularly in lower-income countries.⁸ McDonald's is the largest fast food company in the world with more than 14 000 restaurants in the US and nearly 22 000 restaurants in other countries.⁹ Given fast food's impact on nutrition and negative health outcomes,⁴ the growth of fast food companies' internationally, especially in lower-income countries, may exacerbate the double healthcare and economic burden of communicable and non-communicable diseases.^{1 10}

Although the relationship between the growth of fast food companies internationally and the individual demand for fast food is complex, fast food advertisements ('ads') play an influential role in persuading individuals to consume fast foods.¹¹ Food and beverage ads are ubiquitous on television and in outdoor settings, but social media ads are an emerging area of concern.¹² Instagram is one of the most popular social media platforms in the world,¹³ and allows fast food companies to advertise products through posting images

and videos, and engaging with their followers through accompanying captions and comments. Currently, 60% of the world's population uses the internet and 50% of the users are active on social media.¹⁴ According to one growth projection, nearly 60% of global internet users were using social media in January 2020, which equates to over 3.8 billion social media users.¹⁵ In an online study surveying over 15 000 adults from the US, the UK, Canada, Mexico and Australia, 64% of participants reported exposure to sugary drink marketing through online ads or social media.¹⁶ Fast food companies that advertise on social media, therefore, are capable of increasing their market to people around the world who regularly access social media.

Data increasingly show that the majority of food and beverage ads on social media are for unhealthy foods and beverages.^{17–19} In one study examining social media food and beverage ads in Australia, all of the foods advertised on Facebook pages managed by the food and beverage brands were for energy-dense, nutritionally poor foods.¹⁷ Another study showed that 77% of the social media ads Canadian adolescents viewed within a 5-minute period were for unhealthy food and beverage ads, and 97% of these foods were considered high in fat, sugar and salt.¹⁸ Exposure to these types of ads may contribute to food preferences and consumption that may precipitate poor diet and adverse health outcomes in these communities.¹¹

One of largest qualitative analyses of fast food ads across different countries examined 16 food and beverage company websites in Germany and the US (high-income countries (HICs)), China and Mexico (upper-middle-income countries (UMICs)) and India and the Philippines (lower-middle-income countries (LMICs)).²⁰ Results suggested that fast food companies advertised more healthy products in wealthier countries compared with lower-income countries, demonstrating segmentation in their advertising techniques across countries.²⁰ That study also found that food and beverage companies promoted more philanthropic activities in lower-income countries compared with wealthier countries.²⁰ Another content analysis examining 2 000 social media posts in the US demonstrated that 30% of posts included captions that attempted to interact directly with social media users.¹⁹ Little is known, however, about the marketing techniques of a single food company in countries with varying economic statuses.

To determine if there are differences in the marketing techniques across multiple countries of varying economic statuses, the objective of this study was to compare Instagram posts for McDonald's, the largest global fast food franchise,¹³ in a subset of 15 countries of varying gross domestic products (GDPs) and: (1) determine the number of followers, 'likes', comments, posts, video posts and total views of videos and (2) quantify the frequency with which McDonald's uses different marketing strategies.

METHODS

We identified a sample of 15 countries based on three criteria: (1) if McDonald's was sold in the country; (2) if the country had an official McDonald's Instagram page and (3) if the country could be categorised as an HIC, UMIC or LMIC based on 2019 World Bank classifications.²¹ We chose McDonald's because it is the largest global fast food chain,¹³ and selected Instagram because it is one of the most popular social media platforms for adolescents and young adults with approximately one billion active users per month.^{22 23}

Data collection

We collected data from September 2019 to April 2020, and the Instagram posts were gathered from September to December 2019. We used McDonald's corporate website to generate a list of all the countries with McDonald's fast food chains (see [figure 1](#) for flow chart). We then made a list of all official McDonald's Instagram accounts for each of the countries. To determine if the Instagram account was officially associated with McDonald's, we confirmed the presence of a 'verification badge' on the Instagram profile. A verification badge is a blue checkmark logo that appears next to the account's name that signifies that Instagram has confirmed the account is associated with a celebrity, public figure or global brand. McDonald's only had one official account for most of the countries. If McDonald's had more than one official account for the country, we used the account with the most followers. From this list, we selected a subset of 15 countries, ensuring that at least one country was represented in each of the continents in which McDonald's operates. The country remained in the sample pool if it met the inclusion criteria. If a country did not meet the criteria, it was excluded, and another country was randomly selected. This process was repeated until all 15 countries met the criteria. We initially identified and selected countries based on GDP. On further reflection, we determined that classifications from the 2019 World Bank Database were more appropriate.²¹ We then grouped the countries into their respective economic categories based on the three classifications defined by the 2019 World Bank Database: HIC, UMIC and LMIC.²¹ We screen captured all posts on the official McDonald's Instagram accounts from 1 September 2019 to 31 December 2019. In April 2020, we recorded image type (image or video) and number of 'likes', comments and video views, if applicable.

Establishing the qualitative codebook

To evaluate the posts for their marketing content, we developed a qualitative codebook based on similar qualitative food marketing studies.^{19 24} The codebook (online supplemental appendix 1) included the following variables: (1) food and/or beverage shown; (2) celebrity/influencers/sponsorships; (3) healthy habits (eg, exchanging fries for apples); (4) child-targeted (eg, showing a picture of a child or adolescent); (5) special price promotions; (6) promote McDonald's app, website or McDelivery; (7) free

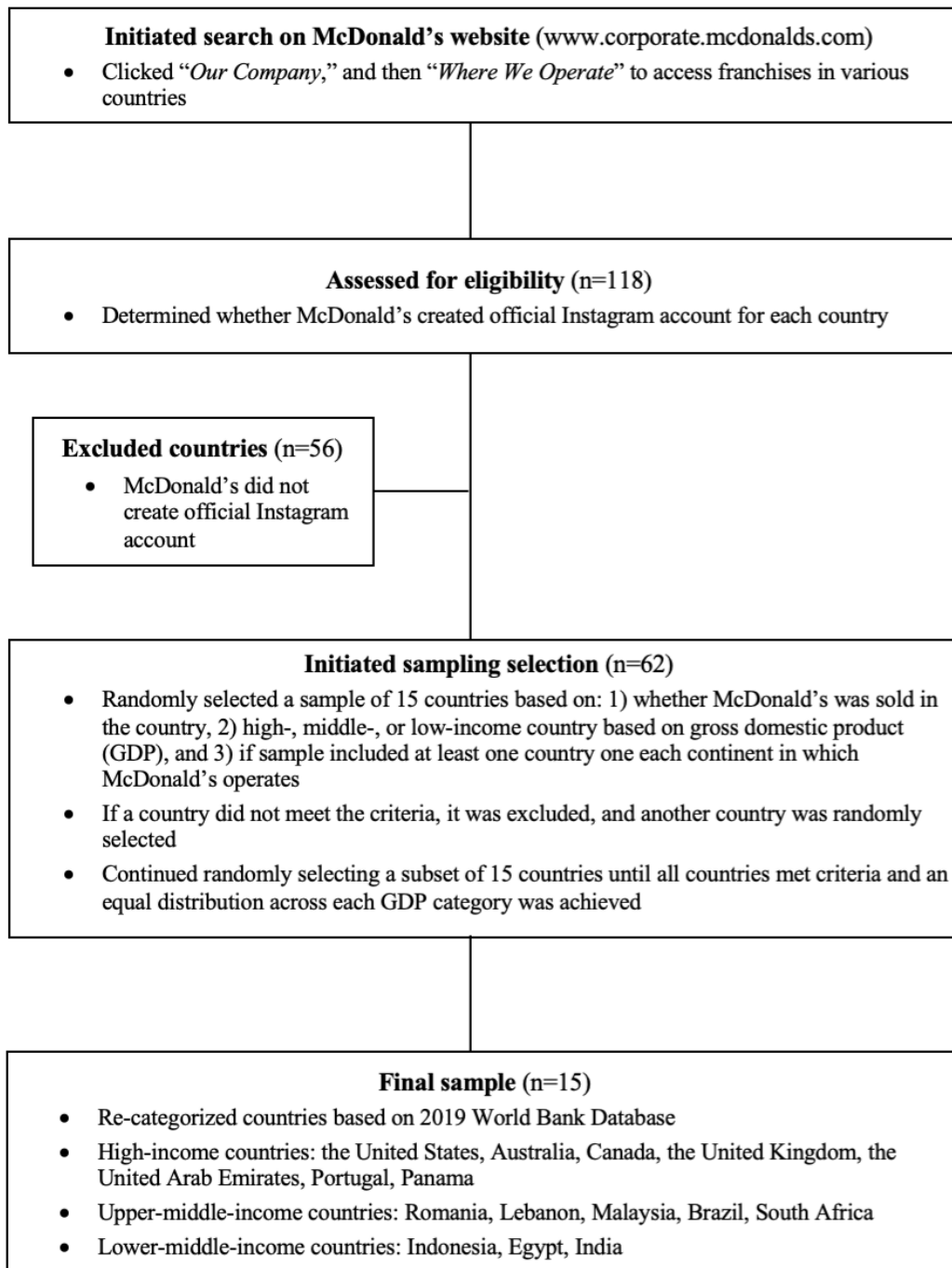


Figure 1 Flow chart of country selection.

giveaway/voucher; (8) culturally relevant (eg, religious symbols); (9) engagements (eg, encouragements to like, comment or read the bio); (10) philanthropy/charity; (11) emotional appeal; (12) new branch (ie, promoting a newly opened McDonald’s restaurant) and (13) humour (eg, memes). We discussed the definition of each codebook category to ensure consistency among coders. The definition of each marketing technique is summarised in [table 1](#).

Pilot coding

Pilot coding was conducted to establish interrater reliability using 10% of the posts. An acceptable level of reliability was determined by at least a 90.0% agreement or Krippendorff alpha coefficient of 0.70 or above.²⁵ Five coders were initially trained on the codebook and participated in the pilot coding. However, only two coders achieved a Krippendorff alpha coefficient of at least 0.70 or 90.0% agreement for all variables, and they coded the

Table 1 Definition of the marketing techniques

Marketing technique	Definition
Food and/or beverage shown	Any visual food or beverage item. (For food, this does not include packaging. For beverage, this can include beverage cups as long as the post does not clearly show that the cup is empty. Background menu with images of food/beverage does not apply to this category as well as animated food/beverage unless it is part of the concept of the post)
Celebrity/influencer/sponsorships	Includes a reference to the person or organisation (must have over 10K followers) on the post or is partnering with McDonald's
Healthy habits	Promotes healthy diet, exercise, conservation efforts, local farms, education or any other ideas that promote the well-being of the person or environment
Child-targeted	Shows a child, cartoons, Happy Meal, toys, characters (eg, from films) or any other child-related themes
Special price promotions	Discount offers, 2-for-1 deals, buy-one-get-free deals or any other reduced-price promotions
Promote McDonald's App, website or McDelivery	Promotes app, website or McDelivery in any way (eg, app store logo)
Free giveaway/voucher	Includes competitions with free prizes, free food offers and any other free giveaways that do not include purchasing another item
Culturally relevant	Includes holidays, famous monuments (has to be relevant to its country), religious symbols or any other reference to the country's culture
Engagement	Encourages to like, comment, read the bio or any other way to interact with the post
Philanthropy/charity	Undertakes any charitable work
Emotional appeal	Evokes emotional reaction (eg, happiness) or allows to reminiscence
New branch	Markets a new regional McDonald's that has opened
Humour	Any post that attempts to use comic marketing (eg, memes, jokes, comic actions)

remaining 90% of the data. The codes for the remaining three coders were discarded. Because the two coders rated the same sample of data, there were two potential sets of data. The final dataset was composed of half of each of the two coders' sets of data based on random selection. Some of the countries' Instagram accounts had posts that were not in English, so we used Google Translator in the Chrome extension to translate these posts into English.

Data analytical plan

We used R V.1.2.1578 to conduct descriptive analyses to calculate the number of followers, 'likes', comments, posts, video posts and video views associated with each McDonald's Instagram account. We also calculated the frequency that McDonald's used each marketing technique across the 15 countries.

Patient and public involvement

The project does not include human subjects and was exempt from human subjects ethics review committee. It was not appropriate or possible to involve patients or the public in the design, or conduct, or reporting, or dissemination plans of our research.

RESULTS

Descriptive characteristics

We identified McDonald's franchises in a total of 118 countries, and McDonald's had official Instagram accounts for 62 countries. Our subset of 15 countries (25% of all accounts) included: the US, Australia, Canada, the UK, United Arab Emirates (UAE), Portugal and Panama

(HICs); Romania, Lebanon, Malaysia, Brazil and South Africa (UMICs) and Indonesia, Egypt and India (LMICs). These countries collectively maintained 10 million followers, generated 3 883 952 'likes', 164 816 comments, and 38 247 012 video views, and posted 849 times during the 4-month data collection period (see [table 2](#)). The average numbers of followers were 2.1 million (LMICs; 0.9% of Instagram users), 3.5 million (UMICs; 2.0% of Instagram users) and 4.4 million (UICs; 1.5% of Instagram users; see [table 2](#)). The countries with the highest number of followers included the US (3.7 million; HIC), Brazil (2.6 million; UMIC) and Indonesia (1.1 million; LMIC).

We identified 153.7% more posts on average in LMICs compared with HICs. That is, we identified an average (SD) of 108.0 (38.2) posts in the LMICs as compared with 42.6 (28.2) posts in the HICs during the same time period.

Qualitative analysis of marketing strategies

Child-targeted marketing themes appeared more frequently in lower-income countries than HICs (see [figure 2](#)). The reverse was true for health promotion themes. We identified 71 (22.0%, see [table 3](#)) child-targeted posts in LMICs, but just 33 child-targeted posts (14.5%) in UMICs and 37 (12.4%) in HICs. The HICs' accounts also portrayed more healthy habits (n=14, 4.7%) compared with the UMICs' accounts (n=6, 2.6%) and LMICs' accounts (n=8, 2.5%).

Two forms of price-related themes—free giveaways and price promotions—appeared more frequently in LMICs'

Table 2 Characteristics of McDonald’s Instagram account by country for the third quartile of 2019

Income category	Country	Total Instagram users (n)*	McDonald’s Instagram followers (n)	Posts during study period (n)	Average likes per post (n)	Average comments per post (n)	Total videos (n)	Average views per video (n)
High	US	120M	3.7M	14	19 095	650	5	160 447
	Australia	9.7M	155K	85	1192	37	20	7317
	Canada	13M	117K	63	1003	51	18	22 195
	UK	24M	180K	16	3615	136	1	42 293
	UAE	3.8M	74.7K	43	881	44	30	17 516
	Portugal	3.8M	118K	16	9334	59	0	–
	Panama	1.6M	267K	61	476	14	26	6064
Subtotals†		175.9M	4.4M	298	5085	141	100	42 638
Average (SD)†		44.0M (66.3M)	659K (1.3M)	43 (28)	2373 (4808)	71 (170)	25 (32)	20 735 (44 329)
Upper-middle	Romania	3.7M	44.6K	45	2070	14	0	–
	Lebanon	1.6M	121K	108	2910	178	12	18 715
	Malaysia	12M	475K	18	2234	56	5	33 796
	Brazil	77M	2.6M	41	35 258	1343	30	879 954
	South Africa	4M	46.4K	15	534	10	2	5100
Subtotals†		98.3M	3.5M	227	8601	320	49	234 391
Average (SD)†		32.8M (43.2M)	657K (1.1M)	45 (37)	8376 (28 741)	340 (1072)	16 (19)	529 989 (952 071)
Lower-middle	Indonesia	63M	1.1M	152	5480	248	58	71 218
	Egypt	11M	847K	88	3331	115	49	94 640
	India	80M	180K	84	1805	223	41	9172
Subtotals†		154M	2.1M	324	3538*	195*	148	91 676*
Average (SD)†		77.0M (59.1M)	709K (475K)	108 (38)	3944 (6195)	205 (408)	74 (50)	61 784 (192 219)
Grand total		1.1B	10M	849	5741*	219*	297	122 902*

*Data available from: Digital 2020: Global Digital Overview (Internet).¹⁵ Smart Insights and Hootsuite.¹⁴ 2020 (cited 30 June 2020). Available from: <https://datareportal.com/reports/digital-2020-global-digital-overview>.

†Averages rounded down to whole numbers to improve interpretation.

UAE, United Arab Emirates.

accounts compared with HICs’ accounts. Free giveaways were offered the most on LMICs’ accounts (n=70, 21.6%) compared with the UMICs’ accounts (n=23, 10.1%) and HICs’ accounts (n=18, 6.0%). LMICs’ accounts promoted the most special price promotions (n=59, 18.2%) compared with the UMICs’ accounts (n=30, 13.2%) and the HICs’ accounts (n=25, 8.4%).

Nearly a quarter of all posts included culturally relevant themes, and engagement tools appeared more frequently in LMICs than HICs (see figure 2). McDonald’s promoted the opening of a new restaurant more frequently in LMICs’ accounts (n=13, 4.0%) than UMICs’ accounts (n=2, 0.9%) and HICs’ accounts (n=0, 0.0%; see figure 2). After rating each country, there were several notable marketing techniques that were unique to one or a small number of countries. For example, 71.4% (n=5) of posts with the healthy habit theme appeared alongside free books and Happy Meals in Indonesia’s account and 50.0% (n=3) in Lebanon’s account. Australia’s account was the only one in the sample that recognised or expressed gratitude to employees and promoted using locally grown produce. Additionally, 93.3% of South Africa’s posts included a celebrity endorsement (n=14; see

table 3). We also observed country-specific marketing techniques for sports, religion and culture. The Instagram account from Canada, for example, featured the Raptors, a professional basketball team from Toronto. Australia’s account referenced ‘100% Aussie’, and the McDonald’s account for India posted nine images celebrating Diwali, Dussehra and Onam, whereas the account for the UAE and Lebanon depicted Eid and Halal-certified food.

DISCUSSION

Fast food consumption is one factor influencing poor diet that may precipitate obesity and diet-related chronic illnesses.⁴ Exposure to fast food ads through social media may place vulnerable groups—particularly those in lower-income countries—at increased risk for obesity and diet-related chronic conditions.^{1 26} This study examined the social media food marketing strategies of McDonald’s, the largest fast food franchise in the world, on Instagram accounts in a subset of 15 countries of varying economic categories. Overall, there were more McDonald’s Instagram posts, on average, on LMICs’ accounts compared with HICs’ accounts, but the data must be interpreted

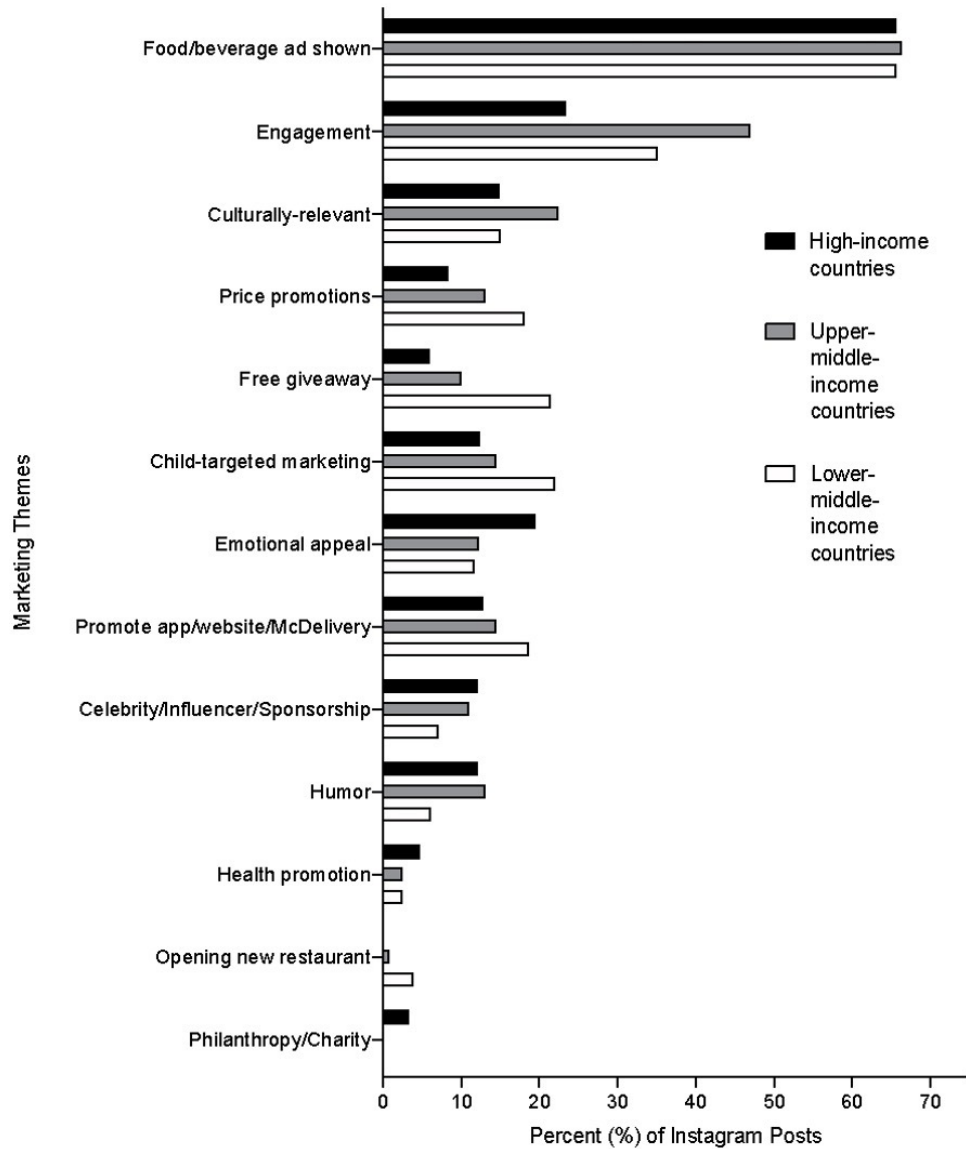


Figure 2 Food and beverage advertisements ('ads') shown and marketing strategies used by McDonald's on Instagram by economic classification for the third quartile of 2019.

cautiously given the uneven sampling. Data also showed that McDonald's offered more special price promotions and free giveaway/vouchers on accounts in LMICs compared with UMIC and HICs, suggesting that McDonald's may be using value price promotions as a marketing technique more in LMICs compared with HICs. Price is a key component of a marketing mix and is often used to aid consumer purchases, particularly among lower-income communities who may use price as a decision point.²⁷ Although no study has directly examined price promotion marketing techniques on social media in different countries of varying economic categories, these findings are consistent with studies demonstrating the disproportionate amount of price promotion offers with food and/or beverages in lower-income areas.²⁷⁻²⁹

More McDonald's Instagram accounts in LMICs used child-targeted marketing techniques compared with the accounts in UMICs and HICs. Studies have found that many

food and beverage companies promote unhealthy food and beverage products on social media using child-targeted marketing,^{18 30} influencing brand loyalty at a young age.³¹ One study has shown the powerful persuasive effect of using food companies' brand characters to market to children.³² Other studies have shown that fast food companies disproportionately target children and young adolescents³³ and more often use child-directed marketing in middle-income neighbourhoods compared with high-income neighbourhoods.³⁴ Although interpretation is limited due to our sample size and uneven sampling distributions, our findings will add to the growing literature because it highlights the possible relationship between child-targeted marketing techniques on social media and lower-income countries.

This study showed that McDonald's used celebrity/influencers/sponsorships endorsements more on Instagram accounts in HICs and UMICs compared with LMICs. The persuasive effect of celebrity and influencer endorsements

Table 3 Marketing strategies used by McDonald's on Instagram for each country for the third quartile of 2019

Income category	Country	Food/ beverage shown n (%)	Celebrity n (%)	Health n (%)	Child n (%)	Price n (%)	App/ web n (%)	Give n (%)	Culture n (%)	Engage n (%)	Charity n (%)	Emotion n (%)	Branch n (%)	Humour n (%)
High	USA	10 (71.4)	5 (35.7)	0 (0.0)	0 (0.0)	0 (0.0)	2 (14.3)	0 (0.0)	2 (14.3)	1 (7.1)	1 (7.1)	1 (7.1)	0 (0.0)	1 (7.1)
	Australia	43 (50.1)	10 (11.8)	11 (13.0)	13 (15.3)	3 (3.5)	5 (5.9)	0 (0.0)	4 (4.7)	20 (23.5)	9 (10.6)	32 (37.6)	0 (0.0)	12 (14.1)
	Canada	56 (88.9)	8 (12.7)	3 (4.8)	3 (4.8)	2 (3.2)	2 (3.2)	2 (3.2)	14 (22.2)	10 (15.9)	0 (0.0)	3 (4.8)	0 (0.0)	14 (22.2)
	UK	14 (87.5)	2 (12.5)	0 (0.0)	1 (6.3)	2 (12.5)	4 (25.0)	2 (12.5)	3 (18.8)	4 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (25.0)
	UAE	28 (65.1)	0 (0.0)	0 (0.0)	6 (14.0)	7 (16.3)	21 (48.8)	14 (32.6)	5 (11.6)	10 (23.3)	0 (0.0)	8 (18.6)	0 (0.0)	1 (2.3)
Upper-middle	Portugal	13 (81.3)	0 (0.0)	0 (0.0)	1 (6.3)	8 (50.0)	1 (6.3)	0 (0.0)	1 (6.3)	7 (43.8)	0 (0.0)	5 (31.3)	0 (0.0)	4 (25.0)
	Panama	32 (52.5)	11 (18.0)	0 (0.0)	13 (21.3)	3 (4.9)	3 (4.9)	0 (0.0)	16 (26.2)	18 (29.5)	0 (0.0)	9 (14.8)	0 (0.0)	0 (0.0)
	Romania	22 (48.9)	1 (2.2)	0 (0.0)	8 (17.8)	0 (0.0)	6 (13.3)	2 (4.4)	12 (26.7)	23 (51.1)	1 (2.2)	6 (13.3)	0 (0.0)	0 (0.0)
	Lebanon	74 (68.5)	1 (0.9)	6 (5.6)	13 (12.0)	18 (16.7)	16 (14.8)	21 (19.4)	35 (32.4)	76 (70.4)	1 (0.9)	18 (16.7)	0 (0.0)	12 (11.1)
	Malaysia	16 (88.9)	0 (0.0)	0 (0.0)	1 (5.6)	8 (44.4)	2 (11.1)	0 (0.0)	1 (5.6)	2 (11.1)	0 (0.0)	0 (0.0)	0 (0.0)	4 (22.2)
Lower middle	Brazil	35 (85.4)	9 (22.0)	0 (0.0)	11 (26.8)	4 (9.8)	9 (22.0)	0 (0.0)	3 (7.3)	5 (12.2)	1 (2.4)	1 (2.4)	2 (4.9)	14 (34.1)
	South Africa	4 (26.7)	14 (93.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (6.7)	0 (0.0)	3 (20.0)	0 (0.0)	0 (0.0)
	Indonesia	100 (65.8)	0 (0.0)	7 (4.6)	42 (27.6)	41 (27.0)	21 (13.8)	33 (21.2)	10 (6.6)	68 (44.7)	3 (2.0)	28 (18.4)	8 (5.3)	3 (2.0)
	Egypt	61 (69.3)	5 (5.7)	0 (0.0)	15 (17.0)	6 (6.8)	21 (23.4)	15 (17.0)	23 (26.1)	9 (10.2)	0 (0.0)	8 (9.1)	5 (5.7)	3 (3.4)
	India	52 (61.9)	18 (21.4)	1 (1.2)	14 (16.7)	12 (14.3)	19 (22.6)	22 (26.2)	16 (19.1)	37 (44.0)	1 (1.2)	2 (2.4)	0 (0.0)	14 (16.7)
Totals		560 (66.0)	84 (9.9)	28 (3.3)	141 (16.6)	114 (13.4)	132 (15.5)	111 (13.1)	145 (17.1)	291 (34.3)	17 (2.0)	124 (14.6)	15 (1.8)	86 (10.1)

App/web, promote McDonald's app, website or McDelivery; Branch, new branch opening; Celebrity, celebrity/influencers/sponsorships; Charity, philanthropy/charity; Child, child-targeted; Culture, culturally relevant; Emotion, emotional appeal; Engage, engagements; Give, free giveaway/voucher; Health, healthy habits; Price, special price promotion; UAE, United Arab Emirates.

on food marketing has been demonstrated in many studies.^{35–37} Celebrity and influencer endorsements may lead to consumers recognising brands more easily, viewing brands more positively, and increasing the desirability of endorsed brands.^{35–37} Social media influencers who endorse unhealthy foods, in particular, may also lead to higher consumption of unhealthy foods among youth compared with influencers who endorse non-food products.³⁶ The similarity of the usage of celebrity endorsement between the HICs' accounts and the UMICs' accounts could be attributed to the relatively high use of celebrity endorsement by South Africa's account, a UMIC. Therefore, a more thorough understanding of the celebrity endorsement technique could be obtained with a larger sample size.

McDonald's Instagram accounts in HICs featured more healthy habits themes compared with accounts in UMICs and LMICs. This finding is consistent with a similar study by Bragg *et al* that suggests HICs' websites promote healthier food alternatives compared with LMICs.²⁰ However, our definition of healthy habits included many different aspects of well-being (table 1), which may prevent direct comparison. Further studies are needed to more thoroughly assess the healthy habits category. For example, the healthy habits variable could be divided into four smaller variables: reference to healthy diet (eg, apples, salad), reference to exercise, promoting education, and promoting local produce.

Additional considerations when interpreting these data are that McDonald's may operate differently in various countries. For example, McDonald's operating in the UK has a different chain of command and operating structure than a McDonald's in the US.³⁸ It is also difficult to identify which department manages the social media campaigns and whether the social media is coordinated within the company or contracted to a social media marketing agency. In the US, the social media accounts are typically coordinated within a company; however, if accounts are contracted out in other countries, there may be additional variables to consider.³⁹ Other factors include whether the country's government tolerates Western culture, as well as freedom of media. In recent years, for instance, Lebanon has had a widespread government campaign to reduce social media accounts critical of the government.⁴⁰ These governmental differences may affect the data as McDonald's is seen as a Western symbol, which may not be tolerated in some regimes and governments. McDonald's may have to avert certain Western ideologies in order to comply with government regulations.

There were several limitations to our study. This study was limited to a subset of 15 countries, so the results must be interpreted with caution. We did not have an equal number of countries for each income category and countries have different population sizes, which may skew the results. However, we were still able to generate preliminary information that could be used in future studies. We also used Google Translate, so we might have incorrectly translated some posts. In addition, this study did not explore the individual-level factors of consumers—the personal characteristics of McDonald's Instagram followers in the various countries (eg, age, household income), purchasing

behaviours or consumption patterns resulting from following these McDonald's accounts. As previously noted, these and other factors are core to the complex relationship between consumer demand and food companies. It will be important for future food marketing studies to effectively examine this complexity. These data also do not provide information on additional factors that may influence personal social media use, including age or household income. Such data are typically proprietary and expensive to obtain. Still, this study has several strengths. It is the first to provide an exploratory analysis of Instagram usage by McDonald's, a single fast food company, in different countries of varying incomes. There are very few data examining the ways fast food companies may market products differently in other countries.

CONCLUSIONS

As the largest fast food franchise in the world, McDonald's provides fast food to communities around the globe. As social media use grows, fast food companies' social media ads may have unprecedented effects on dietary options, especially in lower-income countries.¹⁵ By targeting certain subsets through child-targeted ads and price promotions, McDonald's social media ads may exacerbate healthcare issues in the most vulnerable countries in the world.^{1 26} These data support the growing need to address the globalisation of food and beverage marketing in developing countries that may experience higher burdens of poor diet, obesity and related illnesses.^{1 26}

Contributors OC substantially contributed to the interpretation of data for the work, drafting and revising it critically for important intellectual content. HWS, ES, EJ, RH and CC substantially contributed to the acquisition and analysis for the work and drafting the work. RV and GO substantially contributed to the interpretation of data for the work and revising it critically for important intellectual content. MB substantially contributed to the conception and design of the work, interpretation of data for the work and revising it critically for important intellectual content. All authors approved the final version to be published and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Funding This study was partially supported by NIH grant, DP5OD021373-01 (MB) and AHRQ grant, 1T32HS026120-01 (OC).

Disclaimer The funding agencies did not have any role in the design, collection, analysis, or interpretation of data or in writing the manuscript.

Competing interests None declared.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on reasonable request.

Author note The authors wish to make it clear that so far as reference 11 is concerned, McDonald's was not one of the fast food companies that were specifically referred to in this article.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Omni Cassidy <http://orcid.org/0000-0002-1718-2387>

Rajesh Vedanthan <http://orcid.org/0000-0001-7138-2382>

REFERENCES

- 1 Afshin A, Sur PJ, Fay KA, *et al*. Health effects of dietary risks in 195 countries, 1990-2017: a systematic analysis for the global burden of disease study 2017. *Lancet* 2019;393:1958–72.
- 2 GBD 2013 Mortality and Causes of Death Collaborators. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the global burden of disease study 2013. *Lancet* 2015;385:117–71.
- 3 Simon and Schuster, Department of Health and Human Services, U.S. Department of Agriculture. Dietary guidelines for Americans 2015-2020; 2017.
- 4 Wolfson JA, Leung CW, Gearhardt AN. Trends in the nutrition profile of menu items at large burger chain restaurants. *Am J Prev Med* 2020;58:e171–9.
- 5 Fryar CD, Hughes JP, Herrick KA. Fast food consumption among adults in the United States, 2013-2016, 2018. Available: <https://stacks.cdc.gov/view/cdc/59582>
- 6 Mohammadbeigi A, Asgarian A, Moshir E, *et al*. Fast food consumption and overweight/obesity prevalence in students and its association with general and abdominal obesity. *J Prev Med Hyg* 2018;59:E236–40.
- 7 Vikraman S, Fryar CD, Ogden CL. Caloric intake from fast food among children and adolescents in the United States, 2011-2012. *NCHS Data Brief* 2015:1–8.
- 8 Hawkes C. Marketing activities of global soft drink and fast food companies in emerging markets: a review, 2002. Available: <https://www.scienceopen.com/document?vid=8ef0eb9f-dd31-4b3e-8e79-bf94aa14579d>
- 9 Daszkowski D. How American fast food franchises expanded abroad, 2012. The Balance Small Business. Available: <https://www.thebalancesmb.com/how-american-fast-food-franchises-expanded-abroad-1350955> [Accessed 22 Apr 2020].
- 10 Woetzel J, Dobbs R, Manyika J. Overcoming obesity: an initial economic analysis, 2014. Available: <https://www.scienceopen.com/document?vid=cfc125f6-4669-41d5-a349-c3231bf1b72b>
- 11 Smith R, Kelly B, Yeatman H, *et al*. Food marketing Influences children's attitudes, preferences and consumption: a systematic critical review. *Nutrients* 2019;11:875.
- 12 Gascon JFF, Rodriguez JR, Bernal PM. Social media use of fast food companies. *12th Iberian Conference on Information Systems and Technologies (CISTI)*, 2017.
- 13 McGrath M. The largest restaurant companies in the world 2018: McDonald's And Starbucks at top of food chain, 2018. Forbes Magazine. Available: <https://www.forbes.com/sites/maggiemcgrath/2018/06/06/the-largest-restaurant-companies-in-the-world-2018-mcdonalds-and-starbucks-at-top-of-food-chain/> [Accessed 22 Apr 2020].
- 14 Commentator BE. Global social media research summary 2020, 2020. Smart insights. Available: <https://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/> [Accessed 22 Apr 2020].
- 15 We Are Social. Digital 2020: 3.8 billion people use social media, 2020. Available: <https://wearesocial.com/blog/2020/01/digital-2020-3-8-billion-people-use-social-media> [Accessed 22 Apr 2020].
- 16 Kelly B, Vandevijvere S, Ng S, *et al*. Global benchmarking of children's exposure to television advertising of unhealthy foods and beverages across 22 countries. *Obes Rev* 2019;20 Suppl 2:116–28.
- 17 Freeman B, Kelly B, Baur L, *et al*. Digital junk: food and beverage marketing on Facebook. *Am J Public Health* 2014;104:e56–e64.
- 18 Potvin Kent M, Pauzé E, Roy E-A, *et al*. Children and adolescents' exposure to food and beverage marketing in social media apps. *Pediatr Obes* 2019;14:e12508.
- 19 Bragg MA, Pageot YK, Amico A, *et al*. Fast food, beverage, and snack brands on social media in the United States: an examination of marketing techniques utilized in 2000 brand posts. *Pediatr Obes* 2020;15:e12606.
- 20 Bragg MA, Eby M, Arshonsky J, *et al*. Comparison of online marketing techniques on food and beverage companies' websites in six countries. *Global Health* 2017;13:79.
- 21 World Bank Data Help Desk. World Bank country and lending groups. Available: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> [Accessed 22 Apr 2020].
- 22 Kellogg K. The 7 biggest social media sites in 2020. Available: <https://www.searchenginejournal.com/social-media/biggest-social-media-sites>
- 23 Perrin A, Anderson M. Share of US adults using social media, including Facebook, is mostly unchanged since 2018, 2019. Pew Research Center. Available: <https://www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/>
- 24 Vassallo AJ, Kelly B, Zhang L, *et al*. Junk food marketing on Instagram: content analysis. *JMIR Public Health Surveill* 2018;4:e54.
- 25 Lombard M, Snyder-Duch J, Bracken CC. Content analysis in mass communication: assessment and reporting of Inter-coder reliability. *Hum Commun Res* 2002;28:587–604.
- 26 Di Cesare M, Soric M, Bovet P, *et al*. The epidemiological burden of obesity in childhood: a worldwide epidemic requiring urgent action. *BMC Med* 2019;17:212.
- 27 Grier SA, Kumanyika SK. The context for choice: health implications of targeted food and beverage marketing to African Americans. *Am J Public Health* 2008;98:1616–29.
- 28 Basch CH, Ethan D, Rajan S. Price, promotion, and availability of nutrition information: a descriptive study of a popular fast food chain in New York City. *Glob J Health Sci* 2013;5:73–80.
- 29 Powell LM, Chiqui JF, Khan T, *et al*. Assessing the potential effectiveness of food and beverage taxes and subsidies for improving public health: a systematic review of prices, demand and body weight outcomes. *Obes Rev* 2013;14:110–28.
- 30 Fleming-Milici F, Harris JL. Adolescents' engagement with unhealthy food and beverage brands on social media. *Appetite* 2020;146:104501.
- 31 Story M, French S. Food advertising and marketing directed at children and adolescents in the US. *Int J Behav Nutr Phys Act* 2004;1:3.
- 32 Kraak VI, Story M. Influence of food companies' brand mascots and entertainment companies' cartoon media characters on children's diet and health: a systematic review and research needs. *Obes Rev* 2015;16:107–26.
- 33 Powell LM, Wada R, Kumanyika SK. Racial/ethnic and income disparities in child and adolescent exposure to food and beverage television ads across the U.S. media markets. *Health Place* 2014;29:124–31.
- 34 Ohri-Vachaspati P, Isgor Z, Rimkus L, *et al*. Child-directed marketing inside and on the exterior of fast food restaurants. *Am J Prev Med* 2015;48:22–30.
- 35 Bragg MA, Miller AN, Elizee J, *et al*. Popular music celebrity endorsements in food and nonalcoholic beverage marketing. *Pediatrics* 2016;138. doi:10.1542/peds.2015-3977. [Epub ahead of print: 6 June 2016].
- 36 Coates AE, Hardman CA, Halford JCG, *et al*. Social media influencer marketing and children's food intake: a randomized trial. *Pediatrics* 2019;143. doi:10.1542/peds.2018-2554. [Epub ahead of print: 4 March 2019].
- 37 Keel A, Nataraajan R. Celebrity endorsements and beyond: new avenues for celebrity branding. *Psychol Mark* 2012;29:690–703.
- 38 McDonald's U.S. Leadership Team: CEO & Executives. Available: <https://www.mcdonalds.com/us/en-us/about-us/leadership-team.html> [Accessed 22 Apr 2020].
- 39 How McDonald's handles thousands of social mentions per day. Content marketing consulting and social media strategy. Available: <https://www.convinceandconvert.com/podcasts/episodes/how-mcdonalds-handles-thousands-of-social-mentions-per-day/> [Accessed 22 Apr 2020].
- 40 Civicus. Arrests, office raids and internet restrictions as Lebanon continue crackdown on media freedom. Available: <https://monitor.civicus.org/updates/2019/08/13/Arrests-office-raids-and-internet-restrictions-as-Lebanon-continue-crackdown-on-media-freedom/> [Accessed 22 Apr 2020].