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Evaluation of Fast-Food Restaurant Kids' Meal Beverage Offerings 1 Year After a State-Level Healthy Beverage Default Policy

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Introduction: Ordering from kids' menus and children's restaurant consumption is associated with greater purchasing and intake, respectively, of sugar-sweetened beverages. In response, policymakers have enacted strategies to improve the healthfulness of kids' meal offerings. This study investigated restaurant kids' meal beverage offerings and compliance with an Illinois healthy beverage default act, effective from January 1, 2022.

Methods: Using a pre−post intervention (Illinois)−comparison (Wisconsin) site research design, fast-food restaurant audit data were collected before and 1 year after the Illinois Healthy Beverage Default Act from 6 platforms: restaurant interior and drive-thru menu boards and websites/applications and 3 third-party ordering platforms (DoorDash, Uber Eats, and Grubhub). Analyses included 62−110 restaurants across platforms. Difference-in-differences−weighted logistic regression models with robust SEs, clustered on restaurants, were estimated to assess pre to 1-year postpolicy changes in overall compliance for each audit setting in Illinois relative to that in Wisconsin.

Results: This study found no statistically significant ($p<0.05$) changes in the compliance of kids' meal beverage default offerings associated with the enactment of the Illinois Healthy Beverage Default Act in Illinois relative to that in Wisconsin at fast-food restaurants. There were some observed differences in results in the restaurants' physical locations versus online that are worth noting. That is, after the enactment of the Illinois Healthy Beverage Default Act, the results showed greater odds of fast-food restaurants exclusively offering healthy beverage defaults with kids' meals on restaurant interior (OR=1.83, 95% CI=0.93, 3.58) and drive-thru (OR=2.38, 95% CI=0.95, 5.96) menus, with weak statistical significance ($p<0.10$). However, the policy was not associated with either meaningful or statistically significant changes in healthy beverage default offerings on restaurant websites or third-party online ordering platforms.

Conclusions: This study found limited evidence of changes in kids' meal beverage offerings attributable to the Illinois Healthy Beverage Default Act. Future investigations of

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communication channels that support awareness and implementation and the resources required for implementation and enforcement may provide insight that is key to improving compliance.

INTRODUCTION

Studies of kids' meals offered in restaurant settings find that they are generally of low nutritional quality and that many meals fall short of recommendations from the Dietary Guidelines for Americans.[1−5] In addition, national studies show that ordering from a kids' menu is associated with purchasing sugar-sweetened beverages (SSBs)[6] and that both fast-food and full-service restaurant food and beverage consumption among children is associated with greater intake of SSBs and sugars in children's overall diets.[7] SSBs are the largest source of added sugars in American children's diets.[8] This is important because approximately two thirds of U.S. children aged 2−19 years exceed recommendations for added sugars intake,[8] and SSB consumption is associated with poor health outcomes, including obesity, among children.[9]

Given that just over a third of children consume fast food on a given day,[10] SSBs continue to be widely offered with kids' meals,[5] and default options may influence consumer purchases,[11−13] policymakers are seeking to remove unhealthy beverage default (i.e., automatically included, absent requests for an alternative beverage) offerings with kids' meals as a step toward reducing the prevalence of SSB intake among children. A recent review and content analysis documented that from 2010 to 2020, 20 healthy kids' meal laws were enacted, including 18 with provisions for healthy default beverages (14 city-level, 1 county-level, and 3 state-level laws).[14] In recent years, several additional kids' meal laws were enacted,[15] including a fourth state-level healthy beverage default (HBD) law passed in Illinois in 2021 and effective from January 1, 2022.[16] The Illinois HBD Act only allows water, 100% juice with size restrictions, and non- or low-fat unflavored or flavored milk or nondairy milk with calorie restrictions. Table 1 shows the variation in permitted beverages across the 4 existing state-level laws, with California having the most restrictive law (no flavored milk or 100% juice allowed as defaults) compared with Illinois and Delaware, which both allow flavored milk and 100% juice with varying fat, size, and calorie restrictions.

Understanding HBD policy implementation is important for assessing the extent to which these policies promote behavior change. HBD policies could reduce children's SSB intake at restaurants by making healthier beverage options easier to choose. In a full-service restaurant chain that voluntarily removed soda as the default option on kids' menus, orders of soda decreased, and orders of milk and juice increased after 1 year.[17] Changes in beverage orders were sustained over time,

Table 1. State-level Kids' Meal Healthy Beverage Default Provisions

State (effective)	Unflavored milk	Flavored milk	Nondairy alternative milk	100% Juice[a]	Water[b]
California (01/01/2019)	✔	X	≤130 calories Meeting NSLP standards[c]	X	✔
Hawaii (01/01/20)	Nonfat or 1% fat ≤8 oz	X	Nutritionally equivalent to fluid milk ≤8 oz	≤8 oz	✔
Delaware (07/17/20)	≤8 oz	≤8 oz	Nutritionally equivalent to fluid milk ≤8 oz	≤8 oz	✔
Illinois (01/01/22)	Nonfat or 1% fat ≤130 calories	Nonfat or 1% fat ≤130 calories	No added natural or artificial sweeteners ≤130 calories Meeting NSLP standards[c]	≤8 oz	✔

Sources: California: Cal. Health&SafetyCode§114379.20; Hawaii: HRS§321-30.3; Delaware: 16Del.C.§140B; and Illinois: 410ILCS620/21.5.
[a]A 100% fruit or vegetable juice or fruit/vegetable juice combined with water or carbonated water, with no added sweeteners.
[b]Water (plain, sparkling, or flavored) with no added sweeteners.
[c]Meeting NSLP standards (section 210.10 of Title 7 of Code of Federal Regulations).
NSLP, National School Lunch Program.

with soda representing 35% of children's beverage orders prior to menu modifications, 25% at 2-year follow-up, and 24% after 3 years.[18] Although these results are promising, the impact of larger-scale HBD policies on behavior change may be limited if restaurants subject to the policy do not implement the required changes.

Although HBD policies aim to include only healthy beverages as defaults offered with kids' meals (e.g., from menu boards, drive-thru, websites, and third-party delivery), they may not be explicitly mandated across all platforms, and even when mandated, they may not be enforced or fully implemented in practice. Indeed, although 85% of local- and state-level healthy kids' meal laws have specified penalties for violations,[14] evaluations of compliance of HBD laws to date show varied and mostly limited improvements to no improvements in the healthfulness of beverages offered by default with kids' meals. A pre−post study of HBD policies enacted in California and Wilmington, Delaware, found that the proportion of California restaurants exclusively listing HBDs in line with the policy on menu boards increased 7−12 months after the policy went into effect (10% before policy and 66% after policy), but verbal offerings of only healthy beverages remained low (5% of offers before policy and 1% after policy),[19] and no changes were found on Wilmington restaurant menu boards (30.8% before and after policy). Studies have also found limited implementation in online settings, including restaurant websites and third-party online ordering platforms. A postpolicy assessment found that only 5.6% −40.5% (with the range dependent on how compliance was defined) of observations in 13 restaurant chains offered beverages consistent with California's policy.[20] A similar postpolicy cross-sectional assessment of beverages offered through online kids' menus (restaurant website and 5 third-party platforms) in the cities of Los Angeles, Baltimore, and New York found 15%, 30%, and 43% compliance, respectively, with applicable state and local laws when using the most lenient definition of compliance.[21] For comparison, compliance was 7% −30% (with the range based on the different city policies) when these laws were applied to online restaurant menus in Boston, which does not have a HBD policy.[21] Two pre−post intervention−comparison site studies of HBD policies in 1 city[22] and 1 state[23] evaluated short-term (4 months after policy) compliance with HBD laws on online menus and found no change in intervention relative to comparison sites over time. Furthermore, there have been a number of voluntary programs that have aimed to improve the nutritional quality of kids' meals (e.g., National Restaurant Association's Kids LiveWell program and the Choose Health LA Restaurants initiative), but results associated with such programs have also found mixed improvements, including continued inclusion of sugary beverages with meals.[5,17,18,24−26]

Collectively, this research suggests that HBD policies have not been fully implemented, including 1-year or longer postpolicy enactment; in fact, the evidence reveals limited to no improvement in the healthfulness of beverages offered with kids' meals after policies are in effect. However, prior work is limited by study design. Multiple studies have been cross-sectional, collecting data only after policies were enacted, and many lacked a comparison group, making it difficult to determine whether menu modifications were due to policy implementation or a result of broader, secular trends. Only 2 prior studies have collected data before and after policy enactment, including comparison sites, but both assessed menus after 4 months, which may not be enough time to implement changes (e.g., owing to the time needed to change procurement). This study seeks to fill these research gaps by assessing fast-food restaurant implementation of the Illinois state-level HBD policy using a pre- and 1-year postpolicy intervention−comparison site study design. The authors examine changes in default beverages offered with kids' meals in a state with a policy (Illinois) and a comparison state without a policy (Wisconsin) where menu modifications are measured across 6 platforms, including interior menu boards, drive-thru menu boards, restaurants' own websites or applications, and 3 third-party online ordering platforms.

METHODS

A pre−post intervention−comparison site design was used to assess changes in default beverages offered with kids' meals after the policy effective date (January 1, 2022) of the Illinois HBD Act relative to changes in Wisconsin, a neighboring state with no such policy. Baseline field audits were conducted at fast-food restaurants in October−November 2021 to determine beverages offered on interior and drive-thru menu boards. Online menu data were collected in November 2021 from restaurants' own websites/applications and third-party online ordering platforms (DoorDash, Uber Eats, and Grubhub). Follow-up data were collected in restaurants in October−November 2022 and online in November −December 2022 (close to 1 year after the policy effective date).

Study Sample

For this study, fast-food chains were identified from the Nation's Restaurant News top 200 list of top revenue-producing chains.[27] Chains were selected that had locations in both Illinois and Wisconsin and did not

participate in a voluntary program (e.g., Kids LiveWell). Restaurants were sampled from 11 national fast-food chains offering kids' meals and operating in both Illinois and Wisconsin, including in both urban and rural settings, with urbanicity defined using the 2013 National Center for Health Statistics Urban-Rural Classification Scheme for Counties.[28] Specific restaurant locations were identified by Google searches. To support greater geographic representativeness, the selected urban areas in Illinois and Wisconsin (i.e., Cook County, Illinois, and Milwaukee County, Wisconsin) were each divided evenly into 8 smaller areas for sampling. The authors attempted to sample 1 restaurant of each chain in each nonurban area and each of the subareas within the 2 urban areas. Additional sampling methods have been described previously and can be found elsewhere.[23]

The initial evaluation sample comprised 176 fast-food restaurants from which the following exclusions were applied sequentially for each respective platform sample (Appendix Table 1, available online). First, restaurant observations were excluded for a given platform that could not be fully audited at baseline or at follow-up because (1) the establishment was temporarily closed (in 1 data collection period) or closed permanently (between the pre- and postpolicy data collection periods), (2) the restaurant was not available through the given platform, (3) data collectors were asked to leave by staff or were unable to take clear pictures of menu boards, or (4) the restaurant did not serve a kids' meal or served a kids' meal that did not include a beverage on a given platform. Second, restaurants were excluded if their overall compliance could not be determined at baseline or at follow-up because authors could not identify default milk and/or juice characteristics. Third, restaurants were excluded if they were part of a chain for which authors only had observations for 1 of the 2 states after the preceding exclusions. Appendix Table 1 (available online) contains details on numbers of restaurants excluded for each platform. The final analytic samples of restaurants for this study were 98 for the interior menu board, 79 for the drive-thru, 110 for the restaurant website/application, 82 for DoorDash, 77 for Uber Eats, and 62 for Grubhub. The weighted percentage of restaurants in urban areas was similar in both states for each of the analytic samples: 80% in Illinois and 67% in Wisconsin for the interior menu board, 71% in Illinois and 70% in Wisconsin for the drive-thru, 78% in Illinois and 68% in Wisconsin for the restaurant website/application, 72% in Illinois and 53% in Wisconsin for DoorDash, 85% in Illinois and 82% in Wisconsin for Uber Eats, and 89% in Illinois and 87% in Wisconsin for Grubhub.

Measures

This study used the Food Policy Program Fast-Food Restaurant Kids' Meal audit tool to collect and code data about kids' meal default beverage offerings from fast-food restaurant interior menu boards, drive-thru menu boards, website/applications, and 3 third-party online platforms. The Food Policy Program Fast-Food Restaurant Kids' Meal tool has been shown to be highly reliable (average kappa=0.89 for interior menu boards and 0.96 for online menus), and the tool is described in more detail elsewhere.[29] Data were collected about beverages offered with kids' meals and characteristics needed to determine policy compliance, including serving sizes for 100% fruit juice and fat content and calories for milk. Policy compliance was coded on the basis of strict adherence to all requirements as stated in the Illinois HBD Act. For restaurant interior and drive-thru menu boards, a default beverage was any beverage listed as being part of a kids' meal. For online menus, a default beverage was any beverage automatically visible with the kids' meal without navigation to a new page or window. Default beverages were classified into 1 of 18 mutually exclusive drink categories, which were used with characteristics of the beverages to determine policy compliance.

For supplementary analyses of cashier compliance, during field audits, data collectors asked the cashier, *Do you sell kids' meals?* If the cashier responded yes, data collectors then asked, *What drinks come with the kids' meal?* and recorded the cashier's response using a prespecified list of possible options or an other option if needed. If applicable, data collectors asked follow-up questions about fountain drinks (which fountain locations were included), kinds of milk, and types (100% versus not 100%) and sizes of juice included with the kids' meal. The compliance of the cashier offering was determined on the basis of the beverages specified. If the cashier said *anything you want* or something similar referencing the entire menu board, the compliance of the cashier offering was determined on the basis of coding of compliance of the interior menu board. At baseline, calorie information was not collected on cashier milk offerings, and that information was required to determine compliance in some instances. Because of that, at baseline only, where compliance of a cashier milk offering could not be determined, but milk was offered on the interior menu board, and compliance of that offering was determined, the compliance of the cashier milk offering was assumed to be the same as that of the interior menu board milk offering.

Statistical Analysis

For each of the 6 fast-food restaurant platforms, the authors computed summary statistics for the prevalence of overall compliance, SSB offerings, and offerings of types of compliant (water, milk, juice) and noncompliant (milk, juice, lemonade, soda, sports drinks, sweet/iced tea, other) beverages for restaurants in Illinois and Wisconsin before and 1 year after the policy effective date. Difference-in-differences logistic regression models with robust SEs clustered on restaurants were estimated to assess changes in overall compliance before to 1 year after policy in Illinois relative to that in Wisconsin for each platform. Each chain was weighted equally at each site and time period for both summary statistics and regression models. Statistical significance was determined on the basis of a prespecified alpha threshold of 0.05. Analyses were conducted using Stata/SE 17.0 (StataCorp LP).

RESULTS

Prior to the policy effective date, 24%, 33%, and 17% of restaurants in Illinois and 30%, 40%, and 23% of restaurants in Wisconsin were compliant with Illinois HBD Act standards for kids' meal default beverage offerings on their respective interior menu boards, drive-thru menu boards, and website/applications, respectively (Table 2). Compliance was higher (40%−50% in Illinois and 40%−57% in Wisconsin) across third-party online ordering platforms (Table 3). The most common default beverages offered in both states were compliant milk and juice (75%−83% of restaurants included compliant milk and 50%−71% included compliant juice). These compliant beverages were also commonly offered as defaults by third-party platforms (50%−79% for milk and 50%−70% for juice). Noncompliant milk and juice were offered as defaults by many restaurants on interior menu boards, drive-thru menu boards, and websites/applications in both states (47%−50% for milk and 20%−43% for juice) but were less available on third-party platforms (0%−30% for milk and 0%−20% for juice). SSBs were less common as default beverages on restaurant interior and drive-thru menus (26%−39%) but were widely offered on restaurant websites (63%−71%) and third-party online platforms (varying from 29%−36% on DoorDash to 60% on

Table 2. Prevalence of Default Beverage Offerings on Restaurant Platforms in Illinois and Wisconsin Before and After Illinois HBD Act

Beverage offering	Interior menu board				Drive-thru				Restaurant website/application			
	Illinois		Wisconsin		Illinois		Wisconsin		Illinois		Wisconsin	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Overall compliance	24	48	30	41	33	70	40	57	17	25	23	38
Compliant beverages												
Plain bottled water	12	21	15	19	8	13	19	14	42	38	43	31
Sparkling water	11	11	11	11	2	0	1	0	14	14	14	14
Milk[a]	75	75	75	75	80	80	80	80	83	67	83	67
Juice[b]	56	60	63	63	50	57	57	57	63	51	71	75
Noncompliant beverages												
Milk[c]	48	26	50	38	50	20	50	33	47	44	50	39
Juice[d]	22	28	22	26	20	23	23	20	38	38	43	27
Regular lemonade	32	23	26	22	35	20	31	23	14	35	17	34
Soda	32	23	26	22	38	20	39	23	71	61	63	48
Sports drinks	22	22	22	22	18	17	21	17	16	29	25	29
Tea or iced tea	28	12	26	17	35	20	28	20	30	28	33	29
Other[e]	22	17	26	22	14	9	19	12	32	43	29	34
Any SSB[f]	33	24	26	22	38	20	39	23	71	61	63	48
n	51	51	47	47	40	40	39	39	56	56	54	54

Note: Values correspond to percentages of restaurants with the given offerings or complying with the Illinois HBD Act. Unless otherwise indicated, sample sizes can be found in the last row. Statistics are weighted so that each chain receives the same weight in each site and time period.
[a]For the menu board, drive-through, and restaurant website/application, respectively, *n*=49, 37, and 54 for Illinois and 46, 37, and 52 for Wisconsin.
[b]For the menu board, drive-through, and restaurant website/application, respectively, *n*=50, 39, and 49 for Illinois and 47, 39, and 52 for Wisconsin.
[c]For the menu board, drive-through, and restaurant website/application, respectively, *n*=49, 38, and 54 for Illinois and 46, 38, and 52 for Wisconsin.
[d]For the menu board, drive-through, and restaurant website/application, respectively, *n*=50, 40, and 56 for Illinois and 47, 39, and 54 for Wisconsin.
[e]Other beverages included artificially sweetened lemonade and juice, unsweetened tea or iced tea, half-tea and half-lemonade mixtures, coffee, sparkling water sweetened with juice, Vitamin Water, limeade, slushes, and frozen drinks.
[f]For the menu board, drive-through, and restaurant website/application, respectively, *n*=48, 40, and 56 for Illinois and 47, 39, and 54 for Wisconsin. SSBs include any beverage with added sugars except for milk.
HBD, healthy beverage default; SSB, sugar-sweetened beverage.

Table 3. Prevalence of Default Beverage Offerings on Third-Party Platforms in Illinois and Wisconsin Before and After Illinois HBD Act

Beverage offering	DoorDash				Uber Eats				Grubhub			
	Illinois		Wisconsin		Illinois		Wisconsin		Illinois		Wisconsin	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Overall compliance	50	29	57	29	40	20	40	20	40	38	40	37
Compliant beverages												
Plain bottled water	35	44	33	43	20	22	16	20	19	22	13	17
Sparkling water	0	0	0	0	0	0	0	0	0	0	0	0
Milk[a]	71	71	79	79	60	60	70	70	60	60	50	50
Juice[b]	50	77	64	79	60	88	70	90	63	71	50	53
Noncompliant beverages												
Milk[c]	14	43	21	50	20	40	30	50	0	20	10	30
Juice[d]	7	13	0	14	0	20	0	20	15	23	20	23
Regular lemonade	7	21	10	14	0	30	0	16	36	32	20	3
Soda	36	29	21	21	40	40	30	30	60	42	50	33
Sports drinks	0	14	0	14	0	20	0	20	0	2	20	23
Tea or iced tea	7	9	0	5	0	13	0	0	4	2	3	0
Other[e]	7	20	0	14	0	30	0	20	20	32	3	0
Any SSB[f]	36	29	29	29	40	40	40	40	60	42	60	43
n	41	41	41	41	38	38	39	39	35	35	27	27

Note: Values correspond to percentages of restaurants with the given offerings or complying with the Illinois HBD Act. Unless otherwise indicated, sample sizes can be found in the last row. Statistics are weighted so that each chain receives the same weight in each site and time period.
[a]For DoorDash, Uber Eats, and Grubhub, respectively, *n*=40, 37, and 34 for Illinois and 41, 39, and 27 for Wisconsin.
[b]For DoorDash, Uber Eats, and Grubhub, respectively, *n*=41, 38, and 34 for Illinois and 41, 39, and 27 for Wisconsin.
[c]For DoorDash, Uber Eats, and Grubhub, respectively, *n*=39, 37, and 34 for Illinois and 41, 39, and 27 for Wisconsin.
[d]For DoorDash, Uber Eats, and Grubhub, respectively, *n*=41, 38, and 34 for Illinois and 41, 39, and 27 for Wisconsin.
[e]Other beverages included artificially sweetened lemonade and juice, unsweetened tea or iced tea, half-tea and half-lemonade mixtures, coffee, sparkling water sweetened with juice, Vitamin Water, limeade, slushes, and frozen drinks.
[f]For DoorDash, Uber Eats, and Grubhub, respectively, *n*=41, 38, and 35 for Illinois and 40, 38, and 26 for Wisconsin. SSBs include any beverage with added sugars except for milk.
HBD, healthy beverage default; SSB, sugar-sweetened beverage.

Grubhub). Plain bottled water was not commonly offered on any platform in either state (8%–43%).

Tables 2 and 3 show that at 1-year follow-up, the proportion of restaurants compliant with the policy increased across all restaurant platforms but decreased across all third-party platforms in both Illinois and Wisconsin. On restaurant interior and drive-thru menus, in both states, there were minimal changes in the proportion of restaurants offering compliant milk and juice default beverages with kids' meals. There was an increase in plain bottled water offerings in both states on restaurant interior menus; however, on drive-thru menus, plain bottled water offerings increased in Illinois and decreased in Wisconsin. On restaurant websites/applications, the proportion of restaurants offering compliant milk and plain bottled water decreased in both states, whereas the proportion of restaurants offering compliant juice only decreased in Illinois. On third-party online platforms, compliant juice and plain bottled water were offered by more restaurants after the Illinois policy in both states, but no changes were observed for compliant milk offerings. Noncompliant milk was offered by fewer interior, drive-thru, and website/application restaurant menus and by more third-party platform online menus in both states. SSBs were offered by fewer restaurants after the Illinois policy across all platforms (except for Uber Eats where it was unchanged) in both states. On the basis of supplementary analyses of verbal kids' meal beverage offerings by the restaurant cashier asked as part of the restaurant audits, the authors found that only 10% of cashiers offered compliant beverages with the kids' meal in Illinois both before and after the Illinois policy compared with 14% and 9% before and after the Illinois policy, respectively, in Wisconsin (not shown in tables).

The results from the DID regression models (Table 4) found no statistically significant ($p<0.05$) changes in the compliance of kids' meal beverage default offerings at fast-food restaurants 1 year after enactment of the Illinois HBD Act in Illinois relative to that in Wisconsin.

Table 4. Change in Overall Compliance in Illinois Relative to That in Wisconsin Before and After Illinois HBD Act

Platform		Difference-in-differences		
	n	OR	95% CI	*p*-value
Interior menu board	196	1.83	(0.93, 3.58)	0.078
Drive-thru	158	2.38	(0.95, 5.96)	0.065
Restaurant website/application	220	0.80	(0.30, 2.11)	0.649
DoorDash	164	1.33	(0.29, 6.23)	0.715
Uber Eats	154	1.00	(0.40, 2.51)	1.000
Grubhub	124	1.05	(0.30, 3.65)	0.940

Note: Results are shown from logistic regression difference-in-differences models with robust SEs clustered on restaurant. Models are weighted so that each chain receives the same weight in each site and time period.
HBD, healthy beverage default.

However, there were some observed differences in the results between offerings in the restaurants' physical locations and online that are worth noting. That is, after the enactment of the Illinois HBD Act, the difference-in-differences results showed greater odds of restaurants exclusively offering healthy default beverages with kids' meals on restaurant interior (OR=1.83, 95% CI=0.93, 3.58) and drive-thru (OR=2.38, 95% CI=0.95, 5.96) menus in Illinois relative to that in Wisconsin, with weak statistical significance ($p<0.10$). However, the policy was not associated with either meaningful or statistically significant changes in healthy default beverage offerings on restaurant websites or third-party online ordering platforms.

DISCUSSION

This study found that even before the Illinois HBD Act went into effect, many restaurants were offering default beverages that met the policy's kids' meal nutrition standards, with the majority offering compliant milk and juice. Nonetheless, offerings of noncompliant beverages were also highly prevalent, and so overall compliance was limited. Approximately 1 year after the policy effective date, there were no statistically significant changes in kids' meal HBD compliance across the 6 menu platforms assessed in this study. However, it is worth noting that compliance in Illinois increased from 24% to 48% for interior menu boards and 33% to 70% on drive-thru menus. When compared with changes in Wisconsin during the same time period, this translated to 1.83 times higher odds of compliance for interior menu boards and 2.38 times higher odds of compliance for drive-thru menus—an effect that was however only weakly statistically significant. There were no meaningful or statistically significant changes in compliance on restaurant websites/applications or third-party platforms, and in fact, compliance among restaurants in both states declined over time across all 3 third-party platforms. This is important given the increasing popularity in the use of online ordering for restaurants, particularly the use of online third-party meal delivery.[30]

Overall, less than half of Illinois restaurants were found to be compliant with the HBD Act 1 year after it went into effect (with the exception of the drive-thru menu, where compliance was 70%). This finding is consistent with prior research, which has generally found varying and limited implementation of HBD policies. For example, a study found that for California, despite increasing from baseline, only 66% of restaurants offered only compliant beverages on interior and drive-thru menus 7−12 months after that state-level policy went into effect, whereas it found no change for Wilmington, Delaware, where less than one third of restaurant menu boards were compliant after policy.[19] In the present study, compliance was lower on online platforms; only 25% of the restaurants' own websites/applications and 20%−38% on the third-party platforms offered default beverages compliant with the policy after 1 year. This is consistent with other studies, which have found no improvements and low compliance with healthy default beverage policies in online settings.[20−23]

The reasons for consistently low policy compliance, both within restaurants and on online ordering platforms, are not well understood. Inadequate communication and/or guidance from state or local agencies may be a contributing factor. As an example, a study in Delaware found that prior to the HBD policy effective date, very few restaurant managers (6%) were even aware that a state-level HBD policy had been adopted.[31] Another study found that after policy, the majority of managers interviewed in California (60.0%) and Wilmington, Delaware (93.3%) were not aware of the HBD policies that were effective in these jurisdictions.[19] Notably, the somewhat greater level of awareness in California may help explain the increase in compliance found there compared with the no change found in Wilmington. Although some local agencies publish policy guidance

on their websites, the full extent of outreach offering support to operationalize implementation is unclear. Another factor is the rise of alternative ordering and delivery methods, which raises questions about which vendors along the supply chain are responsible for ensuring implementation of state and local laws.[32] For example, for a local health ordinance in Philadelphia,[33] restaurant websites must be consistent with the ordinance, but third-party sites are not required to comply. Monitoring and enforcement strategies may also affect restaurant compliance. A content analysis of 18 healthy default beverage provisions found that in most jurisdictions, compliance is monitored during restaurant inspections, with fines issued for violations.[14] In practice, state and local agencies may not be executing enforcement authority, particularly in the wake of the coronavirus disease 2019 (COVID-19) pandemic, which led to restaurant closures and suspended government agency inspections.[34] Future research should investigate the reasons for limited compliance, particularly among online platforms. Successful implementation will be important for achieving the intended policy impact of improving children's diets.

Limitations

This research is subject to several limitations. First, the difference-in-differences estimation model relies on the assumption of parallel trends in the intervention and comparison sites, and because the authors only had data for 1 prepolicy time point, they were not able to provide evidence supporting this assumption.[35] However, because there could be broader trends among particular chains to develop healthier kids' meals, the authors made sure to include the same chains in both the Illinois and Wisconsin samples, which increases the plausibility of the parallel trends assumption, and it also accounts for potential competing interventions related to corporate restaurant policies that may have changed during the study period. Second, although the authors collected data from a comparison site, which was a strength, there may have been spillover effects in Wisconsin, particularly if procurement decisions in chain restaurants are made at the regional level. Third, because data were collected only in fast-food chain restaurants, the findings may not be generalizable to other settings, such as full-service or independently owned restaurants. Strengths of the study include use of a pre—post intervention—comparison site design, inclusion of restaurants in both rural and urban areas, a long follow-up period to allow adequate time for implementation, and use of a reliable measurement tool; in addition, this is the most comprehensive evaluation of an HBD policy to date, to the authors' knowledge, with changes in kids' meal default beverage offerings being assessed across 6 different menu platforms.

CONCLUSIONS

This study assessed fast-food restaurant compliance with an Illinois state policy requiring restaurants to offer only healthy beverages, including water, 100% juice, and milk, as default options with kids' meals. The authors used a pre—post intervention—comparison site design to assess changes to restaurant menus before and approximately 1 year after the policy effective date in Illinois and Wisconsin (a comparison state without a policy). The policy was not associated with statistically significant increased odds of restaurants offering compliant-only beverages on the kids' menus, and compliance remained low (with <50% compliance across all platforms, except for drive-thrus) 1 year after policy enactment. Although the results do suggest some modest, weakly significant improvements on interior and drive-thru menus, there were no improvements in menus on restaurant websites/applications or third-party online ordering platforms. To achieve intended potential policy impacts, future research should examine the reasons for limited compliance.

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CREDIT AUTHOR STATEMENT

Lisa M. Powell: Conceptualization, Methodology, Writing — original draft, Writing — review & editing, Supervision, Funding acquisition. Aline Vandenbroeck: Formal analysis, Data curation, Investigation, Writing — original draft. Julien Leider: Formal analysis, Data curation, Writing — review & editing. Andrea A. Pipito: Investigation, Writing — review & editing, Project administration. Alyssa Moran: Resources, Writing — original draft.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.focus.2024.100226.

REFERENCES

1. Batada A, Bruening M, Marchlewicz EH, Story M, Wootan MG. Poor nutrition on the menu: children's meals at America's top chain restaurants. *Child Obes.* 2012;8(3):251–254. https://doi.org/10.1089/chi.2012.0016.
2. Deierlein AL, Peat K, Claudio L. Comparison of the nutrient content of children's menu items at US restaurant chains, 2010−2014. *Nutr J.* 2015;14:80. https://doi.org/10.1186/s12937-015-0066-4.
3. Sliwa S, Anzman-Frasca S, Lynskey V, Washburn K, Economos C. Assessing the availability of healthier children's meals at leading quick-service and full-service restaurants. *J Nutr Educ Behav.* 2016;48(4):242–249.e1. https://doi.org/10.1016/j.jneb.2016.01.004.
4. Dunn CG, Vercammen KA, Frelier JM, Moran AJ, Bleich SN. Nutrition composition of children's meals in twenty-six large US chain restaurants. *Public Health Nutr.* 2020;23(12):2245–2252. https://doi.org/10.1017/S1368980019004907.
5. Moran AJ, Block JP, Goshev SG, Bleich SN, Roberto CA. Trends in nutrient content of children's menu items in U.S. chain restaurants. *Am J Prev Med.* 2017;52(3):284–291. https://doi.org/10.1016/j.amepre.2016.11.007.
6. Moran AJ, Subramanian SV, Rimm EB, Bleich SN. Characteristics associated with household purchases of sugar-sweetened beverages in US restaurants. *Obesity (Silver Spring).* 2019;27(2):339–348. https://doi.org/10.1002/oby.22380.
7. Powell LM, Nguyen BT. Fast-food and full-service restaurant consumption among children and adolescents: effect on energy, beverage, and nutrient intake. *JAMA Pediatr.* 2013;167(1):14–20. https://doi.org/10.1001/jamapediatrics.2013.417.
8. Bowman S, Clemens J, Friday J, Schroeder N, LaComb R. *Added sugars in American children's diet: what we eat in America, NHANES 2015−2016.* Dietary data Brief No. 26. Food surveys research group (USDA-ARS). Beltsville, MD: US Department of Agriculture; Published December 2019. https://www.ars.usda.gov/ARSUserFiles/80400530/pdf/DBrief/26_Sources%20of%20Added%20Sugars%20in%20Children's%20Diet_1516.pdf. Accessed November 1, 2020.
9. Bleich SN, Vercammen KA. The negative impact of sugar-sweetened beverages on children's health: an update of the literature. *BMC Obes.* 2018;5:6. https://doi.org/10.1186/s40608-017-0178-9.
10. Fryar CD, Carroll MD, Ahluwalia N, Ogden CL. Fast food intake among children and adolescents in the United States, 2015−2018NCHS Data Brief No. 375. Hyattsville, MD: National Center for Health Statistics; 2020. https://www.cdc.gov/nchs/data/databriefs/db375-h.pdf. Accessed September 1, 2023.
11. Dinner I, Johnson EJ, Goldstein DG, Liu K. Partitioning default effects: why people choose not to choose [published correction appears in *J Exp Psychol Appl.* 2011;17(4):432]. *J Exp Psychol Appl.* 2011;17(4):332–341. https://doi.org/10.1037/a0024354.
12. Friis R, Skov LR, Olsen A, et al. Comparison of three nudge interventions (priming, default option, and perceived variety) to promote vegetable consumption in a self-service buffet setting. *PLoS One.* 2017;12(5):e0176028. https://doi.org/10.1371/journal.pone.0176028.
13. Jachimowicz JM, Duncan S, Weber EU, Johnson EJ. When and why defaults influence decisions: a meta-analysis of default effects. *Behav Public Policy.* 2019;3(2):159–186. https://doi.org/10.1017/bpp.2018.43.
14. Perez CL, Moran AJ, Headrick G, McCarthy J, Cradock AL, Pollack Porter KM. State and local healthy kids' meal laws in the United States: a review and content analysis. *J Acad Nutr Diet.* 2022;122(10):1864–1875.e19. https://doi.org/10.1016/j.jand.2021.12.003.
15. Center for Science in the Public Interest. State and local restaurant kids' meal policies. Washington, DC: Center for Science in the Public Interest; Published July 2023. https://www.cspinet.org/sites/default/files/2023-07/CSPI%20Chart%20of%20Local%20Kids%20Meals%20Policies%20July%202023.pdf. Accessed September 1, 2023.
16. State of Illinois. Public Act 102-0681 amend. § 21.5. Default Beverage for Children's Meals, (2021). https://ilga.gov/legislation/publicacts/102/PDF/102-0681.pdf. Accessed August 1, 2023.
17. Anzman-Frasca S, Mueller MP, Sliwa S, et al. Changes in children's meal orders following healthy menu modifications at a regional U.S. restaurant chain. *Obesity (Silver Spring).* 2015;23(5):1055–1062. https://doi.org/10.1002/oby.21061.
18. Anzman-Frasca S, Mueller MP, Lynskey VM, Harelick L, Economos CD. Orders of healthier children's items remain high more than two years after menu changes at a regional restaurant chain. *Health Aff (Millwood).* 2015;34(11):1885–1892. https://doi.org/10.1377/hlthaff.2015.0651.
19. Ritchie LD, Lessard L, Harpainter P, et al. Restaurant kids' meal beverage offerings before and after implementation of healthy default beverage policy statewide in California compared with citywide in Wilmington, Delaware. *Public Health Nutr.* 2022;25(3):794–804. https://doi.org/10.1017/S1368980021001245.
20. Thompson HR, Martin A, Strochlic R, Singh S, Woodward-Lopez G. Limited implementation of California's healthy default beverage law for children's meals sold online. *Public Health Nutr.* 2022;25(7):2001–2010. https://doi.org/10.1017/S1368980022000039.
21. Zaltz DA, Lee DL, Woodward-Lopez G, Ritchie LD, Bleich SN, Benjamin-Neelon SE. Adherence to healthy default beverage laws for children's meals in 3 U.S. cities. *Am J Prev Med.* 2023;65(1):67–73. https://doi.org/10.1016/j.amepre.2023.01.023.
22. Pipito AA, Beal VG, Leider J, Powell LM. *No impact of the Columbus, Ohio, default beverage policy on children's meal beverage offerings four-months post-implementation.* Chicago, IL: Policy, Practice and Prevention Research Center, University of Illinois, Chicago; Published May 2022. https://p3rc.uic.edu/wp-content/uploads/sites/561/2022/06/Pipito_May-2022_RsrchBrf-No.-126_No-Impct-Columbus-OH-Dflt-Bev-Policy-Chldrns-Ml-Bev-Offrngs-4-mos.pdf. Accessed September 1, 2023.
23. Powell LM, Leider J, Pipito AA, Moran A. Evaluation of short-term changes in fast-food restaurant online kids' meal beverage offerings following a state-level healthy beverage default policy. *Curr Dev Nutr.* 2023;7(4):100045. https://doi.org/10.1016/j.cdnut.2023.100045.
24. Gase LN, Kaur M, Dunning L, Montes C, Kuo T. What menu changes do restaurants make after joining a voluntary restaurant recognition program? *Appetite.* 2015;89:131–135. https://doi.org/10.1016/j.appet.2015.01.026.
25. Harpainter P, Hewawitharana SC, Lee DL, et al. Voluntary kids' meal beverage standards: are they sufficient to ensure healthier restaurant practices and consumer choices? *Int J Environ Res Public Health.* 2020;17(15):5275. https://doi.org/10.3390/ijerph17155275.
26. Harris J, Hyary M, Seymour N, Choi Y-Y. *Are fast-food restaurants keeping their promises to offer healthier kids' meals?* Hartford, CT: University of Connecticut, Rudd Center for Food Policy and Obesity; Published 2017. https://healthyeatingresearch.org/research/are-fast-food-restaurants-keeping-their-promises-to-offer-healthier-kids-meals/. Accessed September 1, 2023.
27. Meet the top 200 restaurant chains in America. Nation's Restaurant News; https://www.nrn.com/top-200-restaurants/meet-top-200-restaurant-chains-america. Accessed May 15, 2021.
28. National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention. NCHS urban-rural classification scheme for counties, https://www.cdc.gov/nchs/data_access/urban_rural.htm, Accessed September 1, 2023.
29. Powell LM, Leider J, Pipito AA, Marinello S, Szkorla A, Moran A. *Development and reliability testing of a tool to assess default beverage offerings with kids' meals in fast-food restaurants.* Chicago, IL: Policy, Practice and Prevention Research Center, University of Illinois Chicago; Published 2022. https://p3rc.uic.edu/wp-content/uploads/sites/561/2022/08/Powell_Jul-2022_RsrchBrf-No.-127_Dvlpmnt-Rlblty-Tstng-Tool-Assess-Dflt-Bev-Offrngs-Kds-Mls-FF-Rstrn.pdf. Accessed September 1, 2023.

30. Online food delivery in the U.S. - statistics & facts. Statista. https://www.statista.com/topics/3294/online-food-delivery-services-in-the-us/#statisticChapter. Updated 2023. Accessed December 13, 2023.
31. Karpyn A, Lessard L, McCallops K, et al. Healthy default beverage policies for kids' meals: a statewide baseline assessment of restaurant managers' perceptions and knowledge in Delaware. *Prev Med Rep.* 2020;20:101272. https://doi.org/10.1016/j.pmedr.2020.101272.
32. Pomeranz JL, Cash SB, Springer M, Del Giudice IM, Mozaffarian D. Opportunities to address the failure of online food retailers to ensure access to required food labelling information in the USA. *Public Health Nutr.* 2022;25(5):1375–1383. https://doi.org/10.1017/S1368980021004638.
33. Philadelphia Department of Public Health. Understanding Philadelphia's sodium warning law: what chains need to know. Philadelphia, PA: Philadelphia Department of Public Health; Published 2019. http://foodfitphilly.org/wp-content/uploads/2019/09/Sodium-warning-label-admin-guidance-document-Sept-2019.pdf. Accessed September 1, 2023.
34. McGurk MD, Pirkle CM, Beckelman T, et al. Reinventing health promotion for healthy default beverage laws in the face of COVID-19. *Glob Health Promot.* 2021;28(1):79–83. https://doi.org/10.1177/1757975920986696.
35. Wing C, Simon K, Bello-Gomez RA. Designing difference in difference studies: best practices for public health policy research. *Annu Rev Public Health.* 2018;39:453–469. https://doi.org/10.1146/annurev-publhealth-040617-013507.