

Unhealthy changes in the foods we eat

- Pre-packaged, ultra-processed foods and drinks have become readily available in virtually every community around globe, across all income levels and population densities.¹⁻⁷ This increased availability combined with aggressive, pervasive marketing has dramatically affected the way people eat in many countries and resulted in much less healthy diets.⁶⁻²¹
- Many of these ready-to-eat or ready-to-heat foods and drinks contain high levels of added sugars, sodium, saturated fats, and refined carbohydrates. Excessive consumption of these nutrients

 as well as ultra-processed foods, in general is connected to increased risk and prevalence of obesity and many other chronic, nutrition-related diseases.^{8,22-33}
 - Substantial evidence shows that consuming too much **sugar** increases risks for type 2 diabetes, heart disease, liver and kidney damage, and some cancers.³²⁻³⁹ Global health experts recommend limiting sugar intake to less than 10% of total daily calories.^{31-33,40-43}
 - Consuming too much **sodium** is associated with high blood pressure and increased risks for heart disease, stroke, and death.⁴⁴⁻⁴⁷
 - Replacing saturated fats with healthy, polyunsaturated fats in the diet has been shown to improve blood sugar regulation and reduce heart disease risk in randomized controlled trials.⁴⁸⁻⁵⁰ The World Health Organization and many national dietary guidelines worldwide recommend limiting intake of saturated fats in addition to reducing sugar and sodium intake.^{51,52}
 - In addition to their often poor nutritional profiles, **ultra-processed foods'** hyper-palatability (and, some scholars argue, addictive nature⁵³⁻⁵⁵) and content of biologically harmful compounds (e.g., hormone-disrupting contaminants and industrial additives linked to inflammation and gut dysbiosis)⁵⁶⁻⁷⁰ are associated with increased overweight and obesity,⁷¹⁻⁷⁸ type 2 diabetes,⁷⁹⁻⁸¹ depression,^{82,83} heart disease and stroke,^{70,84-86} and mortality.⁸⁵⁻⁹⁰
- High concentration of nutrients-of-concern in products that offer few, if any, healthy vitamins, minerals, or other beneficial nutrients is problematic, as consumers have increasingly replaced healthier foods with "empty-calorie" products that are high in sugar, saturated fat, and sodium.⁶⁻²¹
- Increased worldwide consumption of ultra-processed, unhealthy foods and drinks is now seen as a major driver of the global obesity epidemic and increases in other nutrition-related diseases.^{6,9,91-96}
- An estimated 650 million adults worldwide have obesity and another 1.9 billion overweight roughly 40% of the adult population.⁹⁷ Prevalence of obesity and overweight for children and adolescents exceeds 340 million for ages 5–19 years and 38 million for children under 5 years old.⁹⁷
- Leading health organizations recommend reducing intake of these energy-dense, micronutrientpoor foods and drinks as a critical measure to combat the worldwide epidemic of obesity and related chronic diseases.^{23,98-100}

Consumers need help making healthier choices

- Not only have food and beverage products become less healthy over time, the sheer number of choices in stores makes it difficult and confusing for consumers to select healthier foods.^{6,7,10,72,91}
- Simpler, more impactful labels to guide consumers are needed: Most shoppers spend less than 10 seconds selecting each item while they shop — not enough time to review current back-of-thepack nutrition labels, which are complicated and ineffective for most consumers.¹⁰¹⁻¹⁰³
- Unhealthy products also frequently feature misleading health and nutrition claims on their packages.¹⁰⁴⁻¹⁰⁹ Claims related to particular nutrients (e.g., "high in calcium") and claims about a food's potential health benefits (e.g., "heart healthy") can give an otherwise unhealthy product a "health halo," leading consumers to misunderstand its nutritional quality and consume even more than they would otherwise.¹¹⁰⁻¹¹⁵

Front-of-package labels can nudge consumers and industry towards healthier products

- Consumers need a clear and easy way to make informed, healthier choices among the vast array of products available to them.
- Front-of-package (FOP) labels are a policy tool backed by decades of evidence that can effectively nudge consumers towards healthier foods and drinks while also encouraging industry to improve the nutritional profile of their portfolios.¹¹⁶ The World Health Organization (WHO) recommends FOP nutrition labelling as a key policy to promote healthy diets and reduce NCD prevalence worldwide.^{99,117} WHO focuses in particular on reducing consumption of foods high in sodium, saturated and trans fats, and added sugar and all their regional offices have implemented their own recommended approaches.¹¹⁸⁻¹²⁰
- Shoppers prefer simple FOP labels that are immediately visible and require less time to assess.^{121,122} Labels that minimize effort allow customers to quickly identify which products are less healthy, increase their intention to purchase a healthier product, and decrease their intention to purchase an unhealthy product.^{103,123-126}
- While a wide variety of FOP labelling approaches and designs are now in use worldwide, simple, negative warning labels that clearly identify unhealthy products have the most evidence for effectiveness at discouraging junk food and ultra-processed food choices.^{116,127-135}
- FOP warning labels such as those used in Chile (*introduced 2016*), Peru (2019), Israel (2020), Mexico (2020), Uruguay (2021), and soon in Brazil and Colombia (2022) require packaged foods and drinks that do not meet specific nutrition criteria or that contain certain ingredients such as non-caloric sweeteners to carry warning labels on the package front that clearly indicate the product is high in sugar, saturated or *trans* fats, sodium, or calories — whichever apply. These labels help consumers quickly and easily identify unhealthy foods and drinks and to make healthier choices from the vast array of available products.
- Requiring FOP warning labels may encourage manufacturers to improve the healthfulness of their products and portfolios to meet nutrition criteria and avoid carrying negative FOP labels.^{133,136,137}
- Unlike FOP labels that score or grade foods or ingredients on a negative (unhealthy) to positive (healthy) scale, warning labels only appear on products that pose the greatest nutritional health risk. This approach may be easier for consumers to notice (ie, warning labels are either present on a package or absent) and interpret (ie, less complex computations or comparisons between products).¹³⁸ Warning labels also do not risk creating a "health halo" around products with positive labels, which could lead to overconsumption of foods and drinks with higher-scoring labels.^{139,140}

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Chilean warning labels



Mexican warning labels



Evidence for warning labels

Warning labels work by helping consumers identify unhealthy products and discouraging them from consuming these products. Evidence to date suggests that nutrient warning labels offer the strongest FOP labelling approach in use today, particularly for the goal of reducing consumption of unhealthy, ultra-processed foods and drinks.

Evidence from experiments and surveys:

It is important to note that evidence in this section is from experiments or qualitative studies and may not necessarily translate into real-world changes in purchases, consumption, or health outcomes. Laboratory studies and surveys that test labels' ability to influence consumer



preferences, attitudes, and intentions are important, but the ultimate test of any label system will be seen in studies of actual food purchases.

- A 2021 meta-analysis of over 100 studies examining the effects of color-coded and warning labelling schemes found that nutrient warning labels work better than traffic light and Nutri-Score labels to discourage unhealthy product purchases and lower the amount of calories and saturated fat purchased, but Nutri-Score was better able to nudge consumers towards buying healthier products. Nutrient warning labels still outperformed the other label types for the net effect of overall healthfulness of purchases.¹¹⁶
- A 2020 meta-analysis of 14 experimental studies found that out of all the main FOP label systems currently in use, only "high in" warning labels significantly reduced the calorie and sugar content of purchased products compared to no label (-0.67 g sugar and -4.43 calories per 100 g).¹⁴¹ Warning labels also significantly reduced the sodium content of purchases (-34 mg/100 g), as did "traffic light" labels (-35 mg/100 g), but no effects on purchasing were found for Health Star Rating, NutriScore, or "Facts up Front"/Guideline Daily Amount labels.
- Studies using eye-tracking technology to evaluate warning labels compared to industry's Guideline Daily Amount (GDA) labels or to a no-label control have found that warning labels are best able to attract consumers' attention and help them more quickly and easily process and identify whether a product is unhealthy.^{113,142-144}
- FOP warning labels on sugary drinks have been linked to decreased purchases of sugary beverages, decreased perceptions of their healthfulness, and decreased purchasing intent in studies from the United States and New Zealand.^{145,146}
- Among adolescents, a test of five different FOP labels in six countries (Australia, Canada, Chile, Mexico, the United Kingdom, and the United States) found that compared to a no-label control condition, the "high in" octagon warning label had the greatest impact on perceived healthfulness of a sugar-sweetened beverage in five out of the six countries.¹⁴⁷ GDA and Nutri-Score labels had the lowest impact in all countries.
- In Uruguay, a study comparing FOP warning labels to "traffic light" labels and industry GDA-style labels found that warning labels better helped consumers correctly identify products high in unhealthy nutrients.¹⁴⁸ Consumers perceived products bearing warning labels as less healthy than the same products featuring GDA or traffic light labels.
- Also in Uruguay, warning labels on snack foods were shown to have a greater relative impact on children's choices than traffic light labels¹⁴⁹ and to better capture adult shoppers' attention and discourage choosing products with warnings compared to a GDA-style label¹¹³ or alone.¹⁴⁴
- Counter to industry's claims that consumers perceive "high in" FOP labels as too harsh or restricting of their control, a large survey of young adults in Canada viewing warning labels on beverages found that the vast majority (93%) felt either more or no change in their own level of control, and most thought that the symbols were either "about right" or "not harsh enough."¹⁵⁰
- A shopping experiment in Canada found that participants who saw "high in" nutritient warning labels purchased less calories, sugar, and saturated fat from beverages and less calories and sodium from foods, compared to participants who saw no FOP label.¹⁵¹ These reductions were further enhanced in conditions with taxes on sugary drinks or snacks. Warning labels outperformed traffic light, Health Star, and nutrition grade (i.e., Nutri-Score) labels.
- In Brazil, studies have found that warning labels significantly outperform traffic light labels and GDAs in capturing consumers' attention; improving their ability to identify healthier products and products high in nutrients of concern; and increasing their intention to buy a relatively healthier option.^{152,153} Compared to only an ingredient list and a nutrition facts panel, the presence of warning lables improved understanding and perceptions of a product's nutrient profile, and was particularly helpful for identify nutrients in excess.¹⁵⁴

- A large survey of parents from four Latin American countries found that the most vulnerable parents (i.e., those with low education and overweight) preferred a warning label FOP system over GDAs or traffic light labels.¹⁵⁵
- A survey of adults from Mexico and the United States (White and Latino) compared consumers' understanding of four FOP label types — warning labels, GDAs, multiple traffic lights, and Health Star Ratings — and a nutrition facts table. Warning labels were the easiest for subjects to understand: Subjects were 4.8 times more likely to report understanding the warning label compared to the nutrition facts table.77
- A survey of low- and middle-income Mexican consumers similarly found that warning labels outperformed both traffic light and GDA labels for consumer understanding: The odds of subjects correctly identifying a product with the lowest nutritional quality was 4.5 times greater for warning labels compared to GDAs.¹⁵⁶
- A report from the Health Evidence Network based on evidence from 15 countries in the WHO European Region concluded that a FOP label system that is 1) mandatory; 2) provides negative. evaluative judgments; and 3) is consistent, government-led, and applied widely across all products is a more effective way to support consumers in making healthier choices.¹⁵⁷

Real-world evidence from Chile: The world's first mandatory FOP warning label policy

Since Chile's FOP warning labels began appearing on packages in 2016 (right), they have contributed to shifts in social norms and behaviors around purchasing healthier foods and drinks as well as healthier product reformulation. Real-world evidence shows that Chilean consumers are aware of and understand the labels, and they are using them to make food purchase decisions.



Ministry of Health, Santiago, Chile

- Purchase changes: In conjunction with restrictions on junk food marketing to children and bans on the sale and promotion of regulated foods in schools, Chile's FOP warning label policy has been associated with a roughly 24% drop in sugary drink purchases,¹²⁸ and declines in sodium (-37%), total calories (-24%), calories from sugar (-27%), and calories from saturated fat (-16%) purchased from all foods and beverages during Phase 1 of the law's implementation.¹²⁹
- ▶ Focus groups with low- and middle-income mothers suggest profound changes in attitudes toward food purchases, driven both by knowledge mothers gained from seeing these labels and by children telling their mothers not to purchase unhealthy products with warning labels.^{130,131}
- Consumers in Chile understand that increasing numbers of warning labels on a package means that the product is less healthy and poorer choice than options with fewer or no warning labels.¹³²
- An evaluation comparing the nutritional profiles of products before and after the first year of Chile's FOP and other regulations found significant reductions in the proportion of products that would be required to carry "high in" sugar and sodium warning labels, suggesting that companies reformulated products to avoid the FOP warning label and other policy restrictions.¹³³

Momentum continues to build behind FOP warning label policies around the world:

- ▶ Peru (2019), Mexico (2020), and Uruguay (2021) have recently enacted policies requiring FOP warning labels similar to Chile's (black-and-white stop sign warnings).¹⁵⁸⁻¹⁶¹
- Brazil and Colombia have passed laws that will require FOP warning labels beginning in 2022, and Canada and South Africa are currently developing policies.¹⁶²⁻¹⁶⁵
- In 2020, Israel implemented a policy requiring negative warning labels for products high in sugar, sodium, or fat as well as a voluntary, positive label for products that meet very high nutrition standards (*right*).^{166,167} Early evidence



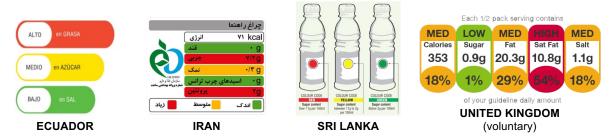
indicates Israeli consumers are already using the labels to make healthier choices:

- In the first month of label implementation, nearly 60% of Israeli adults surveyed reported using the new FOP labels to some extent, and 70% said they were willing to change their purchases to buy healthier products.¹⁶⁸
- Over 80% of adults in another survey reported that they intended to purchase fewer red-labelled (81%) and more green-labelled (85%) products. These intentions were even higher for respondents with higher BMI or lower education, suggesting a greater impact for groups that may benefit most from the label policy.¹⁶⁹

Warning labels outperform other FOP label types

Traffic Light Labels (TLLs)

TLLs use green, amber, and red colors to indicate whether a product has low, moderate, or high levels of nutrients of concern. TLLs can vary in complexity and appearance, as shown below in the examples below (mandatory labels from Ecuador, Iran, and Sri Lanka and the voluntary TLL-GDA hybrid used in the United Kingdom).



Experiments comparing different label types have found that while TLLs test moderately well for outcomes such as consumer liking/acceptibility, understanding, and improving behavioral intentions, they are still generally outperformed by warning labels in these experimental outcomes and, importantly, in changing actual purchase behaviors.^{116,128,138,141,170,171} TLLs can also confuse consumers by sending unclear messages about whether a product contains excessive amounts of added sugar, sodium, or saturated fats.^{116,152,156,172}

- A 2017 study comparing different label types found that TLLs and GDAs were both worse than warning labels at helping consumers identify products with high content of unhealthy nutrients and that consumers perceived products with warning labels as less healthy than the same products featuring TLLs or GDAs.¹⁴⁸
- Another 2017 study comparing Uruguyan children's perceptions of foods with TLLs vs. warning labels found that warning labels had greater relative impact on children's food choices.¹⁴⁹
- TLLs confused consumers in Mexico, who found the multiple colors difficult to compare across products and the intermediate/amber color particularly hard to interpret.¹⁷²
- In 2014, Ecuador implemented a mandatory TLL for packaged, processed food products.¹⁵⁸ Evidence thus far indicates that despite consumers' awareness and understanding of the label, it has not led to the changes in purchase behaviors observed under Chile's warning label policy:
 - Data from Ecuador's 2018 National Health and Nutrition Survey indicate that while 79% of the nearly 41,000 participants reported to be aware of the country's TLL of whom 88% said they understood the label only 21% reported actually using the TLL to inform their food purchases.¹⁷³
 - Two studies examined consumer purchases in the first year of regulation and found no evidence that TLLs significantly affected households' carbonated soft drink-buying habits.^{170,174}
 - In the first year of Ecuador's TLL policy, one study found evidence of modest product reformulation, with an observed average sugar reduction of 0.93 grams per 100 mL of beverage.¹⁷⁴

Nutri-Score

Introduced as a voluntary label in France in 2017 and since taken up by five other European countries,¹⁷⁵ the Nutri-Score label (*right*) uses a color spectrum similar to TLLs along with letter grades to provide a summary indicator of product healthiness. Scores are based on a nutrient profiling model that takes into account product ingredients' health risks as well as h



NUTRI-SCORE

model that takes into account product ingredients' health risks as well as benefits (ie, a product's fiber, protein, or fruit, vegetable, legume, nut, or healthy oil content).¹⁷⁶

Like TLLs, Nutri-Score labels have tested relatively well in surveys and laboratory experiments in terms of consumer acceptability and ability to correctly rank relative healthiness within a given product set,^{116,138,177-183} but it remains to be seen whether this will translate into meaningful changes in consumer behaviors, particlarly with regard to reducing consumption of unhealthy, ultra-processed foods and beverages.

- A 2021 meta-analysis that examined Nutri-Score alongside other label types found that in experimental studies, Nutri-Score was easy for consumers to understand and successful at nudging them towards healthier purchases.¹¹⁶ It was outperformed by nutrient warning labels at discouraging unhealthy purchases and in the overall healthfulness of purchases, however.
- A 2016 field experiment examined changes in the nutritional profile of food purchases after placing Nutri-Score labels on real foods in four product categories across 60 French supermarkets.¹⁸⁴

While the Nutri-Score label was associated with a 14% increase in the nutritional profile of purchases from the healthiest product categories (namely fresh, prepared foods), it had no impact on the nutritional profile of purchases from less-healthy categories. The label's net effect was a 2.5% improvement in the average nutritional score of purchases.

Notably, effect sizes observed in the study were 17 times smaller on average than those found in comparable laboratory studies, highlighting the importance of studying real-world effects of FOP labeling policies.¹⁸⁴

- Two years after Nutri-Score's adoption in France, self-reported awareness of and support for the label was very high in a consumer survey, but less than half of respondents reported changing their shopping behaviors because of the label.¹⁸⁵
- A pilot study in Spain found that while subects noticed Nutri-Score labels on packages, they did not have a significant effect on attitudes, taste perceptions, and purchase intentions.¹⁸⁶

Studies have not yet examined the real-world impact of Nutri-Score labels on purchase patterns, consumption, or the food supply in the countries where they are in use. It is also not yet well understood how widely food companies are choosing to apply the voluntary label and whether this coverage differs by product type (eg, used more for healthy products vs. unhealthy products).

For example, a 2020 study from Belgium estimated that in the first year of Nutri-Score label use, only 10% of the country's food supply featured the label, and the majority of those products were given healthy "A" or "B" ratings.¹⁸⁷ This could have important implications for the label's effectiveness, as an experiment found greatly reduced benefits when labels are not widely adopted.¹⁸⁸

To date, Nutri-Score has been adopted exclusively in European countries, where any mandatory labelling regulation would have to be approved by the European Union Commission and harmonized for all EU member states. In the context of the Commission's intention to propose a mandatory nutrition labelling model by the end of 2022, a large coalition of European scientists and medical associations have expressed strong support for making Nutri-Score the mandatory label system for all of Europe.¹⁸⁹

Industry-endorsed, voluntary FOP labels are not effective

The most common FOP system in use globally is industry's voluntary **Guideline Daily Amounts** (**GDAs**, also called "Facts Up Front," Reference Intakes, or Daily Intake Guides, depending on region).¹⁹⁰⁻¹⁹³ GDA-style labels were developed



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by grocery manufacturing and distribution associations in the UK and US and later adopted with

slight variations by industry associations in many other countries, despite little to no evidence of positive impact for consumers.¹⁹⁴ In the US, the 2011 introduction of "Facts Up Front" labelling by the Grocery Manufacturers Association was viewed by health experts as a strategic — and successful — maneuver to pre-empt ongoing government development of a mandatory FOP labelling policy.^{195,196}

GDA-style labels typically display nutrient content per serving (not necessarily per package) for nutrients such as calories, saturated fat, sugars, and sodium, as well as the percentage of an average adult's recommended daily intake for each nutrient. Despite their ubiquity, these labels are generally regarded as unhelpful or confusing for customers.

Limitations of the GDA/DIG/"Facts Up Front" label approach include:

- Benchmark values are not based on international nutrition recommendations and are calculated using an average adult's intake, even on products specifically targeted to or consumed by children;
- GDA labels are displayed in arbitrary serving sizes making it difficult for consumers to compare different products in the same category and are smaller than what people realistically consume;
- Serving sizes are also graphically displayed in very small text, which could lead shoppers to think that label values refer to the full package contents;
- The nutrients included in a GDA label are inconsistent across products. For example, a product with very high sugar content may only feature a GDA label for calories.
- When fiber and micronutrients are included in the label, companies present percentages of *minimum* recommended intakes, whereas for sugars, fats, saturated fats, and sodium, they present percentages of *upper* consumption limits;
- Properly interpreting a GDA label takes more time most shoppers spend reading a nutritional label, and requires a high level of nutrition knowledge and mathematical skills.¹⁹⁷

GDAs perform poorly compared to other FOP labels and do not help consumers:

- Independent studies comparing GDA-style labels with other systems (e.g., multiple traffic lights, the Nutri-Score system, Choices International, HealthStar Rating, and warning labels) consistently find that GDAs are the most confusing, take shoppers the most time to evaluate, and are ultimately least effective for encouraging consumers to make healthier choices.^{147,153,156,198-206}
- Studies in Mexico, Uruguay, Mexico, Ecuador, Chile, and Brazil have all found GDAs to be the weakest of any labelling system currently used in Latin America.^{113,143,147,149,172,197,204,207-209}
- In Mexico, studies show that consumers across age, education, and income groups have a hard time understanding GDA labels and do not use GDAs to make food choices.^{156,172,197,210,211}
- Eye-tracking studies from the United States, Uruguay, and Chile found that compared to warning labels, GDAs are less effective at getting consumers' attention, harder to process, and worse at helping to identify unhealthy products.^{142,143,212}
- Studies in Australia and New Zealand found that GDAs (referred to there as Daily Intake Guides) were least preferred by consumers and least helpful for discriminating between healthy and unhealthy products, compared to traffic light and Health Star Rating labels.^{213,214}
- In the United Kingdom, introduction of GDA labels did not affect shoppers' product choices among yogurts or ready-meals.²¹⁵
- Companies often place GDAs on packages alongside other, more prominent labelling and marketing such as nutrient or health claims, which further confuses consumers.^{110-112,216,217}

Key elements for developing an effective FOP labelling system

- Developing or selecting a strong nutrient profiling model is a key first step toward creating the FOP label policy.²¹⁸⁻²²⁰ The model should set clear and meaningful criteria based on evidence of diet-related health risk and nutritional guidelines to determine which products must carry labels.^{117,221}
- FOP labels should be immediately and easily visible on the package. Sizing and placement specifications should be made clear in the regulation. For example, the Chilean FOP policy sets specific size requirements for a wide range of packaging formats from bubble gum to breakfast cereal and offers a good starting point for other countries to consider.
- Label designs should be simple and clear:
 - Simple FOP labels enhance understanding and use of nutrition information, especially for consumers with less education and nutrition knowledge.^{124,222,223}
 - Interpretive FOP labels work by using simple designs and easy-to-understand language to draw attention to key nutrition information, facilitate rapid comprehension, encode information into working memory, and make it easier to discriminate between healthy and less healthy options.^{124,134,223-226}
 - To this end, lables should avoid numeric information, use symbols, shapes, and colors that leverage consumers' automatic associations, and warn or caution consumers using words or phrases such as "excess," "high," "avoid," or "warning."¹³⁴
- Successful development and implementation of a FOP label policy will depend on strong supporting evidence, a transparent process that includes pilot-testing of label systems, collaboration by different stakeholders, and strong political leadership.²²⁷
- A strong FOP label system must be mandatory for all companies and apply to all product types. Evidence indicates that applying a label to only some products can lead to misleading perceptions of the healthfulness.^{116,228} Voluntary labelling systems can lead to multiple types of logos and labels, which increases confusion and decreases the usefulness of the logos.
- Ideally, where FOP warning labels are required, health and nutrition claims should be prohibited. Product packages that feature both warning labels and positive claims confuse consumers. In Mexico, for example, the FOP warning label law implemented in 2021 prohibits products with one or more warning lables from featuring health or nutrient claims on the package.¹⁶¹
- Endorsement of a label by trusted government or scientific organizations increases credibility.^{124,229}
- Criteria for the labels should be made public in advance to educate consumers and manufacturers and to encourage product reformulation.¹³⁶ Industry should be allowed to comment publicly on the criteria but should not be permitted to intervene in its development.²²⁷
- Ongoing monitoring procedures and mechanisms for enforcement should be established as part of the policy to ensure consistent uptake and compliance, evaluate the policy's impacts, and inform continuous improvements and updates, as needed.¹¹⁷ These should be coordinated through a government agency or independent group without conflicts of interest.



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