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Public Health Role in the Use of GLP-1 Agonists in the Treatment of Diabetes and Obesity

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ABSTRACT

The objective of public health is usually to promote and demonstrate wellness and prevent injury and disease as well as impede premature morbidity and mortality. The WHO guideline tends to offer directives for usage of GLP-1–based pharmacotherapies in adults having obesity, determine research and implementation lacunae. GLP-1 therapy must not substitute for obesity prevention, though. A small GLP-1 implant constitutes the recent prospect to aid patients sustain weight loss. The accessibility or availability of GLP-1 medications ought to stimulate the global community to construct an equitable, integrated, and sustainable obesity ecosystem. This article aims to present the geopolitical and public health implications of GLP-1 RAs usage in the treatment of diabetes and obesity, with recmmendable strategies whereby access can be achieved equitably. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are medications which mimic the natural gut hormone GLP-1. These medications lower blood sugar, retard stomach emptying, and target the brain to enhance fullness feelings. These impacts extremely diminish appetite, culminating in pronounced weight dissipation with improved cardiac and renal health. The dual GLP-1/GIP agonist tirzepatide achieves better outcomes reaching approximately 22.5% weight decrement. In addition to weight dissipation, these agents offer significant cardiovascular advantages including 14% decrement in principal severe cardiovascular events and prominent benefits in cardiac failure outcomes. The four main GLP-1 agents are Dulaglutide (Trulicity) Exenatide (Bydureon) Liraglutide (Victoza or Saxenda) Semaglutide (Ozempic or Wegovy). Public health tends to augment the well-being of diverse communities via disease surveillance, health education, preventive medicine, research, and policy development. A vast majority of payers will cover GLP-1s for the treatment of type 2 diabetes and are elevating coverage for other FDA-approved indications, for instance, sleep and cardiovascular health. Budgets and prevention policies need to be safeguarded in accordance with the expansive spread of GLP-1 weight loss medications. The article highlights the socioeconomic factors affecting availability and access to GLP-1 therapies and the ethical invariance of not prioritizing pharmaceutical interventions beyond systemic health progress, thus, preventing medicinal monopolies and their influence on health equity. The multisectoral considerations of this work inarticle is pertinent, offering insights to bridge the gap between public health, pharmacognosy, pharmaceutical and geopolitics as well as the scalability of GLP-1 RAs expansive potential. In sum, this review provides a significant analysis capable of guiding future research and policy formulation, with contributions at the intersection of clinical advancement, health policy, and international public health, paving trajectories for sustainable and equitable healthcare solutions, opportunities and priorities in an increasingly interconnected global sphere.

Keywords

Geopolitics, Hypothalamus, Comorbidities, Access, Equity, WHO, Fake drugs, Equity.

Introduction

Extant GLP-1 RAs updates constitute Medicare presenting a bridge programme permitting veritable beneficiaries accessibility to weight-loss medications at $50 monthly. Within drug pipeline media, the FDA gave approval for Eli Lilly's Foundation, the initial non-peptide oral GLP-1 for obesity, whereas Novo Nordisk's CagriSema expects FDA decision [1,2]. Furthermore, the FDA has been targeting compounding pharmacies and telehealth platforms

trafficking GLP-1 variants illegally as "generic" or FDA approval. Currently, Poison Control centres received expansive 1000% increment in phone calls concerning unintended therapeutic overdoses as these medications become extremely accessible [3].

A study detected significant intracellular signaling mechanisms which are connected with the weight loss impacts of the GLP-1 medication, semaglutide. The results tend to explicate how the increasing prevalence of GLP-1s could affect human behaviour, and determine newfangled opportunities and priorities for treatment improvement [4] for the future. GLP-1s effects are liable to be prolonged as the study suggests, potentially decreasing how frequently the medications are administered. cAMP modulation may constitute a trajectory to overcome obstacles faced by numerous patients. The effect of weight depreciation from the drugs is associated with elevated levels of the signaling cAMP in the postrema of the brain containing circuits correlated with appetite. In the study, increment differed from neuron to neuron, with semaglutide efficacy, the average decrement in weight from baseline was 10.2%, however, 4.9% of patients achieved an excess of 25% decrement [5].

In order to address the increasing global health issues of obesity [6] affecting more than 1 billion persons, the World Health Organization (WHO) has formulated its initial guideline [7] on the application of Glucagon-Like Peptide-1 (GLP-1) therapies for obesity as a chronic, relapsing disease. Obesity affects persons the world over, and in 2024, resulted in circa 3.7 million mortalities globally. In the absence of decisive action, the number of persons presenting with obesity is estimated to double by 2030. In September 2025, WHO included GLP-1 therapies to its Essential Medicines List for the management of type 2 diabetes in high-risk groups. Within the recent guideline, WHO released conditional recommendations in the usage of the therapies to support persons having obesity to overcome the adverse health problem [8] in an encompassing strategy that involves healthy diet consumption and regular physical activities undergirded by health personnel. As obesity is a major global public health challenge, the WHO has committed itself in addressing it in undergirding nations and persons every where to effectively and equitably prevent and control the anomaly as a chronic disorder handled comprehensively with lifelong care. Although, therapies cannot solely resolve this global health scourge, but GLP-1 medications can assist in circumventing obesity and mitigating its associated sequelae [6,9]. These are crucial as obesity is a complex, chronic disease and a major driver of noncommunicable disorders, for instance, cardiovascular diseases, type 2 diabetes and certain forms of cancer which contribute to poorer outcomes for patients presenting with infectious diseases [10,11]. By 2030, In excess of it's health effects, the worldwide economic cost of obesity is estimated to be US$ 3 trillion annually. The guideline can assist efforts to diminish skyrocketing health costs connected with managing the disorder and related health sequelae [12].

This review article aims to explore the geopolitical and public health implications of glucagon-like peptide-1 receptor agonists (GLP-1 RAs) consumption in diabetes and obesity therapeutic regimen. The implications, emphasis and priorities pertain to equitable access and strategic deployment of these pharmacotherapies or medications globally in a safe manner. This review is framed to provide an analytical perspective that takes into cognizance the inherent intricate complexities involved in tackling global obesity and diabetes [6,9] through pharmacological interventions.

WHO policy and implementation insights

The recent WHO guideline presents two prominent conditional recommendations that GLP-1 drugs may be consumed by adults, however, excepting pregnant women, for the long-run obesity therapy [13] Whereas the efficacy of the medications in the treatment of obesity and improvement of metabolic and other outcomes exists, the recommendation is conditional resulting from paucity of data on their long-run safety and efficiency, maintenance, sustenance, and discontinuance, prevailing costs, inadequacy in health-system preparedness and provision, potential equity consequences or inequitable distribution of resources. Indepth behavioural interventions, such as structured interventions inculcating healthy diet or nutrition and physical activity, may be provided for obesity adults on prescribed GLP-1 medications. This is dependent on low-certainty evidence suggestive of enhanced therapeutic outcomes [13].

The guideline focuses on the pertinence of fair and justifiable access to GLP-1 therapies, preparing and supporting health systems in the consumption of the drugs. Excluding deliberate policies, access to these therapies may escalate extant health disparities and dysfunctionalities. WHO drives and tasks for immediate and prompt action in the formulation, manufacturing, production, accessibility, affordability, and system preparedness to meet urgent global needs and requirements. By 2030, despite accelerated expansive production, GLP-1 therapies are predicted to reach less than 10% of beneficiaries [12,13]. The guideline is predicated on the global community to be cognizant of strategies to extend access, inter alia concerted procurement, tiered pricing, and voluntary licensing.

The WHO guideline was developed by responding to suggestions and requests from Member States in order to address the challenges, issues, opportunities and priorities regarding obesity and it's compounding effects [14]. The mechanism for the development of the guideline encompassed expansive analysis of available and accessible evidence, including consultation with a broad magnitude of stakeholders, such as persons having the experience. The guideline is a pivotal process deliverable within the WHO acceleration platform to harness and obliterate obesity, its comorbidities and sequelae as to be updated frequently with emerging and reemerging evidence.

Medication alone will not reverse the obesity challenges and issues

Although, GLP-1 therapies constitute the initial efficacious treatment modality regarding obesity adults, the WHO guideline stipulates that medications cannot solely be the solution to the

impairment. Obesity is not merely a personal concern but also a societal issue, challenge, opportunity and priority necessitating multisectoral functionalities [15]. The obesity quagmire needs a primordial reorientation of extant strategies to an encompassing strategy erected with three pillars (i) creating healthier ambients via robust population-level policies for the promotion of health and obesity prevention; (ii) protection of persons at high risk of the development of obesity and associated comorbidities by means of targeted screening and structured prompt interventions; and (iii) ensuring accessibility and equitable distribution of medications and resources to lifelong and individual-centred care to vulnerable and low-income precincts [7,8].

Diverse studies have comprehensively analysed the potential benefits, challenges, issues, opportunities and priorities intertwined with the global dispensing of GLP-1 RAs. It explicates the dual action of the drugs in promoting weight loss and enhancing cardiovascular health, thus, positing them as prominent therapeutic agents for diabetes and obesity. This review draws upon extant World Health Organization (WHO) guidelines in framing modalities for equitable access, highlighting the economic and systemic barricades which could restrict expansive usage [13]. This research presents the stance that global health strategies must aim for inclusive, equitable treatment as entrenched in the rationale of public health and international health policy.

GLP-1 RAs, hypothalamus, Obesity and type 2 diabetes

GLP-1 agents, for instance, semaglutide and liraglutide invariably target the hypothalamus to enhance satiety. They activate POMC/CART neurons which suppress appetite while restricting NPY/AgRP neurons which induce hunger in the arcuate nucleus. Furthermore, these stimulate dorsomedial hypothalamus (DMH) neurons to trigger pre-ingestive satiety, extensively reformating satiety signals in the brain [16].

Glucagon-like peptide-1 (GLP-1) receptor agonists (RAs) are pivotal in the management of obesity and type 2 diabetes, essentially through appetite inhibition and metabolic regulation. Centrally, GLP-1 RAs modulate brain regions governing appetite, driving neurotransmitter and peptide discharge to regulate hunger and energy dispensation. Peripherally, GLP-1 RAs enhance glycemic regulation by inducing insulin secretion, decreasing glucagon discharge, retarding gastric emptying, and regulating gut hormones. Also, they diminish triglycerides and low-density lipoprotein cholesterol concentrations, ameliorate adipose tissue inflammation, and lessen ectopic fat aggregation, fostering total metabolic health. The emergence of dual and triple co-agonists, targeting GLP-1 concomitantly with glucose-dependent insulinotropic polypeptide, and glucagon pathways, may trigger weight dissipation and reduce metabolic rigidity. Unraveling these processes is pertinent as the therapeutic sphere revolves, providing clinicians and researchers insights for the optimization the efficacy of contemporary and future obesity therapies [17].

The pertinence and equitable access of obesity subjects to GLP-RAs globally

Obesity is a chronic, relapsing disorder affecting more than 1 billion persons globally, with pronounced morbidity, mortality, and economic burden. Glucagon-like peptide-1(GLP-1 therapies) offer clinically significant weight loss and expansive metabolic advantages. In response to Member State arrangements, the World Health Organization (WHO) presented guideline for obesity adults. Obesity necessitates longterm care and emphasizes prompt diagnosis alongside integrated, individual-focused strategy inculcating behavioural, medical, surgical, and several other interventions in combination with prevention, management and care of sequelae or comorbidities. WHO recommends long-run GLP-1 therapies together with indepth behavioural therapy for the maximisation and sustenance of benefits. The recommendations were accorded conditional, with reflections and perspectives [18] that GLP-1 therapies, in the absence or presence of behavioural therapy-are effective, but paucity of long-term data, cost, system preparedness, equity, variations in patient priorities, and context-specific possibility decisions. Execution of the guideline is dependent on equitable access to affordable medications, health system readiness, and especially assurance that care is individual-centered, devoid of discrimination, and broadly accessible. With the period provided to execute these modalities, a transparent, equitable, evidence-based framework must be prioritised in order to identify persons in utmost need for care while granting incremental eligibility expansion as accessibility, capacity, and preparedness evolve as the proximal emphasis of the WHO guideline.

Thus, medication cannot strictly resolve the worldwide obesity scourge and burden. The availability, accessibility and equitable distribution of GLP-1 therapies ought to stimulate the global community to present equitable, rational, integrated, and sustainable obesity ecosystem [19,20]. Equitable access must be assured not merely for comprehensive disease management and care but for health promotion, improvement and prevention policies including interventions targeting the general populace and persons in grave risk [20,21]. Glucagon-like peptide 1 receptor agonists and combination medications (GLP-1s) are varying the therapy obesity trajectory. Although, real-world challenges and restricted clinician and public information on nutritional and lifestyle interventions can impede GLP-1 efficacy, equitable outcomes, and cost-effectiveness. Objectively, studies have attempted to determine pragmatic opportunities and priorities for nutrition and more lifestyle interventions pertaining to GLP-1 obesity therapeutic measures relevant to the practicing clinician. In trials, GLP-1s have been identified to decrease body weight by 5–18 %, with slightly lower impacts in real-world analyses, with realised clinical benefits. The challenges encountered involved side effects, such as gastrointestinal and nutritional insufficiency as a result of calorie restrictions [22] as well as muscle and bone dissipation [23-26] diminished long-term addiction to subsequent weight reimbursement and elevated costs with resultant decreased cost-effectiveness. Multiple practice guidelines offer recommendations for multi-ingredient evidence-based nutritional and behavioural treatment for obesity adults, however, usage of such therapies in

combination with GLP-1s is not commonplace. Therefore, it is pertinent to emphasis (I) patient-centered commencement of GLP-1s, targeting health and weight decrement; (ii) baseline screening, inculcating normal dietary habits, emotional triggers, anomalous eating, and pertinent medical presentations; (iii) total examination encompassing muscle strength [23-26], functionality, and body composition monitoring and evaluation; (iv) social determinants of health screening; (v) and lifestyle and well-being assessment regarding aerobic activity, strength exercise and training, sleep, mental stress and disruptions, substance abuse, social associations, and peer pressure. While using GLP-1, nutritional and medical regulations of gastrointestinal side effects as well as modified dietary patterns and intakes, preventing nutrient deficiencies, preservation of muscle and bone mass via resistance training, resilience and essential diet, as well as complementary lifestyle interventions are crucial. Emerging spheres for future study need dietary embrace endogenous GLP-1 modulation, modalities for the improvement of compliance, nutritional considerations for post-cessation weight maintenance, combined or presented intensive lifestyle management, and criteria for diagnosis in clinical obesity. Evidence-based nutritional and lifestyle approaches constitute vital functionalities in combating challenges associated with GLP-1 obesity treatment, pushing clinicians to be more effective in improving the outcome of the health of patients [20,21].

Public Health in the epochal manifestation of GLP-1 Receptor Agonists

Public health provides safe and equitable distribution, administration and delivery of GLP-1 drugs by attending to systemic challenges, issues, opportunities and priorities, where responsibilities inculcate defining clinical guidelines, driving global supply deficiencies, confronting counterfeit markets, and executing population-level monitoring and evaluation for long-run safety and cost-effectiveness [27]. Public health needs to shift its emphasis from merely treatment of the symptoms of obesity and type 2 diabetes to management of the systemic impacts of GLP-1 receptor agonists, for instance, Ozempic and Wegovy. The pivotal functions must ensure equitable access and distribution of medications, establishment and implementation of guidelines for long-term usage, monitoring and evaluation of emerging and reemerging side effects, and integration of the medications into wider wellness modalities The exorbitant cost and supply restrictions of GLP-1 receptor agonists (GLP-1 RAs) constitute dire public health challenges and issues. In the absence of targeted interventions, these significantly potential therapeutic measures will absolutely ab initio benefit affluent populations, and exacerbate extant health differentials. Agencies of public health have the fundamental functionalities in advocating and soliciting for affordability through the development of policies which navigate and negotiate fair and justifiable pricing and ameliorate out-of-pocket costs for marginalized or uninsured groups.

Prioritising the distribution of these drugs through the establishment of clinical guidelines, following the World Health Organization trajectory to make assurance medicines are allocated to deserving patients in dire need. A provision of long-term safety and surveillance is relevant as constitute lifelong therapies for multiple public health systems which must monitor and evaluate greater epidemiological efforts and impacts. Pharmacovigilance in tracking uncommon or long-term excruciating impacts on a population scale becomes pertinent via label expansion. The monitoring of the emerging usage of GLP-1s for non-conventional stipulations, such as substance abuse anomalies and neurodegenerative disorders. In the application of Multimodal Care and Prevention, public health professionals stress that GLP-1s constitute tools rather than an overwhelming cure for systemic metabolic anomalies. Public health responsibilities encompass the integration of lifestyle support by designing programmes which unify these medications with physical training and nutritional interventions for the preservation of lean muscle mass [23-26] and ensuring sustainability [28] in weight management and care. The sustenance and maintenance of foundational prevention enhances continual neighborhood support and efforts concerning diet, training, exercise, and built-environment advances to impede the upstream root aetiologies of obesity and type 2 diabetes.

Hallmarks of side-effects and concern on GLP-1 medications

Glucagon-like peptide-1 (GLP-1) receptor agonists are classified as injective anti-diabetic agents which improve glycaemic control and several other atherosclerosis-associated parametres in type 2 diabetes (T2D) patients. However, the application of this relatively recent class of medicines could be related with certain adverse impacts. There is concern on the effects of these agents on pancreatic and thyroid tissues in animal research and analyses of GLP-1 receptor agonists' association with pancreatitis, pancreatic and thyroid cancer [29]. However, numerous meta-analyses cannot ascertain a cause-effect correlation between GLP-1 receptor agonists and the presentation of these anomalous developments. A benefit of GLP-1 receptor agonists is that they are not aetiological agents of hypoglycaemia when in combination with metformin or thiazolidinediones, but the dosage of simultaneous sulphonylurea or insulin may need to be reduced to mitigate the risk of hypoglycaemic events. Conversely, numerous reported cases have associated the consumption of these drugs, especially exenatide, with acute kidney damage, essentially through haemodynamic degradation resulting from nausea, vomiting, and diarrhoea. The most frequently associated symptoms with GLP-1 receptor agonists usage are gastrointestinal, mainly nausea. The other frequent adverse resultant impacts are injection site reactions, headache, and nasopharyngitis, however, these impacts do not commonly culminate in disruptions in usage of the medication. Recent indications are that GLP-1 receptor agonists present no adverse effects on the cardiovascular risk of patients with type 2 diabetes. Therefore, GLP-1 receptor agonists apparently present innocuous disposition, however, future trials will monitor and evaluate their cardiovascular impacts [29]. On the whole, the side-effect tracking protocols of GLP-1 drugs depict the most frequent side effects of GLP-1 medications, such as appetite loss, constipation, diarrhoea, nausea, vomiting, abdominal discomfort, bloating, dizziness, and fatigue, which ordinarily present as the body accommodates to the drug impacts on the digestive system.

The worldwide accessibility, availability and demand for GLP-1 therapies have ignited the expansion of counterfeit and substandard products, exposing and threatening patient safety and well-being, while paving the trajectory of diminished trust. Quality assurance requires regulated distribution and prescription by qualified healthcare providers, resilience, strengthened oversight, patient education, and geopolitical cooperation for the protection of public health. During 2026, WHO intends to function abreast pertinent stakeholders to promote and improve development of a clear and equitable prioritisation framework to provide those with the greatest need are identified promptly [13]. WHO defines obesity as presenting a Body Mass Index (BMI) of 30 or greater in adults. GLP-1 receptor agonists are a category of medications which assist to lower blood sugar, undergird weight loss, mitigate the risk of cardiac and renal sequelae, and even diminish the risk of early mortality in type 1 and type 2 diabetes [30]. The guideline offers recommendations particularly for three agents liraglutide, semaglutide and tirzepatide applied in long-run obesity treatment in adults. Dose titration is necessary in starting low and increasing gradually to mitigate gastrointestinal side effects, such as nausea, vomiting, and diarrhoea. GLP-1 side effect monitoring constitute the current approach to track potential adverse reactions due to GLP-1 receptor agonists [31].

Discussion

The framing of the article highlights the socioeconomic factors influencing access to GLP-1 therapies and the ethical spheres of not prioritizing pharmacological interventions more than systemic health improvements, thus, avoiding pharmaceutical monopolies and their impact on health equity. The interdisciplinary potential of the article is considerable, providing insights tending to bridge the lacuna between pharmacology, public health, and global policy [18,19] as well as the scalability of a potentially globally potentially robust GLP-1 RAs.In discussing the challenges, issues, opportunities, priorities and policy alternatives concerning access to glucagon-like peptide-1 (GLP-1) agents in the United States of America, for instance, it is primordial that policymakers and the healthcare leadership ensure affordable, equitable access to GLP-1 medications alongside management of their substantial budget influence on the health system [32]. The expanding function of GLP-1 receptor agonists, emerging therapeutic roles and evidence suggest that GLP-1 RAs are of benefit in the management of numerous disorders and metabolic dysfunctionalities. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have advanced type 2 diabetes and obesity management with benefits greater than glycaemic control, weight dissipation and cardiovascular sustainability.

Notwithstanding their efficacy, access to these medications is inequitably depicted with marginalized groups confronting grave obstacles is due to cost, insurance deprivations and geopolitical variations [24,33]. GLP-1 RAS, with particular reference to Semaglutide is extremely effective and safe to manage type 2 diabetes and obesity but there are several extant inequalities in access which impede racial/ethnic minorities, poor and rural communities globally. The eradication of these impediments through telehealth, policy reforms, and community-based assignments is progressive for health equity. It is pertinent that equal access to GLP-1 RAs presents as a dynamic national public health priority to enable insurance expansion, drug cost decrement, and broadening of telehealth and community-based services are significant levels in shutting the overt lacunae, with progressive outcomes in type 2 diabetes and obesity subjects. The prioritisation of national public health must consider equal access to GLP-1 RAs for the improvement of outcomes and shut lacunae in diabetec and obese persons [24,34,35].

The BALANCE Model intends to augment access to identify GLP-1 therapeutics, healthy well-being and lifestyle interventions [36]. The phase one investigation was scheduled to commence in mid-2026. Poison centres in the USA are recipients of increasing GLP-1 RA exposure reports due to FDA approval for GLP-1 RA usage in weight depreciation [37]. Preliminary study indicated that testosterone concentrations elevate or stabilize in persons on GLP-1 therapies. In 2026, it is expected that glucagon-like peptide-1 (GLP-1) receptor agonists will incessantly expand into new FDA-approved usage. Within the first year, 50%-65% of patients prescribed GLP-1s disrupt therapy, irrespective of the well-established risk for weight reinstatement. Complsints have reached FDA concerning certain compounded GLP-1 drugs being warm or with inappropriate ice packs at recommended temperature. With the increased access or availability of new HLP drugs, recent Gallup data suggest a long-expected reversal: the adult obesity rate [38] lowered from 39.9% in 2022 to 37% in 2025. A new approach to deliver GLP-1 drugs to obesity patients or previously overweight culminated in up to a 12% decrement in body weight, and ameliorated type 2 diabetes ailment [39-42] as well as the scalability of a potentially globally potentially robust GLP-1 RAs.

Conclusion

The multdisciplinary sphere of this review is considerable, highlighting insights to connect the gap between pharmaceuticals, public health, and global policy including the scalability of globally robust GLP-1 RAs. Overall, this review presents a comprehensive narrative of the role of GLP-1 RAs in the treatment of obesity and diabetes, with emphasis on their potential impacts on public health and global health equity. The narrative is structured around the WHO guidelines, providing a strategy focusing on pertinent public health concerns through pharmaceutical interventions. Additionally, the article offers an insightful discourse on the geopolitical implications, especially regarding equitable access to GLP-1 therapies, and its relevance amidst increasing socioeconomic disparities. The theoretical contribution explores the inextricably-linked nature of systemic health disparities and the potentiality for newfangled therapies to transcend conventional spheres in achieving health equity.

The critical responsibilities and strategic emphasis of public health must ensure health equity in curbing the annual expenses of these drugs. Public health servicess must advocate policies which restricted these medications from aggravating extant

socioeconomic and geopolitical health variations. GLP-1 medications are remarkably effective but do not constitute the ultimate solution to obesity and diabetes. Comprehensive and sustainable solutions which address long-term metabolic health and well-being devoid of dependency without setting the stage for crisis that would be more adverse than unprecedented in the future. The article presents the socioeconomic attributes impacting access to GLP-1 therapies and the ethical framework of not placing pharmacological interventions on a higher pedestal than systemic health advancement, thereby, obviating pharmaceutical monopolies and their effectivity on health equity.

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