

RESEARCH ARTICLE

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Assessing Compliance and Challenges in Implementing Smoke-Free Zone Regulations in Indonesia

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Abstract

Objective: Kendari is located in Southeast Sulawesi Province, Indonesia, with an estimated population of approximately 350,000. This study aimed to evaluate compliance with implementation of Kendari City Regulation No. 16 of 2014 on Smoke Free Zones (Perda KTR) across various facilities (public places, workplaces, educational environments, places of worship, healthcare facilities, children's play areas, sports facilities, and public transportation). This study also examines locating smoke advertising installation points around the observation area. **Methods:** This study employs a qualitative approach with a purposive sampling method to select 200 representative locations for observation and 11 informants to assess compliance with Perda KTR between August and September 2023. We evaluated the location regarding the criteria "No Smoking Area" signs, clear "No Smoking" signs, penalties for violators, presence of cigarette butts, designated smoking areas, and tobacco product promotion. The analysis was based on descriptive compliance analyses and QGIS was used to map the distribution of observation locations and tobacco advertising. **Result:** Only 15 of the 200 locations (7,5%) fully complied with the Perda KTR. Healthcare facilities had the highest compliance (40%), followed by educational institutions (33%), while worship places, public transport, and sport facilities showed 6-7% compliance. About 92,5% of "No Smoking" signs lacked enforcement sanctions, and cigarette butts were found in 43,5% of locations. Additionally, 14,5% of sites showed visible tobacco advertisements, especially in the central district (Wua-Wua, Kadia, Kambu). Mandonga, Puuwatu, and Abeli have fewer observed tobacco advertisements, which may reflect different enforcement levels or commercial activity. Interviews revealed moderate public awareness but highlighted significant enforcement gaps. **Conclusion:** The smoke-free zone policy in Kendari has not been effectively implemented. Structural, cultural, and economic factors, limited signage, and weak enforcement contribute to low compliance. Strengthened policy dissemination and enforcement are essential to improving public adherence.

Keywords: Compliance- Smoke-Free Regulation- Tobacco Control- Mapping- Advertisement

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Introduction

Indonesia has the highest smoking rate among Southeast Asian countries, with smoking rates tend to be higher among men. The World Population Review recently reported that approximately 37.9% of Indonesians are tobacco smokers, ranking this country 13th globally [1]. Indonesia also has the highest male smoking rate in the world at 70.5%, while the female smoking rate is 5.3% [2]. Based on the Global Adult Tobacco Survey, the number of adult smokers in Indonesia increased from 60.3 million in 2011 to 69.1 million in 2021. In Southeast Sulawesi only, at least 78% of the population aged ≥ 5 years is categorized as heavy smokers, i.e., consuming more than 60 cigarette sticks per week, resulting in this province being ranked tenth among other Indonesian regions [3]. Smoking is a leading cause of various health problems, including

respiratory, cardiovascular, and cancer.

This situation needs serious government commitment to reduce smoking prevalence due to the adverse effects on individual health and socioeconomic conditions. Indonesia has ratified the WHO Framework Convention on Tobacco Control (FCTC), including a ban on tobacco advertising, promotion, and sponsorship (TAPS). However, the implementation and enforcement of these regulations in Indonesia have been suboptimal [4, 5], as shown by the high exposure to cigarette smoke in some public places, such as workplaces and educational and health facilities. One of the determinants of this increased exposure is the massive advertising, promotion, and sponsorship of tobacco products (i.e., cigarettes) in media, including mass media, outdoor media, and online media [4, 6]. Implementing smoke-free policies in areas has been associated with decreased smoking prevalence

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among people, lower exposure to secondhand smoke, and increased motivation to quit smoking [7, 8].

Perda KTR refers to a regional policy that restricts smoking and the sale and promotion of tobacco products and mandates smoke-free environments in designated public and social facilities. In Southeast Sulawesi, seven districts have already implemented local Smoke-Free Areas (Perda KTR) regulations from seventeen districts, including Kendari City, which has had a Perda KTR No 16 of 2014. This research focuses specifically on Kendari, providing a deep dive into the real-world challenges and effectiveness of the regulation within this unique context. The qualitative methodology, which includes comprehensive observations and interviews, allows for a nuanced understanding of how the regulation is implemented and perceived on the ground. Observing 200 locations across 11 sub-districts, the study offers robust data on compliance with the Perda KTR. The study identifies specific barriers to effective implementation, such as inadequate public awareness and the pervasive presence of tobacco advertisements. These insights are crucial for developing targeted interventions. Utilizing observation data to map compliance across different locations within Kendari City provides a visual and analytical tool to understand spatial patterns in adherence to the Perda KTR. This geographic analysis can inform more targeted and efficient enforcement strategies.

This study aimed to assess compliance with implementing the Kendari Regent's Regulation on Smoke-Free Zones (Perda KTR) in various facilities included in the Kendari City KTR. These facilities include public places, workplaces, educational environments, places of worship, healthcare facilities, children's play areas, sports facilities, and public transportation. Additionally, the study examined the location of cigarette advertising installation points around the observation area.

Materials and Methods

This study uses direct observation and brief interviews to assess compliance with Kendari City's Smoke-Free Area Regulation (Perda KTR) in designated areas. Additionally, it documents cigarette advertising locations to understand potential advertising influence. Compliance with the Kendari City Smoke-Free Area Regulation (Perda KTR) was assessed using a checklist that included the following items: Presence of individuals smoking in the observation area; Presence of "No Smoking" signs (image of a lit cigarette with smoke in a red circle with a cross); Presence of "Smoke-Free Area" signs at entrances; Presence of cigarette butts at the location; Inclusion of smoking prohibition sanctions on "No Smoking" signs; Presence of designated smoking areas (for public places and workplaces); Presence of sponsor logos or cigarette industry names at the location

Time and Location of The Study

The study was conducted from August to September 2023 in Kendari City, Southeast Sulawesi. Observations and interviews were carried out across 11 sub-districts within the city (Mandongga, Kendari, Baruga, Poasia,

Kendari Barat, Abeli, Wua Wua, Kadia, Puuwatu, Kambu, Nambo).

Population and Sample

The population for this study includes all locations categorized as KTR in Kendari City, which encompass public places, workplaces, educational environments, places of worship, healthcare facilities, children's play areas, sports facilities, and public transportation. A purposive sampling method was used to select 200 representative locations for observation and 11 informants.

Data Collection Techniques

Data were collected through direct observations and brief interviews. Observations were conducted at 200 locations across 11 sub-districts. Each location was evaluated for compliance with the Perda KTR using specific criteria: Presence of "No Smoking Area" signs at entrances; Visibility of clear "No Smoking" signs with a lit cigarette and a circle with a slash; Inclusion of penalties for violators on the main entrance signs; Presence of cigarette butts within the observation area; Presence of cigarette butts within the observation area; Designation of specific smoking areas (for public places and workplaces); Presence of any form of tobacco product promotion, advertisement, or sponsorship inside or outside the location (e.g., posters, banners, stickers, table mats, tissue holders); Presence of individuals selling cigarettes or other tobacco products within or around the observation area.

The interviews were conducted with 11 informants at the observation sites, which included local authorities, facility managers or owners, members of the general public who visited the facilities, and local community leaders to gather insights on Knowledge of the Perda KTR, Preferred smoking areas and reasons for these preferences, Implementation of the Perda KTR in Kendari City, Expectations and suggestions for the Perda KTR in Kendari City.

Data Analysis

Data were collected and input using KoboToolbox, which included recording the geographical coordinates of observation locations and points where tobacco advertisements were seen along major roads. The data were then analyzed using QGIS to map the distribution of observed locations and tobacco advertisement points and to conduct a descriptive analysis of compliance and interview responses.

Ethical Approval

This study was conducted following ethical guidelines and received approval from the Halu Oleo University Ethics Committee with the approval number 3662a/UN29.20.1.2/PG/2023

Results

Facility Compliance Overview

Table 1: The study observed 200 locations across various categories in Kendari City to evaluate compliance

with the Smoke-Free Area Regulation (Perda KTR). The observed locations included public places (35), workplaces (32), educational environments (29), places of worship (28), healthcare facilities (25), children's play areas (20), sports facilities (16), and public transportation (15).

Only 15 out of 200 observed locations (7.5%) demonstrated full compliance with the regulation, which was defined by the presence of appropriate signage, the absence of cigarette butts, and no observable smoking activity. Healthcare facilities (40%) and educational institutions (33%) had the highest compliance rate. In contrast, compliance in worship places, transport facilities, and sports venues was 6-7%.

Table 2: The findings reveal significant gaps in compliance with the Smoke-Free Area Regulation. Despite existing regulations, individuals were observed smoking in 65 locations, indicating persistent non-compliance with smoke-free policies. Only 52 locations displayed "No Smoking Area" signs at entrances, leaving 148 locations without any visible deterrents. Furthermore, only 45 locations had clear "No Smoking" symbols with a lit cigarette and a red circle with a slash, while 155 locations lacked these essential visual cues. The lack of penalty indications was even more striking, with only 15 locations mentioning penalties for smoking violations and 185 locations failing to provide such information. This absence of clear deterrents likely contributes to the observed non-compliance.

The prevalence of cigarette butts in 113 locations, compared to 87 locations where no cigarette butts were found, further illustrates inadequate enforcement of smoke-free policies. Designated smoking areas were scarce, with only 8 locations having specific areas for smoking applicable to public places and workplaces, while 192 locations did not provide such designated areas. This lack of designated smoking zones may force smokers to violate smoke-free regulations out of necessity or convenience.

Tobacco product promotions, advertisements, or sponsorships were found in 29 locations, suggesting that the visibility of tobacco products remains a significant issue. The pervasive presence of tobacco advertising undermines smoke-free initiatives by normalizing smoking and making it more attractive, particularly in areas where such promotions are explicitly prohibited. Additionally, 91 locations had individuals selling cigarettes or other tobacco products, posing another challenge to the effectiveness of the smoke-free regulation. The easy accessibility of tobacco products within or around these locations contradicts the goals of the Perda KTR and perpetuates smoking behaviors.

Stakeholder Perspective

Interviews with 11 informants revealed insights into the public's perceptions of the Smoke-Free Area Regulation (Perda KTR) in Kendari City. Most informants had a basic understanding of Smoke-Free Areas (KTR), recognizing them as zones where smoking is prohibited. However, some informants lacked detailed knowledge or held varying interpretations of the policy, indicating gaps

in public education and awareness efforts.

"Further efforts are needed to inform the public about this policy so that more people will be aware of and comply with the regulations" (Wati).

Regarding permissible smoking locations, informants generally agreed that smoking should not be allowed in enclosed spaces such as buses, public transport vehicles, and schoolrooms. Nevertheless, there was a perception that smoking in open spaces might be permissible with certain restrictions. This suggests a need for more straightforward communication about the specific areas the KTR covers and the rationale behind these restrictions to avoid ambiguities.

"Smoking should only be done in designated open facilities for smokers and not indiscriminately in public places" (Sukir).

The informants generally believed that while the Kendari City government had established KTR policies, implementing and disseminating these policies had not been optimal. Many informants felt that the policies had not been effectively enforced, attributing this to insufficient public awareness and weak law enforcement. The lack of consistent and visible enforcement measures likely contributes to the ongoing violations of the smoke-free regulations observed in the study.

"There is a 'No Smoking' sign in the hospital, yet people are still smoking in that area... the government should impose penalties on those who violate the smoking ban in smoke-free areas." The lack of consistent and visible enforcement measures likely contributes to the ongoing violations of the smoke-free regulations observed in the study.

The community also voiced their expectations for the government to enhance the dissemination of KTR policies so that more people would understand and comply with the regulations. There was a strong call for stricter enforcement and a more robust commitment from the government to make Kendari a healthy, smoke-free city, particularly in public places. This reflects a desire for more proactive measures from local authorities to ensure the policies are well-publicized and rigorously enforced.

Tobacco Advertisement Mapping

From Figure 1, the map visually represents the distribution of observed locations across Kendari City

Table 1. Mapping of 200 KTR Locations in Kendari City

Characteristics	Frequency (n)	Percentage (%)
Location		
Public places	35	18
Workplaces	32	16
Educational environments	29	15
Place of worship	28	14
Healthcare facilities	25	13
Children's play areas	20	10
Sport facilities	16	8
Public transportation	15	8
Total	200	100

Source, Primary Data, 2023

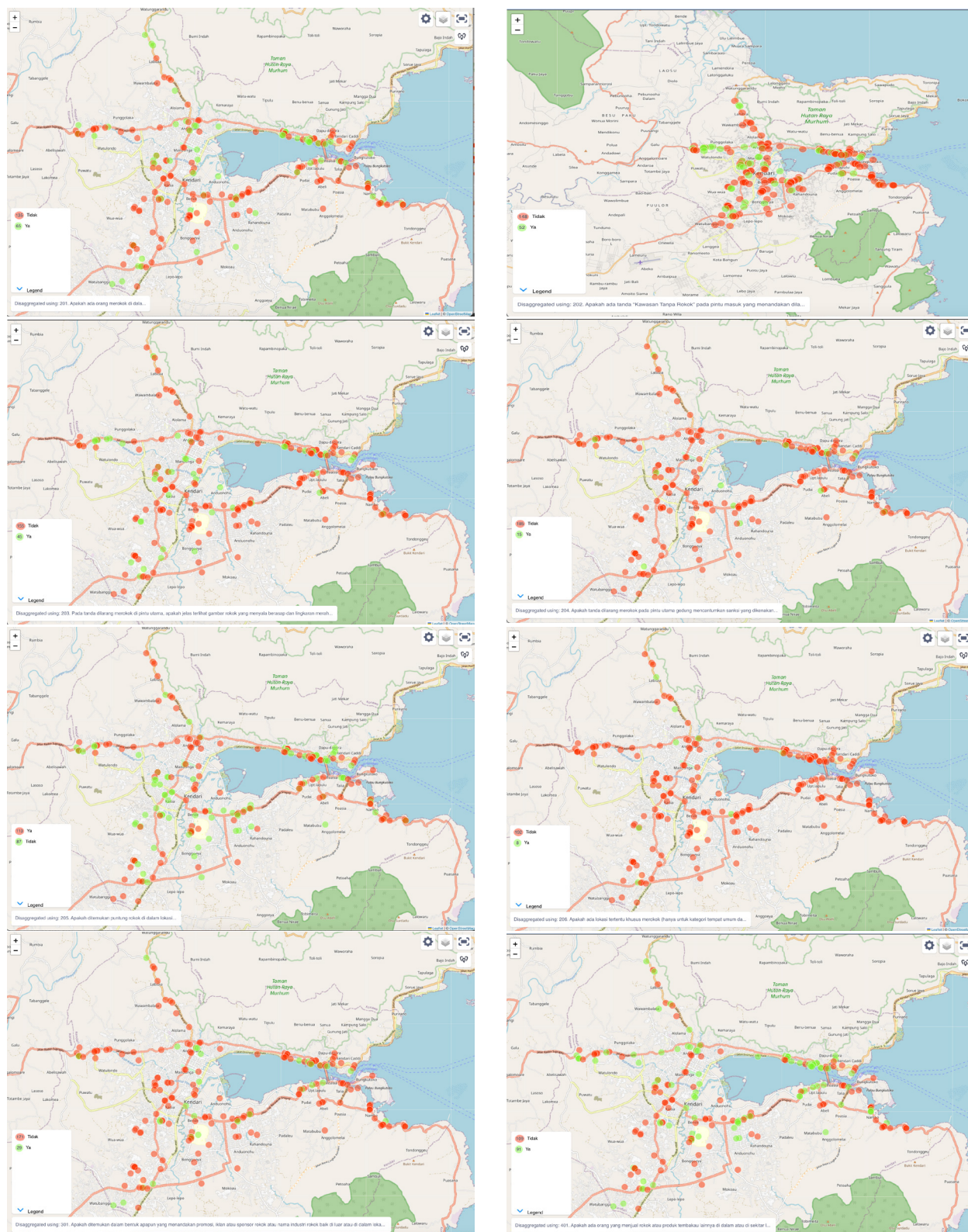


Figure 1. KTR Observation Locations in Kendari City. 201: Presence of individuals smoking at the observation site 202: Presence of a 'No Smoking Area' (KTR) sign at the entrance; 203: 'No Smoking' sign includes a graphic of a lit cigarette with smoke and a red circle (universal no-smoking symbol); 204: 'No Smoking' sign includes a statement on applicable sanctions or penalties; 205: Cigarette butts found at the observation site; 206: Designated smoking area available; 301: Presence of tobacco advertising, promotion, sponsorship, or tobacco industry branding; 401: Presence of cigarette vendors or sales nearby.

Footnote for the Figure 1: Red circles indicate observation locations that failed to meet one or more key smoke-free area (KTR) compliance criteria. These may include the presence of individuals smoking (201), absence or inadequacy of 'No Smoking' signage at entrances (202), lack of proper warning graphics such as a red-circled smoking symbol (203), or missing information on sanctions (204). Other non-compliant indicators include the presence of cigarette butts (205), lack of designated smoking areas (206), visible tobacco promotion or sponsorship (301), and cigarette vendors near the area (401). Green circles indicate full compliance with local smoke-free regulations (Perda KTR), typically marked by the presence of appropriate 'No Smoking' signs (with standard symbol and sanctions), and the absence of smoking activity, cigarette butts, tobacco advertisements, or cigarette vendors at or near the location.

concerning the presence or absence of “No Smoking” signs. Presence of “No Smoking Area” signs at entrances; Visibility of clear “No Smoking” signs with a lit cigarette and a circle with a slash; Inclusion of penalties for violators on the main entrance signs; Presence of cigarette butts within the observation area; Presence of cigarette butts within the observation area; Designation of specific smoking areas (for public places and workplaces); Presence of any form of tobacco product promotion, advertisement, or sponsorship inside or outside the location (e.g., posters, banners, stickers, table mats, tissue holders); Presence of individuals selling cigarettes or other tobacco products within or around the observation area.

The red circles indicate locations where criteria were absent, while the green circles denote locations with these signs displayed.

The map displays widespread observations across Kendari City, covering central urban areas and the outskirts. This broad coverage indicates a comprehensive effort to assess compliance in diverse environments and neighborhoods. Green circles are dispersed throughout the map, marking locations that adhere to regulations by displaying “No Smoking” signs. However, the number of green circles is considerably fewer than the red ones. Clustered green circles suggest higher compliance in certain areas, likely due to more effective enforcement

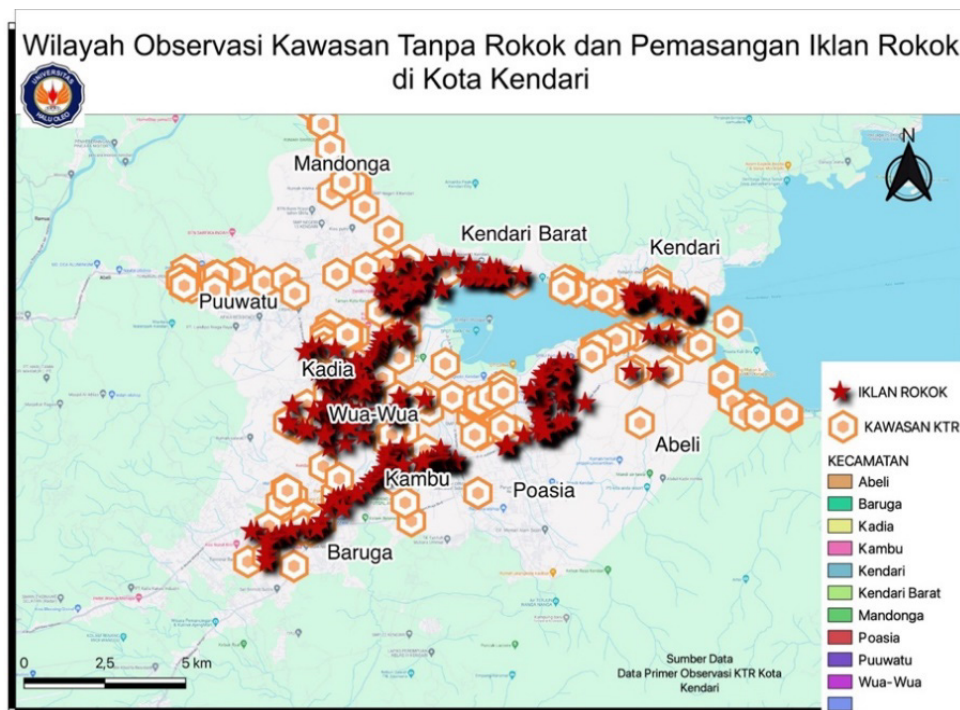


Figure 2. KTR Observation Areas and Tobacco Advertising Location in Kendari City. Source, Primary Data, 2023

Table 2. KTR Observations in Kendari City. Source, Primary Data, 2023

Observation	Frequency (n)		Percentage (%)	
	Yes	No	Yes	No
Perda KTR Criteria				
Presence of smokers within the observation area	65	135	33	68
Presence of "No Smoking Area" signs at entrances	52	148	26	74
Visibility of clear "No Smoking" signs with a lit cigarette and a circle with a slash	45	155	23	78
Inclusion of penalties for violators on the main entrance signs	15	185	8	93
Presence of cigarette butts within the observation area	113	87	57	44
Designation of specific smoking areas (for public places and workplaces)	8	192	4	96
Presence of any form of tobacco product promotion, advertisement, or sponsorship inside or outside the location (e.g., posters, banners, stickers, table mats, tissue holders)	29	171	15	86
Presence of individuals selling cigarettes or other tobacco products within or around the observation area	91	109	46	55

or heightened awareness.

Red circles, indicating non-compliance, predominate and are especially conspicuous along major roads and intersections. This suggests that public spaces and area with high pedestrian traffic are not adequately observing smoke-free regulations. The high concentration of red circles in both central and peripheral regions demonstrates that the issue of non-compliance is widespread and not confined to any specific part of the city.

Some peripheral areas show fewer observations, which could indicate either fewer public spaces being monitored or better compliance in those regions. The significant number of non-compliant locations presents a substantial challenge for public health efforts aimed at reducing smoking prevalence and secondhand smoke exposure. The visual data from the map underscores the need for targeted interventions to enhance compliance with the Smoke-Free Area Regulation (Perda KTR), particularly in identified non-compliance hotspots.

Additionally, clusters of green circles indicate locations accessible from tobacco product promotions, but these are less frequent and scattered across the city. The limited presence of green circles suggests that tobacco product promotions are not widespread but still occur in specific areas. The presence of these green circles where tobacco product promotions, advertisements, or sponsorships are visible can undermine public health efforts to reduce smoking prevalence and exposure to tobacco marketing. Areas with a higher concentration of green circles might require targeted interventions to improve adherence to regulations against tobacco promotions and increase public awareness.

Figure 2: The image is a detailed map of Kendari City, depicting the observed Perda KTR areas and tobacco advertisements' locations. The map uses hexagons to mark KTR zones and stars to indicate locations of tobacco advertisements. The hexagons are widely distributed across the city, covering all significant districts such as Mandonga, Puuwatu, Kadia, Wua-Wua, Kambu, Baruga, Poasia, Abeli, and Kendari Barat. This widespread distribution suggests an extensive implementation of the KTR policy across the city, aiming to create numerous smoke-free areas.

The red stars representing tobacco advertisements are heavily clustered in certain areas, particularly in the central and more populated districts such as Kadia, Wua-Wua, and Kambu. This high concentration of tobacco advertisements in central areas highlights the challenge of enforcing KTR regulations where commercial activities are dense, and tobacco promotions are more likely to be visible. The west and central parts of Kendari City, particularly around Wua-Wua, Kadia, and Kambu districts, show a high density of KTR zones and tobacco advertisements. Peripheral areas such as Mandonga, Puuwatu, and Abeli have fewer red stars, indicating fewer observed tobacco advertisements, which may reflect different enforcement levels or commercial activity.

Discussion

These findings highlight several underlying issues.

First, the insufficient visibility and clarity of “No Smoking” signs and penalties likely reduce their effectiveness as deterrents. Second, the lack of designated smoking areas forces smokers to disregard smoke-free policies. Third, the widespread presence of tobacco advertising and sales indicates a failure to fully enforce existing regulations. There is a general lack of awareness about the specifics of the Perda KTR, including its existence, the details of its restrictions, and the associated penalties for non-compliance. This lack of knowledge undermines the creation of a smoke-free environment [9]. The limited presence of enforcement officers and resources dedicated to monitoring compliance contributes to widespread non-adherence to the regulations. Without consistent enforcement, individuals and businesses may not feel compelled to comply [10]. In many parts of Indonesia, smoking is deeply ingrained in social and cultural practices. This makes it challenging to change behaviors and attitudes towards smoking, especially in public places [11]. The tobacco industry has a significant economic impact, and local businesses may resist the strict enforcement of smoke-free regulations due to the potential loss of revenue from tobacco sales and advertising [12, 13]. There may be a lack of firm commitment from local authorities to prioritize and enforce smoke-free policies effectively. This can result in weak implementation and oversight of the regulations [14]. Addressing these issues requires a multifaceted approach that includes increasing public awareness, enhancing enforcement mechanisms, providing designated smoking areas, and reducing the visibility and accessibility of tobacco products. By tackling these challenges, Kendari City can make significant strides towards creating a healthier, smoke-free environment.

While there is a general understanding of smoke-free zones, some individuals lack detailed knowledge about the specifics of the KTR policy. This indicates a need for enhanced public education efforts to ensure comprehensive awareness and understanding of the regulations [5, 15]. The mixed perceptions regarding permissible smoking locations, particularly the belief that smoking might be allowed in open spaces with restrictions, highlight the need for more straightforward communication about the designated smoke-free areas and the reasons behind these restrictions [5]. The perceived inadequacy in implementing and disseminating KTR policies by the Kendari City government points to a significant gap in policy enforcement. The informants' feedback suggests that insufficient public awareness and weak law enforcement are substantial barriers to effective policy implementation [5, 16]. There is a clear expectation from the community for the government to improve the dissemination of KTR policies and enhance enforcement measures. The strong call for stricter enforcement and proactive measures reflects the community's desire for a healthier, smoke-free environment in Kendari City.

Many locations throughout Kendari City appear unaware of the regulation or the importance of displaying “No Smoking” signs, highlighting the need for more robust public education and awareness campaigns. The prevalence of red circles on the map suggests that

enforcing the Smoke-Free Area Regulation (Perda KTR) is inadequate. Compliance is likely to remain suboptimal without consistent monitoring and the implementation of penalties for violations. In many parts of Indonesia, smoking is culturally ingrained, making it socially acceptable to smoke in public places. Addressing this normative behavior requires sustained public health interventions [16, 17].

The resistance from businesses that sell tobacco products may also contribute to ongoing non-compliance, as strict enforcement of smoke-free regulations could impact their sales negatively. This resistance could undermine efforts to reduce smoking in public areas. Additionally, cigarette butts, which contribute to pollution and harm wildlife, indicate ongoing smoking in prohibited areas. Areas with a higher concentration of red circles might necessitate targeted interventions to decrease smoking prevalence, enhance adherence to smoke-free regulations, and tackle issues related to littering [16, 18].

The low compliance rate (7.5%) highlights significant implementation gaps. Despite signage in some locations, their ineffectiveness is evident from the frequent presence of smokers and cigarette butts. Facilities with higher compliance (healthcare, education) likely benefit from more vigorous institutional enforcement or awareness. Meanwhile, central districts with intense advertising face enforcement resistance due to economic interests. The thematic analysis of interviews and FGDs confirms weak enforcement, limited public knowledge, and stakeholder reluctance especially among business owners—due to fear of losing customers. Similar challenges in enforcing of smoke-free policies were also reported in Jambi Regency, where the lack of socialization and budget support hindered school compliance [15].

There is also a potential lack of awareness among property owners and managers regarding the significance of clear “No Smoking” symbols and their role in enforcing smoke-free policies. Some locations may lack the resources to procure and install such signage, indicating a need for support or incentives to ensure compliance. Moreover, the absence of designated smoking areas and proper disposal facilities for cigarette butts can exacerbate the problem of littering, suggesting that providing these facilities could help mitigate the issue [19, 20].

Furthermore, businesses might prioritize revenue from tobacco advertisements and sales over compliance with regulations, especially in commercial and high-traffic areas. The presence of a few green circles suggests that enforcement against tobacco promotions and sales is insufficient. Without consistent monitoring and penalties for violations, individuals and businesses might continue to display tobacco advertisements and sell tobacco products, further complicating the enforcement of smoke-free policies [10, 21].

The coexistence of KTR zones and tobacco advertisements illustrates a conflict where the presence of tobacco promotions potentially undermines smoke-free policies [9]. This situation may diminish the effectiveness of KTR zones in fostering smoke-free environments. The substantial number of advertisements within designated KTR zones presents significant public

health challenges, potentially normalizing smoking behaviors and undermining efforts to reduce smoking prevalence and secondhand smoke exposure [16, 18]. The frequency of tobacco advertisements within KTR zones indicates that enforcing advertising restrictions is inadequate. The lack of robust enforcement allows businesses to flout regulations continually. Moreover, there might be insufficient public awareness regarding the adverse impacts of tobacco advertisements and the critical role of maintaining smoke-free zones. Enhancing public education could bolster compliance and diminish the visibility of such advertisements [22].

These findings align with national challenges observed in other cities implementing Perda KTR, where cultural norms and lack of policy ownership hinder outcomes. Effective enforcement requires community participation, resource allocation, and cross-sectoral commitment. The coexistence of tobacco promotion and KTR signs reflects a regulatory contradiction that weakens public health messaging. At the district level, local government often faces political and structural barriers, such as the absence of national bans on tobacco advertisement and a heavy reliance on tobacco tax revenue, which hinder the comprehensive implementation of tobacco control policies [23].

Conc: This research on implementing the Smoke-Free Area Regulation (Perda KTR) in Kendari City has revealed significant challenges in compliance and enforcement. Despite legal frameworks, practical enforcement remains weak, with only 7.5% of facilities fully compliant. Contributing factors include insufficient signage, lack of designated smoking areas, widespread tobacco advertising, and weak public education. The coexistence of KTR zones and tobacco advertisements presents a major regulatory contradiction, particularly in central and commercially dense districts, highlighting the need for a targeted approach in these hotspots. Strengthening enforcement, ensuring consistent public messaging, and addressing economic and cultural barriers are critical to improving policy outcomes. This study contributes empirical insights into the real-world challenges of tobacco control implementation in an urban Indonesian setting.

Author Contribution Statement

S Engaged in the conception and design of the study, SS (Corresponding Author) contributed to the acquisition of data, analysis, and interpretation and was involved in drafting the manuscript. SP Assisted in data collection and provided critical revisions for the intellectual content. AA played a role in the critical review, commentary, or revision, including pre or post-publication stages.

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Ethical Declaration

This study followed ethical guidelines and received approval from the Halu Oleo University Ethics Committee with the approval number 3662a/UN29.20.1.2/PG/2023.

Conflict of Interest

The authors reported no potential conflict of interest.

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