DOI : https://doi.org/10.58233/3UgK31KD

Shifting wine consumption trends (2019–2024): market dynamics, sustainability, and consumer preferences

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Abstract. This study examined the evolution of wine consumption trends from 2019 to 2024, analyzing market dynamics, sustainability preferences, and generational shifts in consumer behavior. Analyzing survey data from 32,800 consumers in seven wine markets, three major trends were identified: (1) a structural decline in habitual wine consumption after the pandemic, especially among the elderly population; (2) a generational shift in wine consumption habits and preferences with Millennials remaining the core consumers, while Generation Z growing interests in low-alcohol wine; and (3) a shift in sustainability priorities from environmental issues to comprehensive socioeconomic values. The study also revealed contradictory trends in the awareness of EU quality and origin certification before and after pandemic, with Generation Z possessing a relatively high level of knowledge through whole period. Lastly, there was a permanent shift in purchasing channels, with supermarkets declining significantly in popularity and e-commerce stabilizing in popularity after the pandemic. The findings suggest that wineries should adapt to the digital preferences and health values of younger consumers while addressing price sensitivity through innovative product development and marketing strategies. For policymakers, supporting climate-resilient viticulture and regulating sustainability claims have become key priorities to maintain consumer trust in a rapidly evolving market.

1. Introduction

The global wine industry has a strong tradition and cultural heritage and has undergone profound changes in the past two decades. Global wine consumption volume has stagnated since 2008 and begun to decline consistently since 2017 [1]. Despite this, its market value continues to rise. This may be partly attributed to premiumization, that is, consumers are increasingly favoring higher-priced, quality-focused wines instead of buying in bulk [2]. Today, more and more people start to reduce alcohol intake to pursue a healthy lifestyle, driving dealcoholized wine industry to expand rapidly. According to IWSR, the alcohol-free wine and low-alcohol wine industries have grown at annual rates of 13% and 21% respectively in the five years to 2023 [3]. Furthermore, different markets show different consumption trends. For instance, sales in traditional wine countries such as France, Spain, and Italy have been declining, possibly due to aging populations and changing cultural attitudes towards alcohol [4]. In contrast, New World wine markets such as the United States, Canada, and Australia have experienced growth, which may be attributed to young, affluent demographics and innovative marketing strategies [4]. While Asia and Eastern Europe have become key growth regions, one of the reasons could be the socio-cultural prestige and hedonistic appeal of wine consumption, which symbolizes modernity and affluence [5]. This difference highlights the fragmentation of the global market with mature economies struggling with saturation, while emerging regions offering untapped potential despite challenges related to cultural integration and economic volatility.

To explore these transformations in greater depth, this introduction is divided into five subsections: 1.1 examines the generational shift in consumer preferences, 1.2 discusses the growing importance of sustainability, 1.3 analyzes the COVID-19 pandemic's accelerating impact on industry trends, 1.4 explores the growing uncertainty in the wine market, and 1.5 outlines the aims of this study.

1.1. Generational shift reshaping the market

Central to these shifts in consumer markets are evolving consumer preferences, particularly as Millennials and Gen Z consumers move into the core of the consumer market.

In Europe and North America, Millennials and Gen Z consumers are driving demand for lighter, more diverse wines, including sparkling, rosé, and non-alcoholic wines, as they better fit into a casual, health-conscious lifestyle [6,7]. While digital-native consumers are using social media to discover products, with platforms such as Instagram and TikTok bringing sustainable features such as organic certification and eco-friendly packaging to the attention of a new generation of consumers [8]. Older groups, on the other hand, are less interested in sustainable wines than younger generations [9]. This generational bias in preferences means that producers must adapt to consumer preferences actively if they want to thrive in the long term, or risk obsolescence.

1.2. Sustainability becoming necessity

Climate change has also played a major role in the industry's transformation, altering production patterns and strengthening the environmental responsibility of stakeholders. Rising temperatures threaten traditional grape-growing regions, forcing growers to plant drought-tolerant crops or move to cooler climates [10]. At the same time, the industry is under pressure to align with the green economy, with stakeholders from vineyards to retailers embracing circular economy, carbon neutrality, and biodiversity initiatives [11]. Consumer demand for transparency has turned certifications such as organic and biodynamic into a competitive advantage, while the promotion of "eco-friendly" brands on social media has reshaped consumer purchasing behavior [8]. However, the promotion of sustainability is not without its challenges. Smaller producers often find it difficult to afford certification costs, while larger conglomerates face accusations of "greenwashing." Balancing ecological responsibility with economic viability therefore remains a key challenge.

1.3. The COVID-19 accelerating change

Another major factor in the industry's transformation has been the pandemic. Lockdown measures initially triggered a surge in home consumption, with retail wine sales soaring as dining venues closed [12]. However, the post-pandemic recovery has been uneven. While premium wine sales remain strong, the lower-priced wine market faces inflationary pressures and headwinds from excess inventory [7]. The crisis has also highlighted demographic divides, with younger, educated consumers and women experiencing a greater shift in drinking habits, with a greater focus on quality over quantity [13,14]. In addition, the pandemic has accelerated the development of e-commerce sales channels, with online wine purchases doubling in major markets between 2020 and 2022 [15]. This digital shift, coupled with hybrid working models, has redefined the social context for wine consumption, with people preferring intimate family gatherings over formal occasions, however, whether this trend can continue remains a question.

1.4. Uncertainty of wine market future

The post-pandemic era has ushered in heightened volatility, with inflation, supply-chain disruptions, and geopolitical conflicts complicating recovery. Proposed U.S. tariffs on European wines, a lingering threat since the Trump administration, could exemplify these challenges. Such measures could cost Italian and French producers one billion euro annually, while reshaping global trade flows toward Australian and South American exporters [2]. Meanwhile, Asian markets, particularly China and Japan, present both opportunity and risk, as producers contend for dominance in regions with nascent wine cultures [5]. Climate change further compounds uncertainty, with wildfires, floods, and erratic harvests prompting calls for resilient agricultural practices. In this fragmented landscape, agility and diversification are paramount.

However, since the end of the pandemic, the wine industry has been in crisis, with inflation, supply chain disruptions and geopolitical conflicts complicating recovery. The US's proposed tariffs on European Union wines are likely to pose a big threat to the import and export industries. It was estimated that high tariffs could cost Italian and French producers €1 billion a year, while also reshaping global trade flows to Australian and South American exporters [2]. The Asian market, especially China and Japan, presents both opportunities and risks as producers contend for dominance in emerging wine culture regions [5]. Climate change has further exacerbated uncertainty, with wildfires, floods and unstable yields prompting calls for more resilient agricultural practices. In this fragmented landscape, agility and diversification are essential.

1.5. Study aims

This study aims to comprehensively analyze evolving wine consumption patterns from 2019 to 2024 by investigating consumer shifting purchasing habits, sustainability preferences and generational shifts in consumer behavior. The research aims to provide industry stakeholders with practical insights to help them adapt to the post-epidemic market reality, optimize product offerings for emerging consumer segments, and develop targeted marketing strategies. Ultimately, these findings will provide producers and marketers with evidence-based tools to help them respond to market transformation, seize growth opportunities, and promote the sustainable development of the global wine industry.

2. Survey

This study conducted online surveys to consumers on wine consumption habits and preferences for six consecutive years from 2019 to 2024 in seven wine markets (China, France, Germany, Japan, Italy, the UAE and the US), with a total of 32,800 respondents. The study adhered to the principles of the Declaration of Helsinki, and the only requirement for participating in the survey was that the participants had to be at least 18 years old at the time they were surveyed. These seven markets accounted for nearly 51% of the global wine market share in 2019 [16]. These markets were selected to fully reflect the dynamics of global wine, with France and Italy representing traditional Old World wine producers, but domestic consumption is declining. The US and Germany represent vibrant New World growth markets and are showing a trend towards premiumization. China and Japan, on the other hand, represent Asia's rapidly developing wine culture, where consumption blends identity with local tastes. The UAE, as an emerging luxury market driven by tourism and expatriate demand, provides a unique perspective. The diverse selection allows this study to provide a more comprehensive insight into how the global wine market is developing against the backdrop of changing consumer preferences, sustainability issues and macroeconomic pressures by considering different cultural attitudes towards wines, the impact of economic factors and different regulatory environments on purchasing behavior.

Table 1 provides a comprehensive overview of the question categories and sub-categories included in the survey. The survey covers four thematic sections: (1) socio-demographic characteristics (age, gender, income, occupation and country of residence); (2) consumption habits and preferences (frequency of consumption, preferred alcohol content, purchase channel and country of origin preference); (3) perception and evaluation of EU quality and origin certification, i.e., Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI); and (4) concern about sustainability and climate change (interest in sustainable wines, importance of sustainable practices and climate-related consumption shifts).

Table 1. Online survey question framework

Category	Sub-categories
Socio-demographics	Age, gender, residing country, occupation, income level
Consumption habits & preferences	Habitual wine consumption, preferred alcohol content, primary purchase channels (retail/online/hospitality), buying frequency by wine type, preferred country of origin
EU quality and origin certifications	Awareness of EU origin and quality certifications, willingness-to-pay (WTP) premiums for certified wines
Sustainability & climate change	Interest in sustainable wines, prioritized sustainability attributes (e.g., organic, carbon-neutral), perceived impact of climate change on consumption choices

Table 2 below shows the sample socio-demographic characteristics for each year of survey. In 2019, Millennials and women made up the majority, with middle-income respondents being the most common. By 2020, while Millennials still dominated, the proportion of female respondents increased to 72%, and high-income respondents were the most common. The 2021 sample shows that Millennials and Generation X were the main groups, and the gender distribution was also basically balanced (52% women and 48% men). In 2022, Generation X reached the highest proportion of respondents, while Millennials remained strong. In 2023, Millennials rebounded to more than half of the respondents, with middle-income respondents and female respondents making up the majority of the groups. The 2024 sample maintained similar proportions, with Millennials and women continuing to dominate, while the proportion of low-income respondents increased to 28%. Across all years, Gen Z and Boomers remained the minor groups with Boomers gradually fading from the stage, and being employed in a non-management position remained the most common occupation.

Table 2. Sample demographic characteristics by year (2019–2024)

Demographic category	Subgroup	2019	2020	2021	2022	2023	2024
Generation	Gen Z (18–26)	2%	2%	4%	3%	7%	7%
	Millennials (27–42)	53%	50%	51%	49%	56%	56%
	Gen X (43–58)	26%	30%	33%	42%	33%	33%
	Baby Boomers (59–77)	20%	17%	12%	6%	4%	3%
Gender	Female	61%	72%	52%	54%	50%	55%
	Male	39%	28%	48%	46%	50%	45%
Income level	Low	26%	20%	24%	19%	24%	28%
	Medium	39%	31%	38%	38%	34%	34%
	High	28%	43%	33%	39%	32%	30%
Occupation	Employed as a managing role	17%	13%	20%	24%	18%	17%
	Employed as a non-manager role	45%	33%	45%	46%	46%	42%
	Independent employment	10%	7%	11%	13%	12%	12%
	Student	4%	3%	3%	1%	2%	2%
	Retired	5%	3%	4%	2%	2%	3%
	Unemployed	14%	8%	11%	9%	10%	12%
Total sample size		2,700	4,100	5,600	6,200	7,300	6,900

3. Results

3.1. Consumption habits and preferences

The results show that the COVID-19 pandemic and its aftermath have significantly reshaped global wine consumption patterns between 2019 and 2024. These trends are evident in consumers' habitual purchases, wine type preferences, purchase channels and alcohol strength choices.

3.1.1. Habitual wine consumption

The percentage of habitual wine consumers fluctuated significantly during the study period, reflecting both the short-term and long-term impacts of the pandemic. In 2019, 57% of consumers considered themselves habitual wine buyers. During the 2020 lockdown, this percentage rose to 59%, likely due to increased home consumption caused by the closure of restaurants and bars, forcing consumers to buy wine for private drinking. However, by 2021, the habitual purchase rate had dropped sharply to 49%, possibly due to economic pressures, pandemic fatigue, or a shift in priorities as the lockdown continued.

In 2022, as social gatherings resumed and consumer confidence briefly rebounded, post-pandemic consumption surged, with the proportion of habitual drinkers reaching a record high of 63%. However, this recovery was short-lived. By 2023, the proportion fell to 55%, and in 2024 it plummeted to 44%, indicating that this was a structural decline rather than a temporary drop. This downward trend may reflect broader economic pressures, such as reduced disposable income due to inflation.

From a demographic perspective, Millennials have consistently been the largest group of habitual buyers, followed by Gen X, with Gen Z lagging significantly behind. This generational difference highlights that wine has stronger cultural roots among older generations, while Gender differences were small with slighly more male consumers than female. Occupation and income further divide consumption habits. Those in managerial positions and high-income groups had the highest engagement, likely due to wine's association with discretionary spending and lifestyle. In contrast, unemployed and low-income respondents had the lowest consumption rates, highlighting the economic barriers to habitual purchases.

3.1.2. Consumption frequency of different types of wine

Overall, red and white still wines dominated in all survey years, but the frequency of wine consumption in all categories has declined after 2022, with a significant increase in the number of respondents who do not drink certain type of wine.

Red wine was the most consumed wine category, with consumption peaking in 2022, with 26% of respondents drinking it weekly or monthly. However, by 2024, the percentage of non-consumers rised to 28%, while regular drinkers decline to 17% drinking weekly and 3% drinking daily. White wine shows a similar trend: the percentage of non-consumers rises from 25% in 2023 to 31% in 2024, while weekly and daily consumption declines to 17% and 3%, respectively.

Sparkling wine and rosé wine, often associated with celebrations, saw a brief surge in 2022 as social activities resumed. By 2024, consumers who do not drink sparkling wine surged to 34%, while the non-consumer category of rosé wine reached the same level, indicating that people's demand for festive or occasional wines has decreased after the epidemic. Dessert wine, which was originally a niche category, has become an increasingly unpopular category, with 36% of consumers not drinking it by 2024, a trend that may be related to its limited diversity in casual drinking occasions.

In terms of generations, Gen Z and Millennials drove red and white wine consumption, although their participation declined after 2022. Both groups ranked red wine as their first choice, followed by white wine, while sparkling and rosé were reserved for special occasions. Baby Boomers have seen the most significant decline in wine consumption, especially for sweet and sparkling wines, which may be due to health concerns or an aging palate.

In terms of gender, men consumed more wine overall, especially red wine, while women slightly prefer white wine. After 2022, wine consumption decreased for both genders, but men's red wine consumption declined more.

3.1.3. Wine purchasing channel preference

The pandemic also appeared to have accelerated a shift in where consumers buy or consume wine. Supermarkets accounted for 33% of total wine purchases in 2019, declining steadily to 24% by 2024. This decline may reflect competition from online retailers or a growing consumer preference for specialty products not readily available in grocery stores. Online shopping surged during lockdown (16% in 2020) but fell back to 10% by 2024 as in-store shopping normalized. A post-pandemic decline in e-commerce may also indicate consumer frustration with delivery logistics or a desire for a tactile shopping experience. Restaurant venues (HoReCa) remained insignificant (less than 4% in all years), highlighting the lasting impact of store closures and reduced frequency of dining out during the pandemic. Specialty wine shops maintained a stable niche (around 9-10%) but decline slightly to 8% by 2024, which may indicate price sensitivity in the context of inflation, as these retailers typically premiumize their offerings.

3.1.4. Alcohol content preference

The appeal of low-alcohol wines has steadily increased post-pandemic, with overall preference rising from 44% in 2022 to 47% in 2024. Gen Z led the shift, with 50% favoring low-alcohol wines in 2024, followed closely by Millennials (48%). This trend is consistent with the health-conscious, moderate drinking lifestyle of younger consumers. In contrast, Gen X and Baby Boomers have seen a decline or fluctuation in interest, with Baby Boomers' preference falling from 56% in 2022 to 41% in 2024, a trend that may be related to changing health needs or skepticism about this product category.

Gender differences were clear, with women consistently preferring low-alcohol wines more than men, and their interest has grown slightly by 2024. Men's preference, while also growing, remained lower than that of female consumers, suggesting that male traditional wine drinkers may be slower to embrace the health trend.

3.2. Perception and evaluation of EU quality and origin certification

EU quality and origin certifications, such as Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI), are hallmarks of authenticity and regional heritage for wines within the EU. These certifications are intended to assure consumers of quality, terroir, and adherence to traditional production methods. However, consumer perceptions and evaluations of these labels have changed significantly between 2019 and 2024, which could be influenced by generational attitudes, economic pressures, and changing market dynamics.

3.2.1. Knowledge of EU quality and origin certification

Consumer awareness of EU wine quality and origin certifications initially increased, but then declined after 2022. In 2019, 41% of respondents said they knew "little or nothing" about these certifications, while only 31% were familiar. Awareness peaked in 2022, with the percentage of "not knowing or knowing very little" falling to 23% and "knowing very much" rising to 36%. This improvement may reflect the increased digital engagement of consumers exploring wine culture online during the pandemic. However, there was a sharp reversal in 2023-2024, with the percentage of "not knowing or knowing very little" soaring to 38% and the percentage of "knowing very much" falling to 28%. By 2024, 39% of consumers could identify less than 25% of EU wine denominations, suggesting waning consumer interest or information overload in a crowded market.

Generationally, Gen Z appeared to be the most knowledgeable group, with 36% still claiming to be very familiar with these certifications in 2024. Their digital native habits and exposure to social media-driven wine content may account for this advantage. In contrast, Baby Boomers experienced the most rapid loss of knowledge, with the percentage of "no or little knowledge" rising from 32% (2022) to 68% (2024), likely due to an aging population and a disconnect from evolving certification activities. Gen X followed a similar trend, with the percentage of "very knowledgeable" respondents halving between 2022 and 2024 (30% to 15%). Millennials, on the other hand, displayed a polarized awareness.

3.2.2. Willingness to pay premiums for certified wine

Overall, the willingness to pay premium for certified wines has declined after 2022, but the trends differed between wine consumers and non-consumers. Wine consumers showed moderate but fluctuating interest, while interestingly, non-wine consumers showed a slow (albeit limited) increase in willingness to pay premiums for these wines.

Among wine consumers, Gen Z initially showed the strongest enthusiasm (84% WTP in 2019), but fell sharply to 62% in 2021 before partially recovering to 66% in 2024. This fluctuation may reflect younger consumers' price sensitivity in the face of inflation or shifting perceptions of the value of certification. Millennials maintained a more stable interest, with WTP rebounding to 71% in 2024 after a mid-term decline, indicating their loyalty to certified wines. In contrast, Baby Boomers' WTP steadily declined (from 70% in 2021 to 59% in 2024), perhaps due to skepticism about certification or budget constraints. The same downward trend was seen among Gen X, from 69% (2022) to 60% (2024). For different income groups, high-income wine consumers' WTP remains the highest (79% in 2024). The WTP of middle-income consumers has recovered slightly to 65% (2024), while low-income consumers remained stagnant (53-56%), highlighting their affordability barriers.

Although a smaller market, non-wine consumers also presented niche opportunities. The most significant growth was seen among Gen Z non-consumers, with their WTP rising from nearly 0% in 2019 to 26% in 2024. High-income non-consumers also showed some potential, with their WTP rebounding to 26% in 2024. However, the lower-income groups in both segments remain price-sensitive, with their WTP stagnating below 20%.

In terms of gender, women's WTP remained stable (69% in 2024), while men's fluctuated more, reaching a peak of 812% in 2019 and then declining to 63% in 2024. This difference may be due to female tending to prioritize consistent quality, while male may be more responsive to economic fluctuations.

3.3. Sustainability and climate change

Sustainable wine production, which emphasizes environmentally friendly practices, ethical labor standards, and resource conservation, is gaining traction in recent years and producers strive to align with global sustainability goals. The data showed that consumer engagement with sustainable wine and awareness of its climate-related impacts changed significantly between 2019 and 2024.

3.3.1. Interest in sustainable wine

Interest in sustainable wine declined across all demographics after 2022, but differences persisted between groups. Among wine consumers, Millennials maintained the highest interest, followed by Gen X.

However, after 2022, all generations saw a sharp decline, with Baby Boomers and Gen X seeing the largest declines. Millennials, while relatively resilient, also showed a slowly declining trend in their interest in sustainable wine. This general decline may reflect "sustainability fatigue" or competing financial priorities against the backdrop of inflation. Gender differences were subtle with female showing slightly higher interest, but interest has steadily declined for both genders. Men's interests in sustainable wine were more volatile, peaking in 2022 and then falling sharply, while women were declining more slowly. Among the different occupational groups, managers were the most interested in sustainable wines, likely due to their higher disposable income and exposure to corporate sustainability initiatives. In contrast, retirees and the unemployed had the lowest interest, with both groups seeing a decline in engagement after 2022, a trend that could be related to budget constraints or a disconnect with workplace-driven sustainability issues. Students and the self-employed were in the middle, but their interest has also declined. Similarly, high-income wine consumers were still most interested, although their enthusiasm has gradually declined since 2021. Not only were the middle and low-income groups relatively least interested, but the interest of the low-income group was declining the fastest. It is worth mentioning that, unlike wines with EU quality and origin certifications, there was not much interest in sustainable wines among non-wine consumer respondents.

3.3.2. Perceived Importance of sustainable practices

There has been a notable shift in consumer focus on sustainable wine production, from emphases on environmental factors to a balanced focus on economic, social and ecological factors.

During the study period, consumer emphasis on biodiversity protection (28% of respondents placed it as the most important aspect in 2019 to 19% in 2024) and chemical reduction (44% to 26%) declined, perhaps because consumers believe these practices have become standard or have shifted their attention to emerging issues. Sustainability certifications also declined (30% to 25.49%), suggesting that consumers may have doubts about their rigor or relevance.

Fair producer pricing gradually became a top consideration, while fair wages rose from 17% to 22.09%. This shift reflects consumers' growing awareness of ethical supply chains and labor equality. In addition, water conservation saw the largest increase (15% to 26%), which may be influenced by the narrative of drought and water scarcity caused by climate change. Reducing waste also gained attention (14% to 21%), which is consistent with the broader cultural shift towards a circular economy. Energy saving/CO2 reduction and local culture preservation remained stable, indicating consumers' continued attention to climate action and cultural heritage protection.

Younger generations were leading the shift toward balanced priorities. have shifted their focus away from extreme environmental concerns (e.g., chemical reduction, down from 46% to 26%) toward greater emphasis on economic fairness (fair pricing up 5% and fair wages up 43%). Their priorities in 2024 spanned water conservation (26%), local culture (30%), and waste reduction (21%), reflecting their holistic view of sustainability. The gap between their highest and lowest priorities has narrowed from 33% (2019) to 12% (2024), indicating a shift away from single-issue advocacy toward integrated values.

3.3.3. Awareness of climate change impact on wine

Awareness of the impact of climate change on wine production varied significantly across different groups. Millennials and Gen Z were the most aware consumers, although awareness among Gen Z has declined since 2022. In contrast, Baby Boomers lagged notably behind. Across gender groups, male wine consumers showed slightly higher awareness than their female counterparts. Occupational differences were also evident: managers and self-employed individuals demonstrated greater awareness than retirees and the unemployed, highlighting the influence of professional environments in fostering climate literacy. Among non-wine consumers, overall awareness was somewhat lower, however, students and professionals within this group displayed comparatively higher levels of awareness. Income differences further shaped these patterns. High-income wine consumers exhibited the highest levels of awareness, likely due to greater access to education and sustainability-focused marketing. Middle- and low-income groups showed lower awareness levels, and a similar trend was observed among non-wine consumers, with higher-income individuals demonstrating slightly greater awareness than their lower-income counterparts.

4. Discussion

4.1. Consumption habits and preferences

First, the COVID-19 pandemic triggered a major shift in wine consumption patterns, as evidenced by fluctuations in habitual wine purchases. The initial surge in wine consumption during the 2020 lockdown was in line with global trends, when wine became a coping mechanism for stress and anxiety, especially among middle- and high-income groups [17]. This growth was also facilitated by the shift to home consumption as restrictions on dining venues prompted consumers to turn to home delivery and retail [18]. However, the sharp decline after 2022, which ultimately led to a structural decline in the proportion of habitual buyers by 2024, reflected broader economic pressures, such as reduced disposable income due to inflation, and fatigue caused by the pandemic [17]. This may be because although anxiety initially stimulated consumption, long-term stress led to behavioral readjustments [19].

Second, this study found differences in wine consumption trends across generations. Millennials remain the core demographic for habitual wine purchases, driven by sociability, tradition, and food pairing habits [20]. Their continued engagement contrasts with the lagging engagement of Gen Z, which may be due to their preference for novelty drinks such as hard seltzer or non-alcoholic alternatives. Meanwhile, the decline in engagement among Baby Boomers is associated with health-conscious moderation, as older adults increasingly prioritize health over daily drinking [21]. This generational difference highlights a shift in cultural values, with wine's traditional appeal competing with Gen Z's experimental preferences and Baby Boomers' health-driven restraint.

Furthermore, red and white wines retained their dominance, but all categories faced consumption declines after 2022, especially sparkling and dessert wines. The resilience of red wine among older, high-income consumers [22], and the appeal of white wine to younger demographics [23], highlight the enduring preference for classic wines. However, the sharp decline in celebratory wines such as sparkling and rosé wines suggests that social gatherings have declined after the pandemic, as these wines are closely associated with various events [24]. Niche categories such as sweet wines have been further impacted due to their limited diversity in casual occasions, highlighting the trend of consumption driven by the environment [25].

In addition, the purchase channel was also evolving dynamically. The decline in popularity of supermarket reflects competition from online platforms and the trend of premiumization, as digitally savvy consumers, especially those with higher education, have made full use of e-commerce platforms during the lockdown [26,27]. However, after 2022, consumers will return to physical stores, indicating that the tactile experience is still crucial for a product that relies on sensory evaluation, such as wine [28]. Despite its low share, the niche market of specialty stores was relatively stable, and this channel often offers higher quality wines, which may be due to the fact that premiumization still has great appeal for some wine consumers, especially among high-income groups. These trends suggest that purchasing channels are fragmenting, with consumers weighing multiple factors such as convenience, price and shopping experience.

Finally, the appeal of low-alcohol wines has increased, especially among Gen Z and Millennials, driven by health-conscious lifestyles and moderate drinking habits [29,30]. Young consumers' openness to these products contrasts with the skepticism of Baby Boomers, which stems from entrenched taste preferences and distrust of "health-washed" products [31]. Despite the growing demand for low-alcohol wines, price sensitivity remains as consumers resist the high prices of low-alcohol wines [32], necessitating the development of competitive strategies to capitalize on the expected market growth [6].

In summary, the post-pandemic wine landscape is shaped by economic pressures, generational values, and health trends. While traditional varieties and channels remain important, the rise of moderate consumption and digital native consumption suggests that the industry is in transition and needs to innovate in product positioning and accessibility.

4.2. Perception and evaluation of EU quality and origin certification

The shift in awareness of EU quality and origin certification between 2019 and 2024 revealed a paradoxical interplay between pandemic-driven engagement and post-crisis disengagement. The initial boost in consumer awareness during the pandemic is consistent with research showing that lockdowns stimulated digital exploration of wine culture as consumers turned to online platforms and virtual tastings to compensate for limited social interaction [33]. This surge was particularly pronounced among Gen Z, perhaps due to the fact that younger digital natives more frequently use social media to deepen their knowledge, while older groups, especially Baby Boomers, struggled to keep up with the evolving certification movement [34]. However, the decline in awareness after 2022 suggests information saturation or the emergence of competing priorities as pandemic restrictions ease. This reversal highlights the fragility of crisis-driven engagement. Beyond this, Gen Z's retention of certification knowledge aligns with their preferences for sustainability and transparency, traits further amplified by the role of social media in spreading environmentally conscious messages [35]. Conversely, the dramatic loss of knowledge among Baby Boomers highlights the disconnect between traditional certification marketing and the media habits of older consumers, who often prioritize offline channels [34]. This difference is critical, as older demographics have historically been the backbone of the premium wine market, but their declining engagement could undermine the perceived value of certification.

The WTP for certified wines further illustrates this trend. The decline in WTP after 2022, especially among Gen Z, reflects inflationary pressures and price sensitivity among younger consumers [36]. This contrasts with the relative loyalty of Millennials, which may stem from established brand trust or alignment with their peak income years [37]. High-income consumers' persistent WTP reinforces the link between disposable income and premiumization, while low-incomes' stagnation of low WTP highlight affordability barriers, echoing global trends in which economic inequality affects consumption [38].

Notably, the growing interest among non-wine consumers suggests that certification has a desirable or gifting appeal even for non-habitual consumers. This niche potential is consistent with research that highlights certification as a sign of luxury or ethical consumption [35]. However, gender differences complicate this picture. Women's stable WTP and men's volatility may reflect different priorities with women generally prioritizing consistent quality and ethical claims, while men's purchasing behavior is more skewed toward economic volatility [39]. Declining WTP among Baby Boomers may indicate their skepticism about the practical benefits of certification or fixed income constraints [37]. These trends highlight a key challenge that certification must balance motivational messaging with affordable prices to remain relevant across demographics [36].

The findings suggest that for Gen Z and Millennials, leveraging digital platforms to highlight the environmental and social benefits of certification could reinvigorate engagement [35]. Conversely, streamlining messaging for older consumers through traditional media or community tastings could mitigate knowledge loss [40].

4.3. Sustainability and climate change

Consumer engagement with sustainable wines has different trends before and after the pandemic. Consumer interest in sustainable wines peaked in 2022, but after the pandemic, interest declined across all demographics, with Millennials remaining the most engaged group. This is consistent with studies that highlight Millennials' strong environmental awareness and willingness to pay a premium for sustainability [35]. However, the decline after 2022 stands in stark contrast to previous optimism, suggesting that economic constraints (exacerbated by inflation and post-pandemic recovery) have curbed spending on premium products, especially among lower-income groups and retirees [41]. The continued interest in sustainable wines by high-income consumers and managers highlights the deep awareness of sustainability among disposable income and professionals [9], while the indifference of non-wine consumers reflects their lack of perceived relevance or trust in certification [42].

The decline in interest in sustainable wines also reflects a possible paradox, where economic pragmatism often overrides idealism despite consumers' growing emphasis on ethical production. For example, Gen Z's price sensitivity [36] and Baby Boomers' skepticism of "health-washed" products [17] highlight the tension between aspirational values and purchasing behavior. Trust in sustainability claims has become a key factor [42], but inconsistent labeling standards and concerns about "greenwashing" may have eroded confidence after 2022, especially among older cohorts.

During the survey period, consumers' priorities for sustainable practices shifted significantly, from a narrow focus on extreme environmental factors to a more holistic perception. The rise of fair pricing and fair wages as priorities reflects growing ethical consumerism, especially among younger generations who demand transparency about labor practices [43]. This aligns with research highlighting social responsibility as a key driver for Millennials and Gen Z [35]. However, the decline in biodiversity prioritization contradicts research advocating biodiversity as core to sustainable development [44], perhaps because consumers today consider it as a basic expectation rather than a premium attribute.

The increasing emphasis on water conservation and waste reduction suggests a growing awareness of resource scarcity and circular economy principles, which may be supported by climate-related media coverage [45]. However, the stability of energy/CO_2 reduction and local culture preservation as priorities suggests that recognition of climate action and cultural heritage remains durable even when trends change.

Awareness of the impacts of climate change on wine production remains mixed, with Millennials and Gen Z being the most aware groups, but Gen Z awareness declined after 2022. This decline may reflect information overload or conflicting priorities, as younger consumers are usually subject to making trade-offs between climate issues and economic pressures [36]. While continued awareness among high-income groups is associated with greater access to education and engagement with sustainability narratives [40], low awareness of climate change among low-income groups highlights systemic inequalities in climate literacy. Additionally, awareness among non-wine consumers was low, suggesting the role of product engagement in climate education. This is consistent with research showing that informed consumers are more likely to support adaptive practices, such as resilient rootstocks [40].

In addition, research has showed that there is limited uptake of innovative strategies, such as fungus-resistant grapes, suggests a preference for familiar solutions over disruptive change [45]. This highlights the importance of clearer communication when promoting environmentally friendly products with highly innovative concepts, in order to enhance consumer acceptance.

In summary, while younger consumers drive demand for ethical and holistic practices, economic barriers and information asymmetries hinder widespread adoption of these measures. Therefore, the industry needs to increase transparency and tailor messaging to different demographic groups, and combine reasonable pricing with affordability to ensure that sustainable development is both desirable and achievable.

5. Conclusion

This study examined the evolution of wine consumption trends from 2019 to 2024, revealing a complex wine consumption market landscape before and after the pandemic. The initial consumption surge during the lockdown was eventually replaced by a structural decline. Generational differences were evident, with Millennials remaining the core consumers while Gen Z was more interested in low-alcohol wines. Although interest in sustainable wines declined after 2022, consumer priorities evolved from narrow environmental issues to more comprehensive perceptions, such as a significant increase in the importance of fair pricing and water conservation. These findings suggests that the wine industry needs to respond to the generational shift through product innovation (such as low-alcohol wines) and digital native marketing (especially in terms of certification). Sustainability messaging should emphasize comprehensive benefits (economic, environmental and social aspects) rather than the promotion of single attributes. Pricing strategies should strike a balance between premium positioning and accessibility to retain price-sensitive young consumers. Ultimately, to succeed in this evolving market, winemakers should balance tradition and innovation, quality and affordability, environmental responsibility and economic realities, which is both challenging and necessary for the industry's long-term resilience.

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