

CONSUMER BEHAVIOR METRICS SUPPORT INNOVATIONS TO ELIMINATE SECONDHAND SMOKE

Philter Technologies, Inc.

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Abstract

The harmful impact of secondhand smoke (SHS) from nicotine is well documented. Cannabis SHS has only recently been studied, and such studies indicate cannabis SHS is more harmful than that of nicotine. Large cannabis operators (MSOs, vape device companies, flower/oil companies) do not want to hear this, and are mostly unaware how cannabis SHS is an issue for many of their customers. They have not queried their customer base about SHS.

Our customer surveys clearly indicate that when provided a convenient and easy-to-use solution to eliminate SHS at the source, cannabis and nicotine consumers report a number of use cases where they desire to eliminate SHS.

Empirical data from over 7,000 survey respondents who have eliminated their secondhand smoke with proof-of-concept products from PHILTER shows consumers' strong desire to protect others, eliminate the lingering odor, and a strong willingness to change their behavior to achieve these positive outcomes. Many respondents are in a relationship and own their home, some have children and most have pets, and a majority are concerned about the environment. This demographic profile describes a population that is far larger than PHILTER™'s customer base to-date.



Consumption at home is the primary location for eliminating SHS. Filtering exhalant from consuming cannabis and nicotine is experiential, such that once done, consumers readily name additional use cases where they want to eliminate their SHS. Almost 90% of respondents reported how they feel much better about their cannabis consumption when eliminating SHS.

Consumer adoption of new behaviors to reduce harm and/or improve safety is well documented (sunscreen, bicycle helmets, etc.). Convenience, ease-of-use and efficacy are important characteristics for products to succeed. Consumers are also requesting sustainability in products when making repeat purchases.

Inhaling any smoke is inherently unhealthy. And yet nicotine and cannabis consumption continue to grow. Eliminating SHS significantly reduces the harm from cannabis and nicotine consumption. But SHS must be eliminated at-the-source to be truly effective. Relying on HVAC systems inherently enables inhalation of toxic SHS. Eliminating cannabis SHS at-the-source creates a healthier environment and addresses likely future regulations as cannabis moves towards federal legalization.

PHILTER™ solutions enable the cannabis and nicotine industries to tackle the decades old health hazards of SHS.

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THE PHYSIOLOGY of BREATHING

Breathing is critical to human life. Human lungs absorb oxygen and expel what we do not need. Exhaling is a natural means of ridding ourselves of waste materials such as carbon dioxide. Gaseous exchange is an essential part of breathing.

The moisture droplets in human exhale contain substances, described as particles, which may or may not be harmful. In a healthy person, lipids and proteins from the lung lining are part of the particulate exhalant.^{1 2}

Inhaling cannabis or nicotine significantly increases the amount of particulate matter taken into the lungs, and consequently the exhale has a higher concentration of particulate matter. After inhaling cannabis or nicotine, the exhale is propelled out with greater velocity. With exhale propulsion, the higher concentration of particulate matter means more harmful substances in the air with a larger footprint. These are a few physiological reasons why secondhand smoke (SHS) is well known to be more harmful than a normal exhale.

Secondhand Smoke – The Perennial Problem

The harmful impact of SHS from nicotine consumption is well documented, and can lead to lung cancer, heart disease and other ailments.³ The cannabis industry perceives the health risks from cannabis use as minimal, including cannabis secondhand smoke. However, scientific studies demonstrate the harm from cannabis SHS is equal to or greater than that from nicotine and tobacco. A recent study from the University of California, Berkeley discovered that cannabis SHS from bong usage has 4x the particulate matter compared to nicotine.⁴

Studies by MIT and Virginia Tech, reported in the WSJ noted that particulate matter in exhalant from any vape or combustible is propelled up to 20 feet and harmful particulates lingers for as long as 30 minutes. Since cannabis smokers hold the smoke in the lungs longer than nicotine smokers, the exhale is typically more forceful, creating a greater exposure footprint to the harmful particulates in cannabis SHS.

SHS has plagued societies for decades. Despite the known harm, smoking and vaping of nicotine and cannabis continues to grow. There has been no viable solution for consumers to enjoy their smoking/vaping experience without creating SHS in any setting or situation, until now.

¹ Particle Concentration in Exhaled Breath, June 4, 2010;

<https://www.tandfonline.com/doi/abs/10.1080/15298668791385868>

² Exhaled Particles and Small Airways, January 1, 2019.

<https://respiratory-research.biomedcentral.com/articles/10.1186/s12931-019-0970-9>

³ Center for Disease Control and Prevention;

https://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/health_effects/index.htm

⁴ JAMA Network, March 30, 2022; Fine Particulate Matter Exposure from Secondhand Cannabis Bong Smoking,

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2790510>

Innovative Solutions to Eliminate Secondhand Smoke (SHS)

Philter Technologies (PHILTER™) has created innovative clean air technology that filters out harmful particulates. The highly effective and small footprint provides flexibility in placing the filtration device at the source of harmful air. Eliminating the harmful air before it can be inhaled is a huge advancement in human health. Current reliance on HVAC systems inherently enables inhalation of harmful air until the system can fully clear an area or room. Eliminating harmful air also eliminates (a) obnoxious odors and (b) third hand smoke, which emanates from the materials the harmful particulates attach to (carpets, walls, furniture, clothing). Mayo Clinic and John Hopkins state there is no safe level of third-hand smoke, particularly for infants or young children.⁵

PHILTER designed Proof-of-Concept products to better understand consumer behavior around the elimination of SHS. The main thrust of this paper is conveying the market intelligence from consumers who used these Proof-of-Concept products.

The Proof-of-Concept products are handheld devices that consumers exhale into after inhaling their substrate of choice. The result is the elimination of secondhand smoke and odor. The health benefits are the elimination of harmful particulates that cause diseases. Cannabis consumers were the target audience.

The Proof-of-Concept products shown here are backed by nine granted utility patents, three design patents. Additional patents are pending.



⁵ The Impact of Thirdhand Smoke on Kids, John Hopkins Medicine, <https://www.hopkinsmedicine.org/health/wellness-and-prevention/the-impact-of-thirdhand-smoke-on-kids>

CONSUMER DATA METRICS

Philter Technologies queried 35,000 customers of Proof-of-Concept products to better understand their behavior around eliminating SHS from cannabis consumption. In several customer surveys through email and Instagram, PHILTER received an average of over 2,000 responses per question, with a maximum of 7,697. For each group of data points, the number of respondents is disclosed.

General Comments from Cannabis Consumers about Eliminating SHS

- Eliminating SHS causes consumers to feel better when consuming cannabis.
- The process of eliminating SHS is experiential.
 - Once a consumer uses a PHILTER™ product, he/she readily identifies a range of settings where they cannot be without it.
 - Repeat order data points to **six to eight purchases per year**.
- Consumers prefer sustainable products.
- Highly concern over their impact on the environment and safety of others.
- Consumers desire exhale filtration integrated into the smoke device for convenience.

Pain Points of Secondhand Smoke

Eliminating SHS addresses several Pain Points that were commonly mentioned.

- Eliminates a lingering odor.
- The desire to protect others (children, partner, friends, pets) from SHS.
- The desire to consume with discretion in both private and public spaces.
- The desire to maintain an active lifestyle and not bother or affect others.
- Eliminates guilt for parents who don't want their kids to see or smell smoke or be exposed to thirdhand smoke.
- The ability to consume while traveling.
- Eliminates odor in vehicles, much more effective than open windows.
- Eliminates a sense of isolation when at an outdoor gathering.
- Eliminates guilt for pet owners who care for their pets.

Summary Demographic Profile

The demographic data from respondents describes an exceptionally large population.

- 61% are urban dwellers; 39% are rural/suburban dwellers
- 43% are in a relationship
- 45% own their home
- 18% have children
- 72% own pets
- 67% consume cannabis predominately at home
 - When at home, 52% consume indoors / 48% consume outdoors

The number of respondents for these profile questions ranged from 1,810 to 7,697.

Millennials are Early Adopters and the Largest Group of Cannabis Consumers

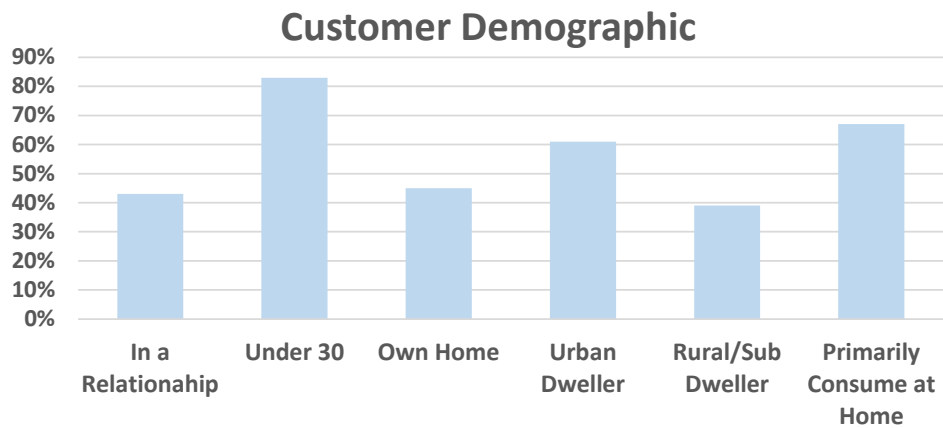
Most survey respondents are in the Millennial and Gen Z age groups, partly due to the direct-to-consumer (DTC) marketing strategy use of social media. Millennials represent approximately half of the US cannabis consumers.

- Nearly 50% of individuals in the US reporting cannabis use are in the millennial age group.⁶
- Millennials have disposable income and have predominately outgrown the rebellious act of smoking and now use cannabis to manage stress, anxiety and sometimes pain or health issues.
- As much as 76% of Millennials believe cannabis should be fully legalized.
- Millennials and Gen Z have expressed the desire for a stress-free way to consume, and PHILTER(TM) products provides a sense of effortless consumption.

⁶ Chicago Tribune, February 2020. <https://www.chicagotribune.com/marijuana/sns-tft-millennials-fuel-cannabis-economy-20200226-hf3agwtx2napvdzctusdkmykxy-story.html>

Customer Profile Data

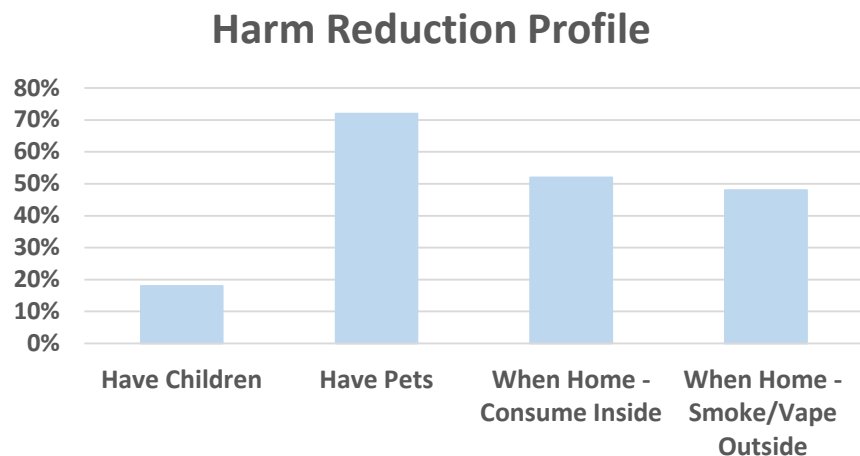
(1,810 to 7,697 Respondents per Question)



Consumer Metrics

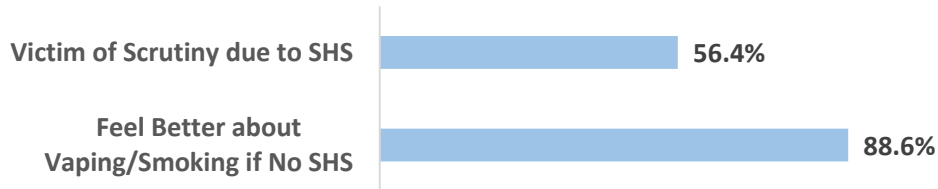
(1,957 to 6,304 Respondents per Question)

- 43% are in relationships and 45% own their own home – This is an indication of socio-economic stability and points to the predominance of mature adults choosing to eliminate SHS.
- Survey respondents are primarily 30 and younger. This is due to DTC marketing strategy.
- Urban dwellers constitute just 61% of respondents. Rural/suburban dwellers have more outdoor space to consume cannabis discreetly, and yet 39% of the survey responses came from rural/suburban dwelling customers. This shows how close-quarter environments of urban dwellers are far from being the only reason for consumers to filter SHS.
- 67% primarily consume cannabis at home – Points to the harm reduction orientation of consumers – reduces harm for others in the home.
- When consuming cannabis at home, 52% consume indoors – Outdoor and indoor consumption were balanced. It is easy to assume it is not necessary to filter SHS when outside. And yet consumers choose to filter their exhalant at home even when outside.
- 18% of respondents have children – Young families express concerns over the health of children.
- 72% own pets – Consumers desire to eliminate SHS exposure to pets.



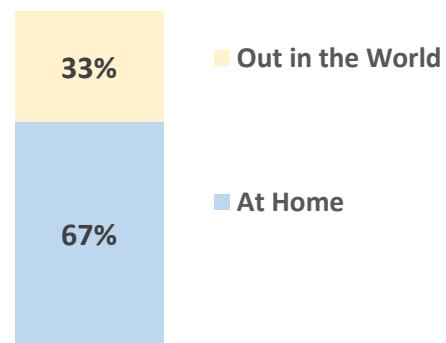
Just over half (56.4%) of respondents indicated they had been a victim of scrutiny due to secondhand smoke. It is surprising that this statistic is not higher. This means it is **not necessary to have a poor experience with SHS to want to eliminate SHS**. Answers to a follow-on question verify this. 88.6% of respondents indicated they feel better about smoking or vaping when there is no SHS.

Experience with SHS



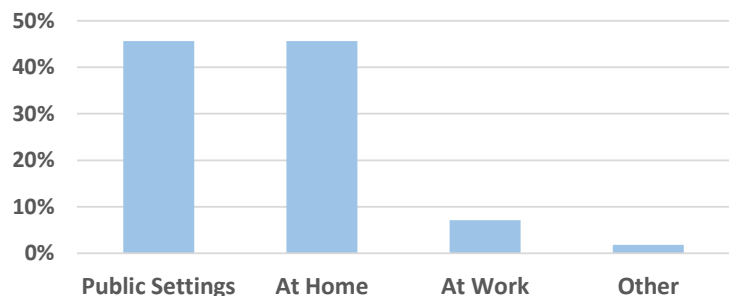
Select One Location Where Consume Cannabis

When asked where do you typically consume cannabis, and only given two choices, 67% indicated they consume 'At Home' while 33% selected 'Out in the World.' This correlated well with previous questions.

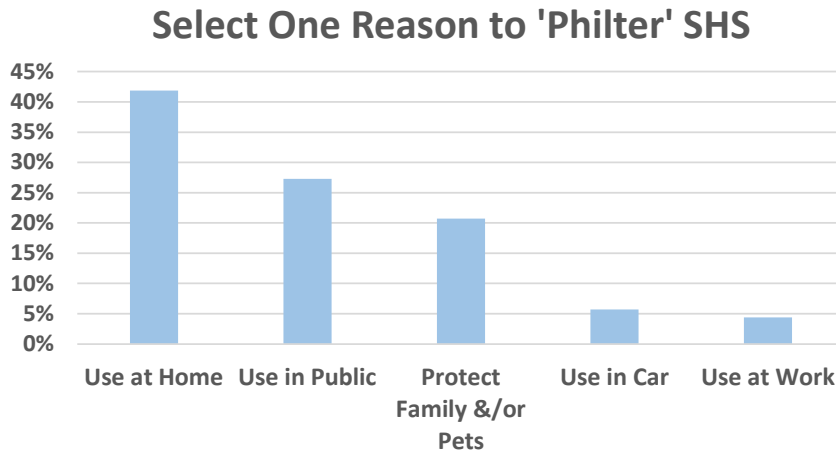


When asked for the one setting where most concerned about SHS, the results were evenly split between public settings and at home. This is surprising because it is far easier to be discreet at home by walking outside or to the garage or somewhere away from others. It is natural to desire to be more discreet about cannabis consumption in public, but when this concern is on parity with consumption at home, it points to additional desires of harm reduction and elimination of lingering smell in the home, which is revealed in commentary from customers.

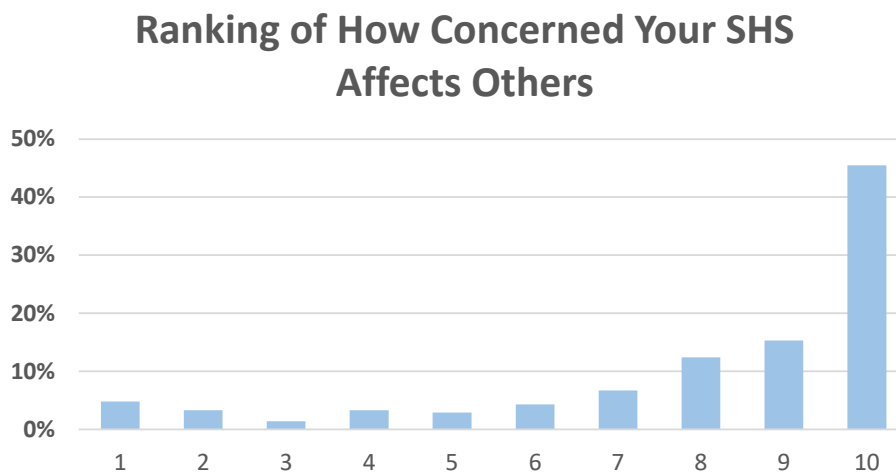
Location Where Most Concerned about SHS



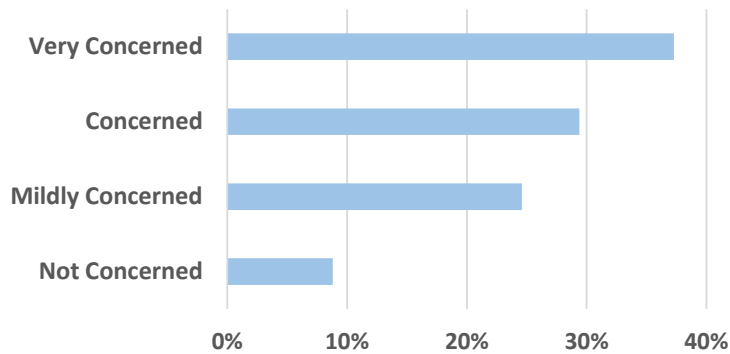
When asked to select the one primary reason customers filter their exhale to eliminate SHS, there was a diversity of reasons. This points to the variety of concerns vapers and smokers have. Use in public was selected by just 27.3% of respondents. Home based reasons (use at home and protect family and/or pets) combined was selected by 63% of respondents. **This points to the health concerns related to SHS exposure in a home setting.**



It was surprising to learn that **discretion was not the primary reason to eliminate SHS**. Most customers are concerned about how SHS affects others. When asked to rank the importance of SHS impact on others as a reason to use PHILTER™ products, 73.2% of respondents placed it in the top three deciles of importance, the 8, 9 and 10 categories. The medium to high concern group (top 5 deciles) was selected by 84.2% of respondents.



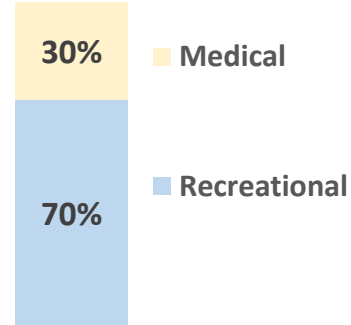
How Concerned Your SHS Affects the Environment



PHILTER™ customers demonstrate an environmental consciousness. 66.7% of respondents indicated they were concerned or very concerned (top two selections) about how their SHS affects the environment. 91.2% expressed some level of concern, while just 8.8% of respondents indicated they were not concerned how SHS affects the environment.

Most respondents use cannabis recreationally. But there were a substantial number of respondents who use cannabis medicinally. The data indicates that regardless of one's purpose to consume cannabis, eliminating SHS is an ongoing issue. It has been reported that medical users typically consume cannabis more frequently compared to recreational users. For reference, during 2021 in the Colorado market, tax records indicate approximately 18% of industry revenues came from medicinal users.

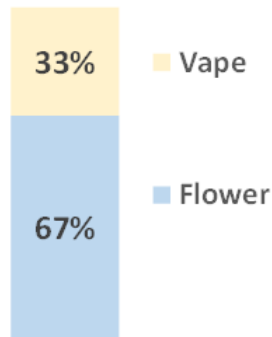
Smoke Cannabis for Medical or Recreational Purposes



With a significantly higher percentage of respondents, 30%, reporting medicinal use, this points to:

- Medicinal users are **willing to change their habits to include elimination of SHS.**
- Medicinal users are early adopters of PHILTER™ solutions.
- Medicinal users may have a heightened concern over the impact of their consumption and the generation of SHS on others.

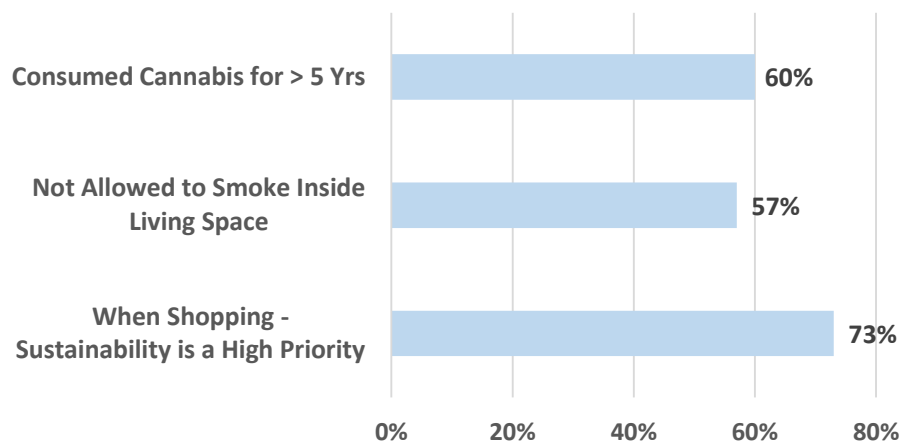
Prefer Flower or Vape for Cannabis Consumption



It is not surprising that most consumers that purchased PHILTER™'s Proof-of-Concept products to eliminate SHS prefer flower over vaping oil. Flower has more odor and vaping is considered a more discreet manner for consumption. And yet, one third of respondents prefer vaping over flower. This points to how the **issues around SHS are not solely related to flower.**

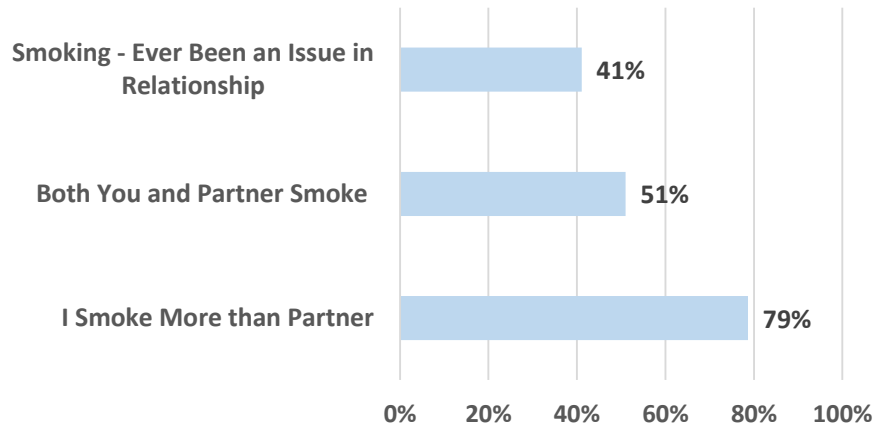
Most respondents have consumed cannabis for more than five years. This further demonstrates that **longer term cannabis consumers are willing to adjust their consumption habits to eliminate SHS.** A slight majority of respondents are not allowed to smoke in their living space, which may be impetus for being discreet. When shopping and making repeat purchases, 73% of respondents indicated they place a high priority on products that focus on sustainability.

Consumer Preferences



Half of respondents (51%) that are in a relationship indicated that both parties smoke cannabis. But only 41% indicated that smoking is or has ever been an issue in a relationship. A significant majority, 79%, said they smoke more than their partner. This data points to how product marketing can include those who do not smoke. The desire to eliminate SHS is not just the purview of those who smoke or vape. In fact, it may be the non-smoker in a relationship that is most instrumental in eliminating SHS.

Relationship Insights



CONSUMER TRENDS IN HARM REDUCTION

It is no surprise consumers are willing to filter their exhale when it reduces harm to others and themselves, eliminates odor, enhances social situations, and is convenient. For decades consumers have taken on harm reduction behaviors. Convenience, improved health, lower stress, and safety are common themes of such consumer trends.

Safety & Harm Reduction – Prevalent in Several Long Term Trends

The increasing use of sunscreen

- With documented knowledge of the harmful impact of too much sun exposure, including cancer, consumers more readily use sunscreen.
- Increased health orientation has moved consumers to apply sunscreen more regularly.
- Sunscreen with increased protection (higher SPF) is currently used much more than in past years.
- A common theme is to enjoy the sun, but wear more sunscreen.

The use of helmets while bicycling

- For many decades, helmets were never on the consumer's radar.
- It is a predominant behavior to wear a helmet while bicycling. In some states it is the law for those under 18.
- It is common for bicycle groups and clubs to require helmets.

The use of helmets while snowboarding or skiing

- For decades, helmets were only used by the top racers in the world.
- For safety, the use of helmets is mostly universal now.

Use of seat belts

- Seat belts were initially an added safety feature.
- As auto use increased, vehicle accidents and fatalities increased.
- The creation of 'over the shoulder' straps improved safety.
- Most drivers and passengers adopted the behavior of buckling-up before it became mandatory.
- Vehicles now warn the driver if someone is not wearing a seat belt.

Children seats in autos

- Safety over convenience is a primary theme with this trend.
- Special seats for children are not convenient to use or lug around from vehicle to vehicle.
- Most parents will always put a child in a protective seat, regardless of regulations.
- Parents lug auto seats through airports, not convenient but it ensures safety of their children.

The increasing use of apps and delivery services to obtain groceries

- This trend is more predominant for Millennials.
- Consumers are willing to pay for greater convenience and less stress.

The growth in healthy meal plan services

- Consumers are willing to pay for health enhancement from pre-defined meal plans.
- Convenience and lower stress over food preparation

Summary of Consumer Trends and Eliminating SHS

For decades, consumers have demonstrated an affinity to improve their health and safety while enjoying their preferred activities. Convenience is important to consumers. Yet, as the list of consumer trends above shows, many consumers place greater emphasis on harm reduction which can overcome inconvenience in adopting the behavior. The prevalent use of sunscreen, helmets (bicycling and snowboard/skiing) and child protection devices for autos fit this description.

Eliminating SHS enhances the well-being and health of the smoker and those in the vicinity (children, spouse, non-smoking friend, even pets). Additionally, the unwanted odor when indoors is eliminated.

Medicinal users of cannabis (pain management, PTSD, etc.) have complained about the negative stigma resulting from their consumption. PHILTER™ solutions address this concern.

SUMMARY

Key Takeaways from Consumer Metrics

The demographic profile of survey respondents – cannabis consumers that want to eliminate their cannabis SHS - defines a very large population segment. Most respondents are in the Millennial and Gen Z age groups, primarily due to the social media DTC marketing strategy. Millennials represent approximately half of the cannabis consumers in the US.

- Approximately half of respondents (56.4%) had previous issues with SHS before purchasing a PL product. This means almost half decided to purchase products that eliminate SHS even though they did not have any previous incident with SHS.
- When only one location is selected, the home was identified as the primary place where SHS is a concern. It's easy to assume that discretion is a concern for SHS and consumers would prefer SHS elimination when away from home. But consumers want to protect others (children, non-smokers, pets) and eliminate the lingering smell at home.
- The majority of respondents prefer flower over vaping. And yet 33% of respondents prefer vaping, which points to the broad demand to address SHS issues regardless if the consumer prefers vape or flower.
- The vast majority (88.6%) of consumers that eliminate SHS indicate how they feel much better about their cannabis consumption when eliminating SHS.
- Concern over cannabis SHS is not just an urban issue where people live in close proximity. 39% of respondents live in rural or suburban locations.
- When asked to name the primary location where SHS is a concern, consumers expressed an equal concern for home and public settings.
- In two different questions regarding concern over SHS affecting others and the environment, there was consistency in how a significant majority, 73.4%, are highly concerned about the impact on others, and over 91% expressed concern over how SHS affects the environment.
- When shopping for any products, 73% said sustainability is a high priority in their decision. This points to the prevalence of conscious consumption for both cannabis and non-cannabis items.
- Most respondents have smoked cannabis for over 5 years. This points to the willingness to adjust consumption habits to eliminate SHS.
- 30% of respondents indicate the primary use of cannabis is for medicinal purposes. Since medicinal cannabis users typically consume more frequently, this additionally points to the willingness to adjust long term consumption habits to eliminate SHS.
- Although most respondents were 30 or younger, almost half owned their own homes, were in a relationship, and/or had pets. This defines a stable socio-economic demographic profile, which is significantly large.
- Over 60% had consumed cannabis for over 5 years. This identifies the willingness to alter behavior to benefit from the elimination of SHS.
- Filtering cannabis exhale is an experiential phenomenon. Once consumers try it, they report many use cases where they do not want to be without the ability to filter their exhalant when consuming cannabis.

APPENDIX – CONSUMER COMMENTARY

Consumer Commentary from Eliminating Secondhand Smoke

More than 850 product reviews with customers sharing their experiences and how PHILTER solves their biggest pain points: <https://philterlabs.com/pages/reviews>

Keely S. Verified Buyer

★★★★★

LOVELY!

Works like a charm! Bring it with me everywhere. I'm the type that doesn't really care that people know I smoke but this comes in handy when trying to keep the smell and smoke down to be considerate of others!

On PHREND

Nathan D. Verified Buyer

★★★★★

INSANE!

Honestly I am so happy with this purchase! I live in an apt and have a patio but my neighbors didn't seem too appreciate of my goodnight blunt but this has helped so much!!! I can even smoke inside without having it stink up the living room. So amazing. I also love the packaging because when you plant the package it will decompose in three years a Read more aboutnd will also plant wildflowers :,) so if you're worried about the smell and convenience 10/10 I would recommend. Even for cig smokers!!

On PHREND

Kai W. Verified Buyer

★★★★★

COMES IN HANDY TO HAVE

Comes in handy to have multiple pieces in case I lose or forget one.

On PHREND

Kathryn W. Verified Buyer

★★★★★

PERFECT FOR WORKING MOM LIFE.

I got this originally for smoke breaks in my car and it works perfectly for that but I find myself using it everywhere. My spouse doesn't smoke and he appreciates it when I use it in the house now.

On POCKET

Naat'aanii Y. Verified Buyer

★★★★★

JUST SAY YES

This item is wonderful. I'm visiting family and want to use my medication without bothering anyone. I'm amazed at the fact no smell or smoke comes out. I believe it's a worthwhile investment and I plan to purchase more for my other family members.

On PHILIP

Victoria S. Verified Buyer

★★★★★

THE FILTER IS GREAT IT

The filter is great it makes it so much easier to smoke in my house without bothering anyone else I live with that doesn't like the smell

On POCKET

Lindsay K. Verified Buyer

★★★★★

SUPER EXCITED ABOUT REDUCING THE

super excited about reducing the amount of smoke in my house. got one for my friend as well and she loves it!

On POCKET

Karia P. Verified Buyer

★★★★★

WORKS AMAZINGLY!!

I have small kids and I smoke from a water pipe so I was so excited To find your product and even more excited when it worked so well! Thank you for making this product

On PHREND

Robert V. Verified Buyer

★★★★★

GREAT PRODUCT!!!!

Honestly idk how to start other then it's better then i expected, it works on vapor and bud smoke, I knew it was supposed to be good but it blew me away

On Route Package Protection

Samantha R. Verified Buyer

★★★★★

STAYED DRY DURING THE RAIN

Stayed dry during the rain

On Route Package Protection

Jade R. Verified Buyer

★★★★★

100% WORTH IT

I have IBS and thc relieves the pain. I love that I can medicate and not worry about the smell or smoke. Very useful on the go.

On 6 POKIETs Party Packi

Isabel L. Verified Buyer

★★★★★

I REALLY THINK IT MAKES A DIFFERENCE!

I just moved to an apartment that has a strict no smoking policy. Even though I have a medical card I didn't want the neighbors to be put off by the smell. The phrend is a godsend. As long as I use a glass pipe and not a roll then the smoke is kept to a minimum and what I exhale is barely detectable. Will be stocking up on filters soon

On PHREND

James B. Verified Buyer

★★★★★

AWESOME!

I'm old. Let's start with that one. I made my first sploof when I was in college (so nearly 28 years ago). It was a mountain dew bottle with the bottom cut off and stuffed with dryer sheets. It worked okay to keep my dorm room moderately skunk free, but it was far from perfect. Now I have two teenagers and I don't necessarily want them smelling he Read more aboutrb all over the house, so I smoke in the garage. It gets stuffy and skunky, and in the summer it's downright hot out there. Enter Philter.....my wife and I are able to smoke/vape in our room and the Phrend helps keep the smell down a lot. And it's so much cooler looking than a bottle or toilet paper roll. If you need to be discreet and not look like a total doofus, this is your guy!

ON PHREND 2-Packl Refills

Mayra j. Verified Buyer

★★★★★

MY HUSBAND AND I LIVE

My husband and I live in a small studio that when we smoke the smoke accumulate very quickly in the room and since using this product our room has stayed smoke free. I highly recommend this product. I use this along with my mooselab filter my smoking devices.

ON 3-PACK FILTER REFILLS