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Cigarette électronique : restrictions sur les saveurs

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Conseil
Supérieur de la Santé

AVIS DU CONSEIL SUPERIEUR DE LA SANTE N° 9863

Cigarette électronique : restrictions sur les saveurs

In this scientific advisory report, which offers guidance to public health policy-makers, the Superior Health Council of Belgium provides recommendations for a drastic and urgent restriction on e-cigarette flavours, aiming to reduce their appeal—particularly among young people—without increasing the threshold for smokers who use e-cigarettes as a smoking cessation aid.

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05/11/2025[1]

RÉSUMÉ

Dans cet avis scientifique, le Conseil supérieur de la santé (CSS) de Belgique fournit une évaluation complète des implications pour la santé publique des cigarettes électroniques aromatisées et formule des recommandations en matière de réglementation. L'avis aborde deux préoccupations principales : le profil toxicologique incertain des substances aromatisantes lorsqu'elles sont inhalées et l'attrait croissant des cigarettes électroniques auprès des jeunes, en partie en raison de la variété des saveurs disponibles. Il examine également le rôle potentiel des cigarettes électroniques aromatisées dans le sevrage tabagique chez les fumeurs adultes. Les conclusions et recommandations sont basées sur une revue narrative de la littérature scientifique, y compris des sources toxicologiques, comportementales, épidémiologiques et réglementaires.

Le nombre de saveurs disponibles pour les e-liquides est exceptionnellement élevé. En 2017, près de 20 000 e-liquides avec 250 descripteurs d'arômes distincts ont été identifiés sur le marché néerlandais. Au niveau mondial, on estime à plus de 7 000 le nombre de saveurs uniques pour e-liquides. Ces saveurs sont généralement composées de mélanges complexes et variables de nombreuses substances aromatisantes individuelles. Par exemple, une analyse réalisée en 2020 sur 129 e-liquides achetés sur le marché belge a identifié un total de 807 composés aromatisants différents. La transparence concernant la composition d'un e-liquide est encore compliquée par l'utilisation d'extraits de plantes dont la composition varie, et par le fait que la décision d'exécution (UE) 2015/2183 de la Commission autorise à considérer comme confidentiels ou comme secret commercial les ingrédients utilisés en quantités inférieures à 0,1 % de la composition finale de l'e-liquide.

De nombreuses substances aromatisantes utilisées dans les e-liquides, bien qu'autorisées pour la consommation orale, n'ont pas fait l'objet d'une évaluation adéquate de leur toxicité par inhalation.

[1] Le Conseil se réserve le droit de pouvoir apporter, à tout moment, des corrections typographiques mineures à ce document. Par contre, les corrections de sens sont d'office reprises dans un erratum et donnent lieu à une nouvelle version de l'avis.

Les exemples les plus connus de saveurs sans danger pour la consommation orale mais toxiques par inhalation sont les dicétones diacétyle et acétylpropionyle. Des études expérimentales démontrent que plusieurs saveurs induisent un stress oxydatif et présentent des effets cytotoxiques, génotoxiques et pro-inflammatoires, notamment dans les cellules épithéliales respiratoires humaines. Par exemple, le diacétyle, le 2,3-pentanedione et l'éthylvanilline sont connus pour induire la production d'espèces réactives de l'oxygène (ERO) et d'interleukine-8 (IL-8), entraînant une inflammation et un impact négatif sur la fonction pulmonaire. En outre, le diacétyle peut provoquer une bronchiolite oblitérante (poumon pop-corn). Le menthol est associé à une diminution de la fonction pulmonaire, tandis que son effet antiprurigineux peut entraîner une inhalation plus longue et une rétention d'autres substances cytotoxiques. En outre, les saveurs crémeuses contenant du cinnamaldéhyde présentent des risques plus élevés, car elles altèrent les réponses immunitaires anti-pathogènes, réduisent la clairance mucociliaire (ce qui accroît le risque d'infections respiratoires) et augmentent le stress oxydatif. Pour de nombreuses autres saveurs, on sait peu de choses sur leur toxicité par inhalation, et leurs effets cumulatifs « en mélange » ne peuvent pas non plus être correctement évalués. Le problème de l'incertitude toxicologique est encore exacerbé par le fait que le chauffage et les interactions chimiques pendant le vapotage peuvent générer des sous-produits nocifs, notamment des aldéhydes (par exemple, le formaldéhyde cancérigène, l'acétaldéhyde), des furanes et des acétals d'aldéhyde-propylène glycol, dont les propriétés toxicologiques restent largement inconnues.

De nombreuses études ont montré que l'utilisation de cigarettes électroniques (contenant de la nicotine) aggrave et augmente le risque de certains troubles et maladies respiratoires, allant de l'essoufflement à des symptômes de type bronchite, en passant par l'asthme, la bronchopneumopathie chronique obstructive (BPCO) et le syndrome de chevauchement asthme-BPCO (ACOS). En outre, les rapports de cotes combinés d'une étude suggèrent que la double consommation de cigarettes et de cigarettes électroniques est plus risquée que la consommation de cigarettes seules (maladies cardiovasculaires, accidents vasculaires cérébraux, dysfonctionnements métaboliques, asthme, BPCO, maladies bucco-dentaires).

Des études *in silico*, *in vitro* et *in vivo* sur différents aérosols aromatisés ou saveurs spécifiques ont mis en évidence des effets génotoxiques dans les cellules animales et humaines (par exemple, dégradation de l'ADN, cassures et formation d'adduits, mutagenèse, induction d'enzymes de réparation de l'ADN). En résumé, il est clair que les saveurs des cigarettes électroniques peuvent avoir des effets génotoxiques, mais on ignore dans quelle mesure ces effets peuvent survenir chez les utilisateurs de cigarettes électroniques. Si les études épidémiologiques restent peu concluantes quant à un lien direct entre l'utilisation de la cigarette électronique et le cancer du poumon, cette question devrait faire l'objet d'études plus approfondies à l'avenir, compte tenu de la longue période de latence nécessaire au développement du cancer du poumon et du lien avec des biomarqueurs liés au risque de cancer, tels que la dégradation de l'ADN et le stress oxydatif. Cependant, en 2025, le *Clinical Oncology Society of Australia* a fait le constat suivant au terme d'une évaluation qualitative des risques : « *Nicotine-based e-cigarettes are likely to be carcinogenic to humans who use them. E-cigarettes are likely to cause lung cancer and oral cancer.* ».

L'évaluation des saveurs est un processus complexe et long qui nécessite des analyses chimiques sophistiquées et des évaluations toxicologiques comportant de nombreuses incertitudes, de multiples critères d'évaluation potentiels et des stratégies de recherche. L'évaluation des risques est actuellement compliquée par les incertitudes liées à l'évaluation de l'exposition, l'absence de stratégies fiables d'évaluation des risques cumulatifs et le fait que la dégradation chimique des e-liquides due au chauffage n'est pas prise en compte. S'il incombe toujours aux fabricants de garantir la sécurité des produits avant leur mise sur le marché, cette logique n'est certainement

pas suivie dans la pratique aujourd'hui par les cigarettes électroniques disponibles sur le marché, alors que l'incertitude quant à la toxicité et à la sécurité des nombreuses substances reste élevée, et que de plus en plus de preuves scientifiques indiquent des risques pour la santé.

La prévalence croissante du vapotage chez les jeunes est alarmante. Selon la dernière enquête VAD *Flemish Pupil Survey* (2023 - 2024[2]) menée auprès des 12 - 18 ans, 29 % ont déjà utilisé des cigarettes électroniques, 24 % l'ont fait au cours de l'année écoulée et 9 % l'ont fait au moins une fois par semaine. La proportion d'utilisateurs réguliers est aujourd'hui plus de quatre fois supérieure à celle de 2018 - 2019. Les effets de la récente interdiction belge des cigarettes électroniques jetables et de leur affichage (toutes deux en 2025) sont encore inconnus. Si la curiosité est la principale motivation des jeunes pour commencer à vapoter, les données comportementales provenant de Belgique et d'autres pays montrent que les saveurs sont une raison importante de l'attrait des cigarettes électroniques chez les adolescents et les jeunes. Avec l'introduction de saveurs « tendance » et « cool » tels que le pop-corn, le *chewing-gum* et la barbe à papa, l'industrie du tabac et de la cigarette électronique tente spécifiquement d'atteindre les jeunes avec ses produits addictifs. Selon différentes enquêtes belges et internationales, les jeunes sont particulièrement attirés par les saveurs fruitées, les bonbons, les boissons et les desserts, ce qui peut réduire la perception des risques et augmenter la propension à l'expérimentation. Dans le même temps, les saveurs pourraient potentiellement renforcer l'attrait des cigarettes électroniques en tant qu'outil potentiel de sevrage tabagique. Il existe des preuves très fiables que les cigarettes électroniques contenant de la nicotine augmentent les taux d'arrêt (8 à 10 personnes sur 100 arrêtent de fumer) par rapport, par exemple, à la thérapie de substitution nicotinique (TSN) (6 personnes sur 100 arrêtent de fumer). Si les personnes de plus de 20 ans préfèrent également les saveurs fruitées, la plus grande différence avec les 10 - 20 ans réside dans l'attrait plus important des saveurs tabac et menthe chez les vapoteurs plus âgés. Les données fiables non financées par l'industrie sont rares sur les préférences des anciens fumeurs qui ont réussi à arrêter de fumer en utilisant la cigarette électronique comme outil temporaire d'aide au sevrage tabagique. Cependant, les rares données disponibles ne sont pas concluantes et ne montrent pas de lien clair entre l'utilisation des saveurs des cigarettes électroniques et les résultats en matière de sevrage tabagique.

Les Pays-Bas ont interdit toutes les saveurs des cigarettes électroniques à compter du 1er janvier 2024. Seule la saveur tabac est encore autorisée, sur la base d'une liste positive de 16 saveurs ayant fait l'objet d'une évaluation toxicologique avec analyse des risques. Ces 16 arômes peuvent être utilisés pour créer la saveur tabac. Les premiers résultats d'une enquête transversale menée par le *Rijksinstituut voor Volksgezondheid en Milieu* (RIVM) neuf mois après l'interdiction sont encourageants, montrant que 29,5 % des personnes interrogées ont réduit leur consommation de cigarettes électroniques et que 22,4 % ont arrêté de fumer, sans indication claire d'une substitution par des cigarettes. Cependant, l'application de la loi et les inspections restent essentielles, car un marché illégal continue de vendre des produits aromatisés. En revanche, les restrictions sur les saveurs dans certains États américains montrent un tableau mitigé, avec une baisse significative du vapotage, mais aussi des indications d'une substitution indésirable chez une minorité de vapoteurs qui sont revenus au tabac. Le législateur belge doit donc examiner attentivement les effets souhaités et indésirables afin de pouvoir anticiper ces derniers à l'avance avec des mesures d'accompagnement.

[2] *https://vad.be/content/uploads/2025/10/Syntheserapport-2023-2024_def_GL.pdf (accessed on 21 October 2025).*

Recommandation : une restriction drastique et urgente des saveurs

Compte tenu de toutes ces preuves et des principes d'hygiène physique et chimique de l'environnement (voir CSS 9404, 2019), **le Conseil Supérieur de la Santé recommande à l'unanimité une réduction urgente et drastique du nombre de saveurs disponibles pour les cigarettes électroniques**. Deux positions se dégagent au sein du Conseil :

1) **D'un point de vue toxicologique et de précaution, une partie du groupe de travail préfère une interdiction des saveurs basée sur le modèle néerlandais, qui autorise uniquement la saveur tabac.** Cette saveur tabac peut être composée uniquement à partir d'une liste positive de 16 saveurs, pour lesquelles les informations disponibles à l'heure actuelle sont insuffisantes pour démontrer des effets nocifs.

   Plusieurs études recommandent une telle interdiction. L'avantage de cette approche est qu'elle permet d'harmoniser la réglementation avec celle des Pays-Bas, et éventuellement d'autres États membres de l'UE à l'avenir, ce qui facilite son application. Si cette option est retenue, la liste positive devra être réévaluée régulièrement à mesure que de nouvelles données toxicologiques et autres seront disponibles.

2) **Du point de vue du sevrage tabagique, une autre partie du groupe de travail préfère autoriser quelques saveurs supplémentaires en plus de la saveur tabac (généralement ≤ 3).** Ils proposent cette option par crainte que les cigarettes électroniques ne perdent leur attrait en tant qu'outil potentiel pour aider certains fumeurs à arrêter de fumer et pour empêcher certains vapoteurs de revenir à la cigarette classique, comme cela a été observé dans certains États américains après l'instauration de restrictions sur les saveurs. Cependant, les données actuelles ne sont pas concluantes et ne montrent pas de lien clair entre l'utilisation de saveurs dans les cigarettes électroniques et les résultats en matière de sevrage tabagique ou l'utilisation à long terme des cigarettes électroniques, bien que peu d'études soient disponibles.

   Si des saveurs supplémentaires doivent être autorisées, elles devraient être sélectionnées sur la base d'une enquête menée auprès d'anciens fumeurs (belges) qui ont réussi à arrêter de fumer grâce à la cigarette électronique et ont ensuite cessé de vapoter. Les saveurs sélectionnées devraient être aussi peu attrayantes que possible pour les jeunes. Une telle étude n'étant actuellement pas disponible, elle devrait être menée avant la sélection. Après la sélection des saveurs, une liste positive de substances aromatisantes pour la formulation des saveurs devrait être établie à l'aide d'une méthodologie comparable à celle employée par le RIVM pour la saveur tabac.

Ces deux positions sont scientifiquement fondées, mais elles sont limitées par le manque de données disponibles. La décision finale appartient aux décideurs politiques. **Il est toutefois évident que les préférences individuelles des adultes ne sauraient primer sur la protection de la jeunesse à l'échelle de la population. Les preuves scientifiques existantes sont suffisamment solides pour justifier une action réglementaire immédiate.**

Afin de garantir la mise en œuvre effective de restrictions strictes en matière de saveurs, le CSS recommande vivement d'intensifier considérablement les efforts de contrôle. D'après l'expérience de la *Nederlandse Voedsel- en Warenautoriteit* (NVWA) aux Pays-Bas, les principaux défis consistent à lutter contre le commerce illégal, à prouver les ventes non conformes et à lutter

contre la vente d'accessoires aromatisés (par exemple, les boules aromatiques et les embouts buccaux). Les inspections doivent cibler les importateurs et les points de vente au détail, tandis que les plateformes en ligne et les réseaux sociaux doivent faire l'objet d'une surveillance étroite afin de détecter les ventes et les publicités illégales, les violations identifiées devant être signalées et supprimées. En outre, les contrôles d'âge dans les points de vente doivent être renforcés par le recours à des clients mystères.

Enfin, le CSS préconise également la diplomatie avec les pays voisins afin de coordonner les politiques et d'empêcher les achats transfrontaliers.

Autres recommandations :

- Le CSS recommande de modifier la législation nationale et/ou européenne existante afin que tous les nouveaux produits nicotiniques qui ne sont pas reconnus médicalement soient soumis aux lois existantes sur les produits du tabac ou soient complètement interdits de commercialisation. De cette manière, les décideurs politiques en matière de santé peuvent garder une longueur d'avance sur l'industrie du tabac afin d'éviter de nouveaux problèmes à l'avenir, dont les dommages doivent être limités « *a posteriori* », comme c'est le cas avec les cigarettes électroniques.

- Le CSS recommande de surveiller et de suivre de près les effets d'une interdiction ou limitation des saveurs après la mise en œuvre de ces mesures, afin de pouvoir affiner la politique par la suite. La liste positive des saveurs autorisées doit être évolutive afin de pouvoir réagir rapidement aux nouvelles informations, dans un sens ou dans l'autre.

- Le CSS recommande de lancer une campagne d'information à l'intention des vapoteurs à la date d'entrée en vigueur des restrictions sur les saveurs afin de les empêcher de revenir aux cigarettes traditionnelles, comme cela a été observé dans certains États américains.

- Le CSS accepte d'interdire la présence d'agents rafraîchissants synthétiques (par exemple WS-23) dans les e-liquides, en vertu de l'article 7.6d de la directive 2014/40/UE et de l'article 4, § 4, 5° de l'arrêté royal du 28/10/2016 (interdisant les additifs qui facilitent l'inhalation ou l'absorption de nicotine). Leur présence peut nuire à l'efficacité des interdictions relatives aux saveurs. Ceux-ci devraient être explicitement interdits.

- Le CSS recommande d'interdire tous les accessoires aromatisés tels que les boules aromatiques et les embouts buccaux, car leur utilisation peut nuire à l'efficacité des restrictions relatives aux saveurs.

- Le CSS recommande d'interdire les e-liquides à préparer soi-même (DIY), car ils sont encore moins standardisés et peuvent donc présenter de graves risques pour la santé. Dans le cadre d'une préparation DIY, le vapoteur crée son propre liquide en mélangeant des saveurs concentrées, un booster de nicotine et une base PG/VG.

- Le CSS recommande (déjà dans son rapport consultatif n° 9549) d'indiquer une durée maximale d'utilisation après ouverture sur les flacons de e-liquide, en tenant compte de la stabilité et de la durabilité des e-liquides (par exemple, la sensibilité de la nicotine à la

lumière). L'objectif est de minimiser la formation de produits de dégradation dans les e-liquides et de garantir le maintien de la concentration en nicotine déclarée.

- Le CSS recommande de normaliser l'emballage des cigarettes électroniques et des e-liquides et de rendre l'emballage aussi neutre que possible. Ces mesures réduisent l'attrait pour les jeunes.

- Le CSS recommande d'intensifier considérablement la lutte contre le commerce et le marché illégaux des cigarettes électroniques, y compris en ligne. Cela est essentiel pour garantir que d'autres mesures soient également mises en œuvre dans la pratique.

- Le CSS recommande de mettre en place davantage de campagnes de prévention mettant en avant les dangers du tabac et des cigarettes électroniques, en ciblant spécifiquement les jeunes. En outre, les parents devraient également être encouragés à arrêter de fumer et de vapoter, afin de montrer l'exemple. Le comportement des jeunes en matière de tabagisme et de vapotage est étroitement lié à celui de leurs parents.

- Le CSS recommande d'encourager la recherche indépendante afin de déterminer et de quantifier l'impact réel à long terme des cigarettes électroniques (tant sur la santé que sur le sevrage tabagique).

- Le CSS recommande que le numéro de téléphone de la ligne d'aide « *Tabacstop* » soit également obligatoire sur l'emballage des cigarettes électroniques (080011100).

- Le CSS recommande que le mot « nicotine », le message d'avertissement qui l'accompagne et la concentration en nicotine soient indiqués plus clairement et en caractères plus grands sur l'emballage des cigarettes électroniques et de tous les autres produits contenant de la nicotine. En outre, outre le message d'avertissement sur la nature addictive de la nicotine, un autre avertissement sur son caractère « dangereux » ou « toxique » devrait être ajouté.

- Le CSS recommande que, pour protéger l'environnement, la politique se concentre également sur le recyclage et la sensibilisation aux cigarettes électroniques et à leurs composants dans les déchets.

Certaines recommandations spécifiques sont également formulées concernant les produits du tabac traditionnels :

- Le CSS recommande de poursuivre la promotion d'autres aides au sevrage tabagique fondées sur des données probantes. Celles-ci devraient être rendues plus accessibles. Il convient donc d'étudier si certaines de ces aides peuvent être remboursées, en totalité ou en partie, en particulier pour les populations socio-économiquement vulnérables.

- La cigarette électronique est une source de préoccupation pour le CSS, mais cela ne doit pas détourner l'attention de la nécessité d'intensifier la lutte contre le tabagisme traditionnel. Environ 80 à 90 % des cancers du poumon et de la mortalité associée sont attribuables au tabagisme, et les fumeurs ont 20 fois plus de risques de développer un cancer du poumon que les non-fumeurs. Les risques augmentent avec la durée (nombre d'années) et la

quantité fumée (nombre de cigarettes par jour) et plus l'âge auquel on commence à fumer est jeune. La grande majorité des cancers du poumon peuvent donc être évités en ne commençant pas à fumer, mais aussi en arrêtant de fumer. Les initiatives en faveur de l'arrêt du tabac devraient donc être encore développées et soutenues, et la disponibilité et l'accessibilité des cigarettes traditionnelles devraient être encore restreintes.

- Le CSS recommande de restreindre fortement les points de vente des cigarettes classiques et de tous les autres produits non médicaux contenant de la nicotine (y compris les cigarettes électroniques).

- Le CSS recommande de poursuivre les efforts au niveau européen pour interdire les filtres de cigarettes.

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I. INTRODUCTION ET QUESTION

Le 6 décembre 2024, le Conseil supérieur de la santé (CSS) a reçu une demande d'avis au nom de la DG Animaux, Végétaux et Alimentation du SPF Santé publique, Sécurité de la Chaîne alimentaire et Environnement (SPF SSCE) concernant la réduction de l'attractivité des cigarettes électroniques, principalement sur une éventuelle réduction des saveurs autorisées/substances aromatisantes autorisées, et si une réduction est appropriée, comment celle-ci peut être mise en œuvre de manière optimale.

Cette demande d'avis a été reformulée le 17 juin 2025 par le Ministre des Affaires sociales et de la Santé publique, Frank Vandenbroucke. Sur la base de la Loi du 24 janvier 1977 « relative à la protection de la santé des consommateurs en ce qui concerne les denrées alimentaires et les autres produits», l'avis du CSS est sollicité sur la mesure dans laquelle une interdiction des saveurs pour les cigarettes électroniques, sur le modèle néerlandais, pourrait contribuer à la protection de la santé publique, et plus précisément sur l'impact de ces restrictions en matière de saveurs sur la consommation (ou l'initiation à la consommation) de produits nicotiniques par les jeunes. Depuis le 1er janvier 2024, seules les saveurs de tabac figurant sur une liste positive de 16 saveurs acceptées sont autorisées pour les cigarettes électroniques aux Pays-Bas. Si le CSS conclut que le modèle néerlandais n'est pas l'approche la plus appropriée, le ministre a demandé qu'une alternative détaillée soit proposée. L'avis a été demandé pour le 31 octobre 2025.

Par le passé, le CSS a abordé la question des cigarettes électroniques à plusieurs reprises. Cependant, le problème devient de plus en plus urgent. La prévalence croissante du vapotage chez les jeunes est alarmante. Selon la dernière enquête que le VAD a menée auprès des élèves flamands (2023 - 2024)[3] de 12 à 18 ans, 29 % ont déjà utilisé des cigarettes électroniques, 24 % l'ont fait au cours de l'année écoulée et 9 % l'ont fait au moins une fois par semaine. La proportion d'utilisateurs réguliers est aujourd'hui plus de quatre fois supérieure à celle de 2018 - 2019. Les effets de la récente interdiction des cigarettes électroniques jetables et de l'interdiction d'affichage (toutes deux en 2025) sont encore inconnus. Cet avis complète donc les rapports précédents (CSS 9549, 2022 ; CSS 9827, 2025) et recommande l'introduction de restrictions drastiques sur le nombre de saveurs autorisées pour les e-liquides. Des mesures supplémentaires sont également proposées.

Avant cet avis, le CSS souligne l'importance de mesures supplémentaires dans la lutte contre le tabagisme. La littérature sur le tabagisme et le vapotage devra être suivie de près dans les années à venir, compte tenu de l'évolution rapide de ce domaine de recherche.

[3] *https://vad.be/content/uploads/2025/10/Syntheserapport-2023-2024_def_GL.pdf (accessed on 21 October 2025).*

II. MÉTHODOLOGIE

Après analyse de la demande, le Collège et les présidents des domaines Santé mentale et facteurs chimiques environnementaux ont identifié les expertises nécessaires. Sur cette base, un groupe de travail *ad hoc* a été constitué, au sein duquel des expertises des disciplines suivantes étaient représentées : chimie analytique, toxicologie, pneumologie, oncologie, prévention du cancer, dépistage du cancer, carcinogenèse, pharmacie, médecine générale, addiction, psychiatrie, psychologie, prévention du tabagisme, sevrage tabagique, communication. Les experts de ce groupe ont rempli une déclaration générale et *ad hoc* d'intérêts et la Commission de Déontologie a évalué le risque potentiel de conflits d'intérêts.

L'avis est basé sur une revue de la littérature scientifique, publiée à la fois dans des journaux scientifiques et des rapports d'organisations nationales et internationales compétentes en la matière (*peer-reviewed*), ainsi que sur l'opinion des experts.

Après l'approbation de l'avis par le groupe de travail, le Collège a validé l'avis en dernier ressort.

Keywords and MeSH *descriptor terms*[4]

MeSH terms*	***Keywords***	***Sleutelwoorden***	**Mots clés**	***Schlüsselwörter***
Electronic Nicotine Delivery Systems	*Electronic cigarette*	*Electronische sigaret*	Cigarette électronique	*Zigarette elektronische*
Tobacco	*Tobacco*	*Tabak*	Tabac	*Tabak*
Behavior, addictive	*Addiction*	*Verslaving*	Assuétude	*Sucht*
Smoke	*Smoke*	*Roken*	Fumer	*Rauchen*
Nicotine	*Nicotine*	*Nicotine*	Nicotine	*Nikotin*
Cessation, smokeless tobacco	*Smoking cessation*	*Stoppen met roken Tabaksontwenning*	Arrêt tabagisme	*Raucherentwöhnung*
Cigarettes	*Cigarette*	*Sigaret*	Cigarette	*Zigarette*
	Vaping	*Vapen*	Vapoter	*Dampfen*

MeSH (Medical Subject Headings) is the NLM (National Library of Medicine) controlled vocabulary thesaurus used for indexing articles for PubMed: http://www.ncbi.nlm.nih.gov/mesh.

[4] *The Council wishes to clarify that the MeSH terms and keywords are used for referencing purposes as well as to provide an easy definition of the scope of the advisory report. For more information, see the section entitled "methodology".*

Liste des abréviations utilisées (Anglais)

ACGIH	*American Conference of Governmental Industrial Hygienists*
ACOS	*Asthma-COPD-Overlap Syndrome*
ALARA	*As Low As Reasonably Achievable*
BMDL	*Benchmark Dose Lower Confidence Limit*
COPD	*Chronic Obstructive Pulmonary Disease*
CI	*Confidence Interval*
CBD	*Cannabidiol*
CLP	*Classification, Labelling, Packaging*
CMR	*Carcinogenic, Mutagenic, Reprotoxic*
CT	*Computed Tomography*
DG	*Directorate-General*
DIY	*Do-It-Yourself*
DNA	*Deoxyribonucleic Acid*
ECHA	*European Chemicals Agency*
EFSA	*European Food Safety Authority*
ENDS	*Electronic Nicotine Delivery System*
EPA	*Environmental Protection Agency*
EU	*European Union*
EU-CEG	*European Union Common Entry Gate*
FARES	Fonds des Affections Respiratoires
FCTC	*WHO Framework Convention on Tobacco Control*
FEMA	*Federal Emergency Management Agency*
FEV1/FVC	*Forced Expiratory Volume in 1 second / Forced Vital Capacity*
FOD VVVL	*Federale Overheidsdienst Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu*
GC-MS	*Gas Chromatography and Mass Spectrometry*
GHS	*Globally Harmonised System*
HS GC-MS	*Headspace Gas Chromatography – Mass Spectrometry*
IARC	*International Agency for Research on Cancer*
IL-8	Interleukin-8
JECFA	*Joint FAO/WHO Expert Committee on Food Additives*
LC	*Liquid Chromatography*
MRI	*Magnetic Resonance Imaging*
MoE	*Margin of Exposure*
NOAEC	*No-observed Adverse Effect Concentration*
NOAEL	*No-observed Adverse Effect Level*
NRT	*Nicotine Replacement Therapy*
NVWA	*Nederlandse Voedsel- en Warenautoriteit*
OR	*Odds Ratio*
PG	*Propylene Glycol*
PoD	*Point of Departure*
pOR	*pooled Odds Ratio*
pRR	*pooled Relative Risk*
(Q)SAR	*(Quantitative) Structure-Activity Relationship*
REACH	*Registration, Evaluation, Authorisation and Restriction of Chemicals*
RCT	*Randomised Controlled Trial*
RD	*Royal Decree*
ROS	*Reactive Oxygen Species*

RIVM	*Rijksinstituut voor Volksgezondheid en Milieu*
RR	*Relative Risk*
SCHEER	*Scientific Committee on Health, Environmental and Emerging Risks*
SHC	*Superior Health Council*
THC	*Tetrahydrocannabinol*
TTC	*Threshold of Toxicological Concern*
US	*United States of America*
VAD	*Vlaams Expertisecentrum Alcohol en andere Drugs*
VG	*Vegetable Glycerine*
VOC	*Volatile Organic Compound*
WHO	*World Health Organization*

III. ELABORATION ET ARGUMENTATION

1. The e-cigarette and the Belgian Superior Health Council

An e-cigarette (Electronic Nicotine Delivery System, ENDS) consists of three basic components:

- a reservoir of e-liquid (cartridge);
- an element that brings the e-liquid into vapor phase by means of heating (atomiser);
- a battery.

A large variety of e-cigarette devices exists (see amongst others Schaap et al., 2023; Petrella et al., 2025).

The e-liquid is typically a mixture of propylene glycol (PG) and (vegetable) glycerin (VG), which act as carriers of nicotine and flavourings in aerosol formation. After heating the e-liquid, the vapour comes into contact with cold air, which the user inhales through the device, and condenses into a visible white aerosol. Small amounts of water or organic solvents such as ethanol are sometimes added, as well as a whole range of possible flavouring chemicals. The range of flavours is very extensive (see e.g. Havermans et al., 2021) and often involves mixtures of different flavourings. In order to classify e-liquid flavours with a shared vocabulary, Krüsemann et al. (2019) distinguished 13 main categories (tobacco, menthol/mint, nuts, spices, coffee/tea, alcohol, other beverages, fruit, dessert, candy, other sweets, other flavours, and unflavoured), and 90 subcategories (Figure 1).

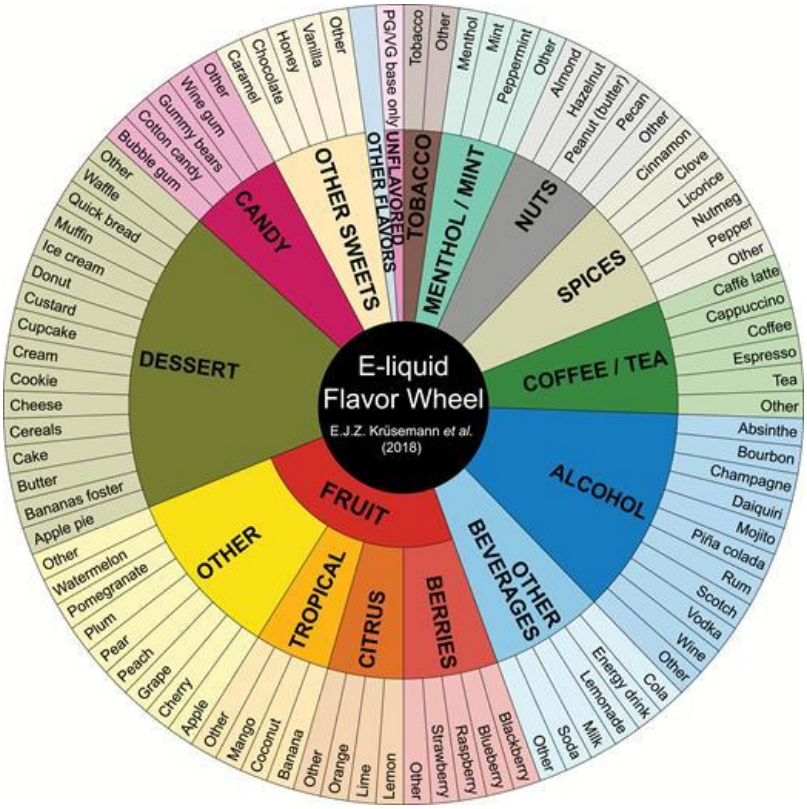

Figure 1. *Flavour wheel, proposed by Krüsemann et al. (2019: fig. 2) for the classification of e-liquid flavours. Copyright Nicotine & Tobacco Research.*

Given the increase of vaping prevalence, especially among youth and young adults, the SHC has provided recommendations on this topic in the past. An extensive advisory report was published in 2022 SHC (9549, 2022). Recently, in 2025, a brief literature overview based on SHC 9549 was updated, and warning messages were developed for inserts that need to be included in the e-cigarette packaging (SHC 9827, 2025).

The general position of the SHC on e-cigarettes, formed after a balanced discussion with experts from various disciplines, can be summarised in the first three warning messages for the package insert:

- A health life = no smoking, no vaping,

- E-cigarettes are strongly discouraged for non-smokers, especially young people and young adults (<25 years) and pregnant women.

- E-cigarettes can be used as a possible aid for adult smokers to quit smoking, preferably under the supervision of a health professional.

However, the working group is well aware that there are many different products available on the internet. In this advice, we focus specifically on those products on the legal market that are under the control of the legislator and for which further measures can be taken. Appropriate control and enforcement must be stepped up for illegal sales. Especially since illegal e-cigarettes with tetrahydrocannabinol (THC) and even synthetic cannabinoids are also circulating among teenagers in our country [5].

2. E-cigarette flavours: regulation

The composition of e-cigarettes and e-liquids is specifically regulated by the Royal Decree of 28/10/2016 "*betreffende het fabriceren en het in de handel brengen van e-sigaretten*", which transposes Article 20 of Directive 2014/40/EU.

The liquid does not contain any of the following additives:

- vitamins or other additives that give the impression that an e-cigarette offers health benefits or poses fewer health risks. The interpretation of this provision means that the presence of CBD and vitamin E acetate, for example, is prohibited (exclusively in liquids containing nicotine);
- caffeine or taurine or other additives and stimulating chemical compounds associated with energy and vitality;
- additives that color emissions;
- additives that have CMR characteristics in unburned form.
- additives that facilitate the inhalation or absorption of nicotine

Commission Implementing Decision (EU) 2015/2183 stipulates that ingredients used in quantities exceeding 0.1 % of the final composition of the e-liquid shall not be considered confidential or a trade secret.

[5] https://www.vrt.be/vrtnws/nl/2025/04/22/drugs-vapes-synthetische-cannabis-pano-onderzoek-belgie-tieners/ (accessed on 21 October 2025).

3. E-cigarette flavours: toxicity and health effects

Note: This chapter has been partially reproduced and updated from Chapter 2 of SHC (9781, 2025). For the toxicity and effects of nicotine, we refer to this report.

The flavours used in e-cigarettes are usually made of synthetic flavouring chemicals that are allowed in food. Overall, there is not much qualitative research on the clinical effects of inhalation of flavourings via vaping and more studies are needed (Royal College of Physicians, 2024). The largest review on the possible risks of flavours concluded that flavourings may lead to health risks for the user, but that the available evidence for this remains limited for the time being. However, current data on the toxic effects of flavours in particular are mainly from *in vitro* research with limited *in vivo* experiments being performed (Livingstone-Banks et al., 2025). For most of the flavouring chemicals, evaluations are available as food flavourings via EFSA in the EU (Barhdadi et al., 2021) or FEMA in the US (Jabba & Jordt, 2019). However, this does not take into account the inhalation toxicity of these flavourings. In addition, it is not known which potential reaction products can be formed after heating and whether interaction products are formed in the mixture. The effects of all the potentially generated products are also unknown. The evaluations by the official institutions do provide the necessary information on potential CMR properties (carcinogenic, mutagenic, or toxic for reproduction) of the flavourings, as these properties are independent of the route of exposure.

Higher cytotoxic effects have been observed at higher concentrations of aromas (Hua et al., 2019; Omaiye et al., 2020). In addition, it has been found that sweet flavours in particular contain more flavouring chemicals than tobacco and menthol flavours (Czoli et al., 2019) and that creamy flavours and flavours with cinnamaldehyde in particular would pose higher risks (McNeill et al., 2022; Royal College of Physicians, 2024). According to Leigh et al. (2016), flavourings significantly affect inhalation toxicity of aerosol generated from ENDS. In this study, a strawberry-flavoured product appeared to be the most cytotoxic (followed by menthol and coffee flavours), decreasing cell viability, metabolic activity and release of cytokines in H292 human bronchial epithelial cells (Leigh et al., 2016). Flavouring chemicals such as diacetyl, 2,3-pentanedione, ethylvanillin are known to induce the production of ROS and interleukin-8 (IL-8), leading to inflammatory reactions and a negative impact on lung function (Petrella et al., 2025). Free radical formation by dipentene (racemic limonene), ethyl maltol, citral, linalool, and piperonal showed a dose-response relationship in the study by Bitzer et al. (2018), while ethylvanillin inhibited radical formation. The antipruritic effect of the flavouring menthol can lead to longer inhalation of aerosols, which can increase the retention of cytotoxic substances (Petrella et al., 2025).

In addition, attention should also be paid to the heating products of aromas (Royal College of Physicians, 2024). When studying the heating products of flavoured e-cigarettes, Khlystov & Samburova (2016) found a correlation between the formation of toxic aldehydes and the amount of flavouring compounds in e-liquids. The results of these experiments have not been confirmed since then (see e.g. Klager et al., 2017). However, the flavoured formulations tested by Gillman et al. (2020) resulted in an increase of 150 % - 200 % in acetaldehyde. Such studies should be carried out more often in order to gain more insight into the type of flavourings to which this applies. The heating of sucrose and glucose-containing liquids would also lead to the formation of the toxic furans: 5-hydroxymethylfurfural and furfural. In addition to heating products, interaction products are also possible as a result of reaction between the different chemicals in a mixture (Soussy et al., 2016). Erythropel et al. (2019) described the formation of aldehyde-propylene glycol acetal adducts formed in an e-liquid matrix with flavouring chemicals such as benzaldehyde, cinnamaldehyde,

citral, ethylvanillin and vanillin. The toxicological properties of these newly formed products should also be evaluated.

3.1 Genotoxicity/Carcinogenicity

All substances with CMR properties are prohibited in e-liquids, regardless of whether or not they are present in the aerosols. Several evaluations are already available for genotoxicity and carcinogenicity of the different flavourings, in particular the EFSA opinions. Studies show that e-liquids can contain genotoxic components such as: safrole, estragole, furylmethyl ketone, dimethylhydroxyfuranone, and pulegone (Jabba & Jordt, 2019; Barhdadi et al., 2021). For some flavourings, there are indications that they would have CMR properties or there are insufficient data to rule out genotoxicity. These should be further evaluated *a priori* (Liu et al., 2017; Barhdadi et al., 2021b; Kang et al., 2020). It should be noted that there are several weights of evidence for the data used to evaluate whether a chemical can be considered CMR. There is the (harmonized) CLP labelling (classification, labelling and packaging), IARC classification, individual experimental results, etc.

The literature on genotoxic properties of the e-cigarette liquids is rather limited. The study by Tommassi et al. (2017) found no significant increase in the number of mutations in mouse or human cells *in vitro* after exposure to e-cigarette vapour. The increased expression of enzymes activating procarcinogens to carcinogens was observed in human keratinocytes *in vitro* by Sun et al. (2019) and *in vivo* in rats by Canistro et al. (2017). DNA adduct formation by flavouring chemicals was predicted by *in silico* research by Kang et al. (2020). Oxidative stress after exposure to e-cigarette aerosols was observed in mice and is reported in cells of the head, neck, and mouth in humans (Platel et al., 2022; Wilson et al., 2022). Induction of DNA repair enzymes was observed in mice *in vivo* and in human cells *in vitro* (Lee et al., 2018). DNA breaks or other forms of DNA damage were detected on mammalian and human cells *in vitro* (Holliday et al., 2016; Lee et al., 2018) and *in vivo* in animals by Canistro et al. (2017), Platel et al. (2022) and Espinoza-Derout et al. (2022) and in Human Mouth Cells by Cheng et al. (2022). Mutations were observed in mice *in vivo* by Espinoza-Derout et al. (2022) and Platel et al. (2022) and *in vivo* in rats by Canistro et al. (2017). An increase in the number of micronuclei was observed in rats *in vivo* (Canistro et al., 2017). Tommassi et al. (2023) demonstrated a dose-dependent formation of DNA Damage in oral cells from vapers who had never smoked tobacco cigarettes. Moreover, users of sweet-, mint or menthol-, and fruit-flavoured e-liquids showed the highest levels of DNA damage, compared to nonusers. In summary, it is clear that compounds of e-cigarettes can have genotoxic effects, but we do not know to what extent these effects may occur in e-cigarette users.

To date, most studies have not shown a significant association between e-cigarette use and lung cancer (Petrella et al., 2025; Kundu et al., 2025). However, there is substantial evidence that exposure to the e-cigarette is associated with biomarkers related to cancer risk, such as DNA damage and oxidative stress (Allbright et al., 2024; Kundu et al., 2025). The *Scientific Committee on Health, Environmental and Emerging Risks* (SCHEER, 2021) assessed the evidence for carcinogenic effects in the respiratory tract from long-term, cumulative exposure to nitrosamines, acetaldehyde and formaldehyde as weak to moderate. However, in 2025 , after a qualitative risk assessment, the Clinical Oncology Society of Australia made the following assessment: "*Nicotine-based e-cigarettes are likely to be carcinogenic to humans who use them. E-cigarettes are likely to cause lung cancer and oral cancer*" (Stewart, 2025). Given that many experimental studies have shown oxidative stress, inflammation and genotoxicity (see above) and given the long latency time for the development of lung cancer (often longer than the time in which the e-cigarette

has been used to date), this should be further followed up in the future in qualitative, longitudinal epidemiological research. At the moment, preliminary reports from a Korean cohort study found a significant association between smokers who switched to the e-cigarette and a higher risk of lung cancer and associated mortality. This effect was more pronounced in high-risk individuals for whom it is likely recommended to participate in low-dose CT screenings) (Kim et al., 2024). Besides, several preclinical studies have reported that acute exposure to vaping may accelerate the progression of some cancers (e.g., brain tumors, bladder cancer, oral squamous cell carcinoma) (Petrella et al., 2025).

3.2 Inhalation toxicity

Special attention should be paid to the toxicity of flavourings by inhalation and especially to their toxicity on the lung epithelium. It should be noted that exposure limits of different substances set for e.g. occupational exposure should not be directly compared with the inhalation of chemicals through the use of the e-cigarette, as the exposure pattern is different (Hubbs et al., 2015), and heating takes place.

The most well-known example of flavourings that are safe for oral use but cause inhalation toxicity are the diketones: diacetyl and acetylpropionyl. Diacetyl is known to cause bronchiolitis obliterans or "*popcorn lung*" when inhaled (Cao et al., 2020). Furthermore, dose-dependent *in vitro* neurotoxic effects have been observed with both compounds (Das & Smid, 2019). E-cigarette menthol flavouring is associated with decreased lung function (reduced FEV1 % predicted and FEV1/FVC independent of age, gender, race, pack-years of smoking, and use of nicotine or cannabis-containing vaping products) in combustion cigarette smokers (Chandra et al., 2023). Another much-discussed flavouring is cinnamaldehyde. This flavouring chemical was found to be cytotoxic in several *in vitro* experiments. In addition, it would suppress the ciliary motility of the bronchial epithelial cells and therefore increase the risk of respiratory infections (Clapp et al., 2017, 2019). Other examples described in the literature are benzyl alcohol, benzylaldehyde, vanillin, banana oil, 3-hexen-1-ol acetate, 4-methyl-2-phenyl-1,3-dioxolane, 5-heptyldihydro-2(3H)-furanone, 2-propenyl ester hexanoic acid and benzaldehyde propylene glycol acetal (Czoli et al., 2019; Girvalaki et al., 2018). These flavouring substances were also found in e-liquids and contain an indication that inhalation of these aromas would be toxic. The inhalation toxicity was indicated by, in the best case, a harmonised GHS classification (Globally Harmonised System) or, in doubtful cases, by self-notified GHS classification.

In addition to irritation in the upper respiratory tract (see e.g. SCHEER, 2021), vaping has been shown to worsen or increase the likelihood of certain respiratory diseases. Passive exposure to nicotine-containing vape aerosols with different flavouring chemicals is not harmless. In young adults, it is associated with an increased risk of bronchitis-like symptoms and shortness of breath (Islam et al., 2022). Vaping is associated with an increased risk of COPD. A short-term study found that mice exposed to nicotine-containing e-cigarette aerosols were more likely to experience symptoms associated with the onset of COPD than mice that were not exposed (Garcia-Arcos et al., 2016). A large cross-sectional study in 2019 found that e-cigarette use in humans was associated with an odds ratio (OR) of 1.75 (95 % CI: 1,25 - 2,45) on chronic bronchitis, emphysema or COPD (all three) compared to people who had never used e-cigarettes. The OR even increased to 2.64 (95 % CI: 1,43 - 4,89) among daily e-cigarette users (Osei et al., 2020). Another study showed similar results: compared to people who never use e-cigarettes, e-cigarette users had a significantly increased OR of asthma-COPD-overlap syndrome (ACOS), asthma and COPD (ORs 2.27, 1.26, 1.44, respectively) (Bircan et al., 2021). In 2025, two more meta-analyses were

published showing that e-cigarette users have a higher risk of developing COPD, compared to people who do not smoke or vape. The stratified analyses by Song et al. (2025) of cross-sectional studies only (pOR = 1.55, 95 % CI: 1.26 - 1.84) and of prospective cohort studies only (pRR = 1.52, 95 % CI: 0.98-2.06) showed that e-cigarette users are significantly more likely to develop COPD. The meta-analysis by Malvi et al. (2025) distinguished between patterns of use over time. The pooled OR for current users of nicotine-containing e-cigarettes and COPD risk was 1.488 (95 % CI: 1.363 - 1.623), 1.839 for former users (95 % CI: 1.513 - 2.234) and 1.787 (95 % CI: 1.421 - 2.247) for people who have ever used an e-cigarette. Given the corrections made for tobacco use in the various selected studies, these results underline that nicotine-containing vapes contribute to the risk of COPD, regardless of tobacco use. Unfortunately, specific studies for vapes without nicotine seem to be lacking. Compared to the risk of COPD when smoking cigarettes, the risk of COPD with the e-cigarette is lower. In addition, dual use seems to be even riskier: in the study of Glantz et al. (2024), pooled odds ratios for dual use versus cigarettes were increased for all outcomes (range 1.20 to 1.41 for cardiovascular disease, stroke, metabolic dysfunction, asthma, COPD, oral disease).

For more information on the pulmonary effects of vaping (pulmonary cytotoxicity, lung inflammation, anti-pathogen immune response, mucociliary function, oxidative stress and DNA damage, matrix remodeling and emphysema, airway hyperresponsiveness, other lung diseases), we refer the reader to the extensive review by Allbright et al. (2024). Concerning flavours, it was concluded by these authors that cinnamon, tobacco, and mint/menthol flavourings enhance cytotoxicity and induce lung inflammation compared with other flavourings and the absence of flavourings (Allbright et al., 2024):

- cinnamon flavourings (especially cinnamaldehyde) impair anti-pathogen immune responses, reduce mucociliary clearance, and enhance oxidative stress.
- (some) tobacco flavourings induce oxidative stress, airway hyperresponsiveness, and DNA damage.
- mint/menthol flavourings have been associated with increased DNA damage.

3.3 (Cardio)vascular effects

While (cardio)vascular effects linked to nicotine in cigarettes and e-cigarettes are well known (see e.g. Whitehead et al., 2021; McNeill et al., 2022; SCHEER, 2022), there are far fewer studies available on the effects of the flavourings in the e-cigarette itself. An experimental study with MRI images showed acute, adverse effects on endothelial function in healthy non-smokers after inhaling the aerosol of nicotine-free e-cigarettes (Caporale et al., 2019). However, further studies are needed on possible long-term effects (Caporale et al., 2019; McNeill et al., 2022).

3.4 Respiratory sensitisation

"Respiratory sensitisation" is a toxicological endpoint that is currently not being given much attention in e-cigarette research. Nevertheless, cases of allergic reactions were reported after using the e-cigarette (Clapp et al., 2017, 2019). Skin sensitisation, also known as type IV delayed cell-mediated hypersensitivity, would also play a role in exposure to flavours in e-cigarettes. There is already a series of well-known fragrances, used in cosmetics, which are known for their allergenic properties. It is being investigated whether these substances can also induce a sensitisation process through inhalation. A study by the Dutch National Institute for Public Health and the Environment (RIVM) has shown that iso-eugenol can indeed lead to negative effects in the respiratory system via inhalation (Ter Burg et al., 2014). However, it is unclear whether this applies

to all allergenic fragrances (Basketter & Kimber, 2015). In addition to allergenic fragrances, there are other chemicals that have been found in e-liquids with a GHS classification for respiratory sensitisers (H334) such as methyl cyclopentalone and α-ionone (Girvalaki et al., 2018).

4. The evaluation of flavours: difficulties

4.1 Should we evaluate flavours or the flavouring chemicals used to create flavours?

E-cigarette consumers choose the flavours they prefer. The number of flavours is particularly large: nearly 20 000 e-liquids with 250 unique flavour descriptions were identified on the Dutch market in 2017 (Havermans et al., 2021), while more than 7000 e-liquid flavours exist (Zhu et al., 2014). In general, e-liquid flavours can be divided into 13 main categories and 90 subcategories (Krüsemann et al., 2019) (Figure 1). Therefore, national legislators may want to intervene at this “macro” level. However, the toxicity of a certain flavour is the result of the toxicity of the various chemical flavouring substances in the e-liquid mixture, both individually and cumulatively (where additivity, synergism, or antagonism may occur).

Another disadvantage of regulations on “flavour level” is that the chemical composition of different brands is not necessarily consistent for a particular flavour. Both the mixture of flavouring substances can vary, as well as their respective concentrations. The fact that ingredients present in quantities below 0.1 % can be kept confidential or considered trade secrets (following Commission Implementing Decision (EU) 2015/2183) makes their characterisation and risk assessment increasingly complex. Substances with such low concentrations can still pose risks, depending on their toxicological profile, exposure type, and potential reactions after heating. Furthermore, when herbal extracts are used, their composition is by definition uneven and variable over time.

The chemical analysis of e-cigarette exposure is complex: aerosol analysis uses techniques like headspace static extraction and gas chromatography coupled with mass spectrometry (GC-MS), and liquid analysis uses liquid-liquid extraction techniques and liquid chromatography (LC) systems (Toledo et al., 2025). Using a headspace gas chromatography-mass spectrometry method (HS GC-MS), Barhdadi (2020) identified 807 flavouring substances in 129 liquids purchased on the Belgian market.

It can be deducted from this that the national legislator may act in two phases. On the macro level of the flavours, the decision on whether or not to allow a flavour (e.g. tobacco in the Netherlands) can be based on figures relating to attractiveness, addiction risk, importance for potential smoking cessation and, if applicable, general toxicological assessments. Subsequently, on the micro level of the individual flavouring substances, a positive list of permitted flavourings can be compiled to “create” the permitted flavour. In the Netherlands, the RIVM has outlined a strategy for this purpose (Pennings et al., 2024).

An alternative regulatory approach would be the option for national legislators to prohibit individual substances with a negative list, a mechanism that is particularly effective when new toxicological evidence becomes available. Research initiatives examining the chemical composition of e-liquids and identifying hazardous constituents are of substantial scientific value and may yield important public health benefits. However, the present regulatory framework—whereby the inhalation toxicity of many substances currently on the market has not been adequately characterised— does not align with the principles applied in comparable chemical legislation. By way of comparison, under

the European REACH regulation, manufacturers producing chemical substances in quantities exceeding one tonne per year are required to submit a comprehensive dossier, supported by high-quality scientific evidence, demonstrating that the substance satisfies safety requirements for both human health and the environment under its intended conditions of use, prior to market entry. This logic is definitely not being followed in practice today by e-cigarettes on the market, where uncertainty about the toxicity and safety of the many substances remains high, and increasing scientific evidence points to health risks (see Chapter 3).

4.2 Toxicological evaluations: a time consuming process with multiple potential endpoints and research strategies

The toxicological evaluation of e-liquid flavours and different flavouring chemicals in these flavours is a time consuming process, combining *in vivo*, *in vitro*, and *in silico* data. The results are often not binary and open to interpretation. For example, there are many different *in vitro* tests available for genotoxicity of chemical substances (e.g. Ames, comet, micronucleus), and not every substance reacts positively in each test. Given the significant amount of flavours on the market (>7000), Barhdadi et al. (2021) developed a prioritisation strategy to identify potentially genotoxic flavourings:

1) Identification of the chemical substances present in the e-liquids via GC-MS screening.
2) Prediction of the genotoxic potential of the substances using two complementary (quantitative) structure-activity relationship (or (Q)SAR) *in silico* models;
3) Collection of existing *in vitro* and *in vivo* genotoxicity data from public literature sources (harmonized CLP classification, opinions by EFSA via the OpenFoodTox database and by the Scientific Committee on Consumer Safety, ECHA);
4) *In vitro* genotoxicity testing on a selection of commercially available flavourings.

⇨ Based on all collected information, flavourings of high concern were identified.

The study of Barhdadi et al. (2021) shows that a full evaluation of flavourings is a complex, time consuming process that requires the use multiple techniques and the integration of a lot of scientific data. In addition, besides genotoxicity, there are numerous other health endpoints that can be evaluated, from the cellular level to the highest levels: e.g. cytotoxicity, ROS formation, irritation, pulmonary inflammation, lung function, endocrine disruption, immune responses. For the legislator, the question then arises: which endpoints (apart from CMR properties, which must lead to exclusion in any case) should be used to classify substances for a ban in e-liquids, and how much evidence is needed to justify legislative action? The precautionary principle is essential here, especially if insufficient toxicological data is available to demonstrate safety.

4.3 Hazard, exposure and risk assessment in the context of e-cigarettes

Every chemical substance has its intrinsic hazards. However, the risk formed by a substance is the product of its hazard and the degree of exposure within a given period. To perform a risk assessment, the exposure can be evaluated with existing health-based exposure limit values for inhalation, derived by (inter)national scientific institutes and health authorities. There is a double difficulty in performing risk assessments of e-cigarettes: sufficient knowledge on hazard and exposure is not available for every substance to establish a consolidated limit value, while exposure cannot be simulated unambiguously due to factors such as variation between individuals (different puffing patterns; safety/uncertainty factors are applied for this purpose), devices and e-liquids.

Klager et al. (2017) studied aldehydes in the aerosols of 24 e-cigarette flavours. Exposure was simulated by connecting the e-cigarettes to a pump drawing air for 2 second puffs with 30 second intervals between each puff. For formaldehyde, a known IARC Group 1 carcinogen, the median concentration (626 µg/m³) in the e-cigarette vapour exceeded the American Conference of Governmental Industrial Hygienists (ACGIH) maximum concentration for workers (370 µg/m³). Hence, health risks could not be excluded.

Three years later, Barhdadi (2020) performed a risk assessment for the inhalation of diacetyl.
For local inhalation toxicity, the concentration in the aerosol was estimated to calculate the maximum alveolar concentration to which the respiratory tract is exposed after inhalation. A point of departure (PoD) was determined based on the NOAEC. The risk was calculated by the Margin of Exposure (MoE), which must be higher or equal than the default value 100 (assessment factor 10 for intra-species differences, and another 10 for inter-species extrapolation). The MoE is the ratio between the dose or concentration obtained from animal studies at which no harmful effect was observed (NOAEL/NOAEC, BMDL) and the estimated exposure level for humans (calculated using the exposure scenarios). It was concluded that a risk for local lung toxicity, being lung tissue lesions associated with chronic pulmonary bronchiolitis obliterans, could not be excluded in case of repeated exposure to diacetyl through e-cigarette use. Besides, a similar MoE-based assessment showed no risk for systemic toxicity related to diacetyl vapours.

The Dutch RIVM evaluated the safety of 23 of flavouring chemicals that can be used in e-liquids to make them taste like tobacco (RIVM, 2022; Pennings et al., 2024). For substances where a point of departure (PoD) could be determined, the risk assessment calculated a Margin of Exposure (MoE), with 4 different exposure scenarios. If not sufficient information was available to determine a PoD, the threshold of toxicological concern approach was used (TTC). Chemicals were removed from the list (1) if a substance has CMR toxic properties or properties that did not allow determination of a safe level of exposure; (2) if the calculated MoE for a substance was lower for one or more exposure scenarios than the minimum MoE that was considered; and (3) if the TTC approach resulted in a possible concern for a substance (RIVM, 2022; Pennings et al., 2024). A total of 7 chemicals was excluded, resulting in a ‘positive list’ of 16 substances.

A drawback in the current risk assessment process, is that it generally focuses on one single substance, which ignores the actual combined exposure to different substances at once. Certain chemicals may interact, potentially resulting in antagonistic, additive and synergistic effects. This is particularly relevant for substances with a similar mode of action. Unfortunately, the latter is often insufficiently known for each substance in a mixture. Reliable and reproduceable Cumulative Risk Assessments are therefore highly needed, but are not currently available for e-cigarettes (and many other situations). In addition, the SHC also aware of the issue of low-dose effects (SHC 8915, 2013; SHC 9404, 2019). The significance of this for the diversity of e-liquids and flavourings is currently unknown, but cannot be ruled out *a priori*. Another major drawback is that the risk assessment process does not account for chemical degradation of the e-liquid substances due to heating.

5. Flavour attractiveness and e-cigarette addiction among young persons

The most important motivators for youth to start vaping are curiosity, the desire for social acceptance, a predisposition for taking risks, peer influence and sibling modelling (Petrella et al., 2025). In the most recent Flemish Pupil Survey (VAD-Vlaamse Leerlingenbevraging, 2023-2024[6]),

[6] https://vad.be/content/uploads/2025/10/Syntheserapport-2023-2024_def_GL.pdf (accessed on 21 October 2025).

curiosity was (one of) the reason(s) for starting to use e-cigarettes among 80.9 % of the pupils who have ever vaped. Flavours attract both young persons and adults to use e-cigarettes, but their appeal is especially relevant for young people. They may increase the product appeal, willingness to use e-cigarettes, susceptibility to use and initiation, and may decrease the harm perception on vaping products (Meernik et al., 2019; Petrella et al., 2025; Livingstone-Banks et al., 2025).

With the introduction of “trendy” and “cool” flavours such as popcorn, bubble gum and candyfloss, the tobacco and vape industry is specifically trying to reach young people with its addictive products. According to the systematic review of Meernik et al. (2019), banning non-menthol flavours in e-cigarettes may reduce e-cigarette use among young persons. It was stated that youth prefer non-tobacco-flavoured e-cigarette flavours, especially sweet flavours like fruit and candy, which was also described by Harrell et al. (2016) in Texas. Concerning fruit and candy flavours, Romijnders et al. (2018) concluded that these specific flavours are considered less harmful than other (tobacco) flavours among both youth and adult scenarios.

Among 1 549 young people (13 - 18 years) in the US who ever tried ENDS, Groom et al. (2020) found that flavour is one of the primary reasons for experimentation with ENDS among youth, while fruit flavour is strongly associated with the use of ENDS as the first tobacco product. These authors recommended to stop the sale of all e-cigarette flavours other than tobacco, a similar recommendation was made in a Dutch study by Krüsemann et al. (2021). In the latter study, it was found that that sweet- and minty-flavoured e-liquids are liked equally by young nonsmokers and adult smokers, and more than tobacco flavours.

In a consumption study among vaping youth in Canada, England, New Zealand and the USA, young people who use fruit flavours reported the highest e-liquid consumption, while some evidence exists of higher consumption levels for sweet/drinks/other flavours (Gomes et al., 2025). Also in a recent study on 598 e-cigarettes confiscated from public and private high schools in Australia, it was found that students prefer fruity flavours with high concentrations of nicotine. Worryingly, most of them contained the coolant WS-23, which was potentially added to reduce throat irritation from nicotine and other chemicals (Jenkins et al., 2025).

In a 2023 study by the Belgian Cancer Foundation (*Stichting tegen Kanker*)[7] on vaping among Belgian youth, both 15- to 20-year-olds (n=682), teaching staff (n=258) and parents of 12- to 20-year-old children (n=1097) were surveyed. The results showed that 38 % of 15- to 20-year-olds had used an e-cigarette at least once, and 16 % said they currently used them. Young people also had a different attitude towards e-cigarettes than older people: 33 % of 15- to 20-year-olds who smoke said they had used an e-cigarette at least once, compared to only 4 % of older respondents. For those over 20, vaping was a way to quit smoking for almost 9 out of 10 (88 %). Among young people aged 15 to 20, this was only 1 in 5 (20 %), indicating that vaping is a practice in itself for the youngest generation. Among the 15- to 20-year-olds and vapers, the pleasant taste, together with stress relief and relaxation, are the most important reasons to use e-cigarettes, compared to older people and persons who do not vape. 38 % of the 15- to 20-year-old vapers indicated that they had started vaping out of curiosity about new flavours (compared to 32 % of the respondents), while 26 % indicated that they might stop vaping if their favourite flavour were no longer available. The fact that there are always new flavours to discover is also a significantly more important reason for young people and vapers to use than for older people and those who do not vape. In addition, peer

[7] https://cancer.be/wp-content/uploads/2024/01/stichting_tegen_kanker_-_rapport_jongeren_en_vapen_2023_-_nl_voor_publicatie.pdf (accessed on 21 October 2025).

pressure ("*my friends do it too*") and the feeling that using together creates a bond are also more important in the youngest age category, compared to older vapers. The fact that products are easy to obtain is also more of a reason for 15- to 20-year-olds compared to older people. According to the 2023 survey, fruit flavours are the most popular, but this is even more pronounced among people aged 15 - 20 (Figures 2-3). Berry flavours (59 %), tropical fruit flavours (36 %) and other fruit flavours (38 %; with watermelon being the most popular) are particularly popular among 15 - 20-year-olds. Candy flavours are also preferred by 16 %.

A recent study by "*Kom op tegen Kanker*"[8] in 2024 among 12 - 26 years olds states that curiosity is the main motivator to try smoking (61 %, n=894) or vaping (58 %, n=1294). When thinking back to the first moment of use, "'*It seemed tasty*" scored noticeably higher with e-cigarettes than with traditional tobacco products (35 % versus 16 %). This is not surprising, because while traditional tobacco products only have tobacco flavour, vapes offer an almost endless range of flavours. "*I was curious about the different flavours*" was answered by 36 % of respondents. Just like with smoking, destressing (43 %) and calming down (43 %) are important motivators to continue vaping. The pleasant taste (42 %) and the variety of flavours (28 %) were additional reasons for young people to use e-cigarettes (n=656). One in three also regarded vaping as a moment for themselves (31 %), a habit (27 %), and something that friends also do (28 %).
In 2024, the *Fonds des Affections Respiratoires* (FARES) conducted its second survey[9] on vaping among 293 young people aged 11 to 24. The results show growing popularity: 92 % of the young people surveyed said they were familiar with vaping, which is a clear increase from the 65 % recorded in the first survey in 2022. This growing popularity is also reflected in an increase in use, with 39 % of young people saying they used e-cigarettes in 2024, compared to 24 % in 2022. The main motivations for consumption are varied tastes (75 %), followed by nicotine (10 %) and the feeling of relaxation (9 %). 49.2 % of young people said they used it primarily because of the flavours. As for the most popular flavours, 61 % said they preferred fruity flavours, 10 % candy flavours, 9 % menthol flavours, and 8 % flavours associated with beverages (cola, lemonade, energy drinks, etc.).

Overall, it can be concluded that flavours are an important reason for the appeal of e-cigarettes among adolescents and young people.

[8] https://www.komoptegenkanker.be/sites/default/files/media/2024-07/Rapport%20_%20jongeren_en_vapen_juli_2024.pdf (accessed on 21 October 2025).
[9] https://www.aideauxfumeurs.be/la-puff-une-cigarette-electronique-qui-seduit-toujours-les-jeunes/ (accessed on 21 October 2025).

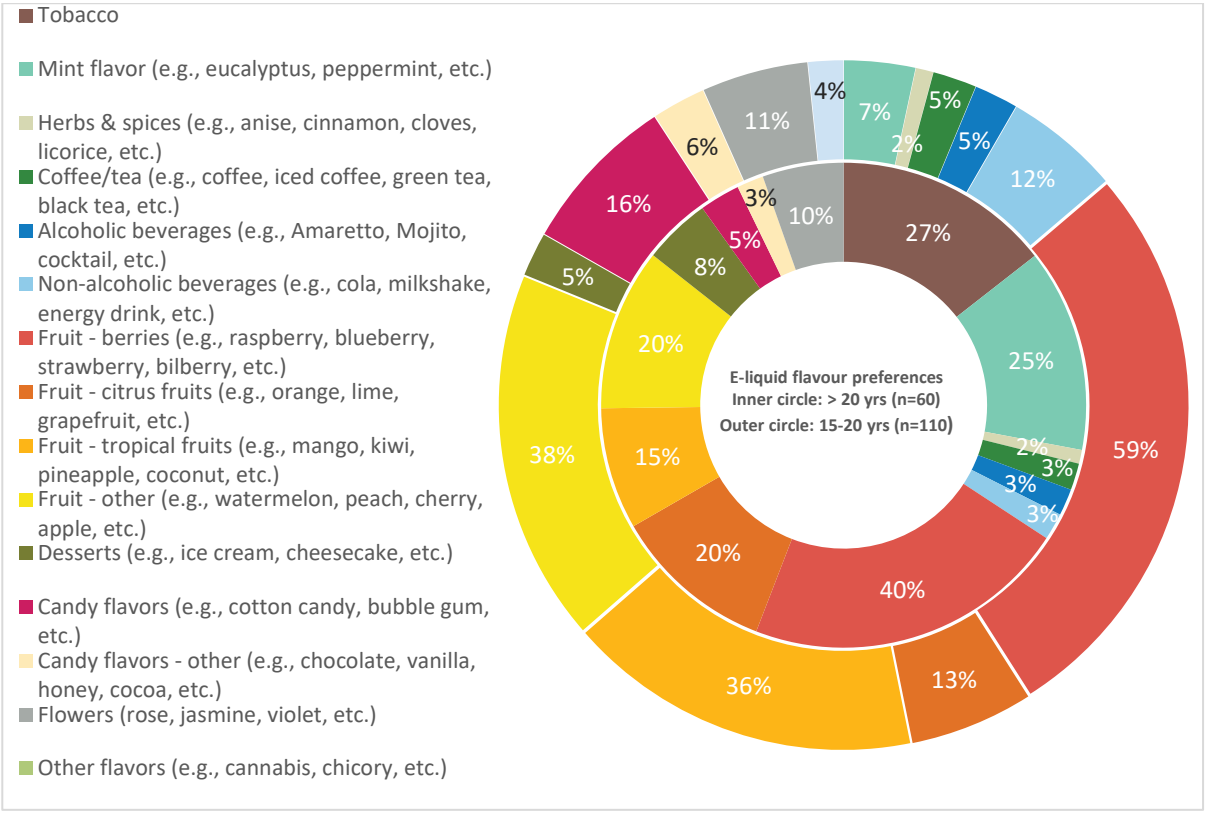

Figure 2. *Preferences for e-liquid flavours among people aged 15–20 (outer circle) and those aged over 20 (inner circle). Based on the question: "Which three flavours do you prefer to use in your e-cigarette?". Source: Stichting tegen Kanker, Indiville survey (2023)*[10]

[10] https://cancer.be/wp-content/uploads/2024/01/stichting_tegen_kanker_-_rapport_jongeren_en_vapen_2023_-_nl_voor_publicatie.pdf (accessed on 21 October 2025).

Figure 3. *Preferences for e-liquid flavours among people aged 15 – 20 (above) and those aged over 20 (below). Based on the question: "Which specific flavours do you use the most in your e-cigarettes?". Source: Stichting tegen Kanker, Indiville survey (2023).*

6. Flavour attractiveness and tobacco smoking cessation

According to the Cochrane Review of Lindson et al. (2025a), high-certainty evidence exists that e-cigarettes with nicotine increase quit rates compared to for example nicotine replacement therapy (NRT). It was found that out of every 100 people using nicotine e-cigarettes to quit smoking, 8 - 10 might successfully stop, compared with 6 of 100 people using NRT, 7 of 100 using non-nicotine e-cigarettes, and 4 of 100 having no support or behavioural support only (Lindson et al., 2025a). In practice, according to the health survey of Sciensano in Belgium (2023 - 2024) [11], 36.0 % of daily Belgian smokers tried to quit smoking in the year before the survey. Of this group, 23.7 % used e-cigarettes, while 58.5 % did not use any aids, and 12.2 % used nicotine replacement therapies (NRT). Only 2.3 % consulted a doctor. It is preferable that the use of e-cigarettes for smoking cessation takes place under the supervision of a health professional. Given the relative success of e-cigarettes as a smoking cessation tool and their growing popularity as a smoking cessation aid among (daily) smokers in Belgium, it is also important to consider the relative importance of flavours to this group of users.

According to the systematic review of Meernik et al. (2019), non-menthol flavours increase appeal, enjoyment and are the main reason many adults want to use e-cigarettes. The evidence on whether non-menthol-flavoured e-cigarettes promote or disrupt cessation among adult smokers remained

[11] https://www.sciensano.be/sites/default/files/ta_report_2023_nl.pdf (accessed on 21 October 2025).

unclear (Meernik et al., 2019). According to the RIVM factsheet (RIVM, 2021), smokers are particularly interested in trying e-cigarettes with a tobacco or menthol/mint flavour. People who have never smoked or vaped before mainly prefer sweet and menthol/mint flavours. Smoking adults find e-liquids with sweet flavours and e-liquids with menthol/mint flavours just as tasty as non-smoking young people (up to 18 years old) and young adults (20 - 15 years old). They also all find these sweet and minty flavours much tastier than tobacco flavours. In the 2023 survey of *Stichting tegen Kanker*, berry flavours are also the most popular (40 %) among vapers aged > 20, followed by tobacco flavour (27 %) and mint/menthol flavours (25 %) (Figures 2 - 3). The biggest difference with the 15 - 20 year olds who were surveyed is the proportion of tobacco and mint flavours among the older group.

It can be noted that the results from the 2023 *Stichting tegen Kanker* survey do not necessarily say anything about the flavours used by people who have successfully quit smoking by using e-cigarettes as temporary smoking cessation tool. Reliable data on this subject appears to be scarce in the scientific literature, and the available behavioural studies are often industry funded. A study by Russell et al. (2019), funded by an e-cigarette company, found that users of non-tobacco flavours were 30 % more likely to report smoking abstinence during the past 30 days compared to users of tobacco flavour. In the largest cross-sectional survey ever performed on patterns of flavoured e-cigarette use among adult vapers in the US (n=69,233), fruit and dessert/pastry/bakery flavours were considered particularly important among those who formerly smoked in their effort to quit smoking and to prevent relapse to smoking (Farsalinos et al., 2023). Tobacco flavours were only used by a minority of the study participants. Unfortunately, also in this study, some authors declared competing interests, including industry funding for behavioural research during the past three years. As a result, the evidence remains unreliable.

A systematic review by Lindson et al. (2023) concluded that there does not appear to be a clear association between e-cigarette flavours and smoking cessation or longer-term e-cigarette use, possibly due to a paucity of data. However, evidence exists that people using e-sigarettes to quit smoking switch between e-cigarette flavours. Similar findings were reported in the systematic review of Liber et al. (2023). These authors state that the evidence about the role of different flavored ENDS use and smoking cessation outcomes is inconclusive, reflecting highly heterogeneous study definitions and methodological limitations (Liber et al., 2023). The review by Lindson et al. (2023) was updated in 2024: Lindson et al. (2025b) concluded that smokers using e-cigarettes to quit smoking generally prefer sweet flavours, but preferences depend on the context. Based on intervention studies, no clear association was found between the use of e-cigarette flavours and smoking cessation or longer-term use of e-cigarettes (Lindson et al., 2025b). In an overview of systematic reviews, Livingstone-Banks et al. (2025) concluded that the impacts of e-cigarette flavours on e-cigarette and cigarette use are inconclusive.

7. The Dutch model

7.1 Outline

Based on scientific research into e-cigarettes and the factors that contribute to their appeal, the Dutch government has concluded that regulating e-cigarette flavours could reduce the appeal of e-cigarettes to young people. Therefore, the Netherlands banned selling e-liquids or vapes with flavours other than tobacco flavour on 1 January 2024. One year later, the packaging of vapes or e-liquids may no longer contain any reference to flavour, including the word “tobacco”.

In order to implement the flavour ban, a positive “limitative” list was created with flavouring substances necessary to compose e-liquids with tobacco flavour. The methodology followed by the RIVM to create this positive list is outlined by Pennings et al. (2024). E-liquid ingredient data was extracted from the European Common Entry Gate (EU-CEG) System, a database in which manufacturers/importers need to provide information about the composition and properties of tobacco and related products marketed in the EU. Only the set of flavourings used in tobacco flavours was selected (n=503). A restrictive list was compiled based on five selection criteria:

1) The flavouring must be prevalent in more than 0.5 % of all tobacco-flavoured e-liquids.
2) The flavouring must be used more frequently (higher %) in e-liquids with tobacco flavour compared with all e-liquids.
3) Flavourings that are mixtures defined as a distillation or extraction product from plant material are excluded, given the inconsistent composition of such mixtures, rendering monitoring difficult.
4) Flavourings associated with tobacco flavour were selected.
    - A. Flavourings with a flavour description containing the word ‘tobacco’ or related terms like “roll-your-own” were added to the proposed list, based on the descriptions in the Leffingwell database.
    - B. Flavourings (not added in A.) with a flavour description with one of the following words were excluded: “sweet”, “honey”, “vanilla”, “caramel”, “chocolate”, “fruit(y)”, “butter(y)”, “popcorn”. Also derived words or fruit types were excluded.
    - C. For the flavourings not added in A. or excluded in B., it was determined if their flavour is part of tobacco aroma or whether they are present in tobacco or smoke. All remaining flavourings were excluded.
5) Health Risk Assessment. Flavourings with health hazards known from public databases (IARC, ECHA, US EPA, JECFA) were excluded.
    - A. Exposure: four exposure scenarios were defined from low to high exposure, for the median and maximum concentrations found for the 23 selected flavourings. For a person of 70 kg, the systemic dose was calculated, assuming that 70 % of the inhaled dose reaches the alveoli, and is totally absorbed there.
    - B. Hazard: substances with CMR properties were excluded. For non-CMR substances, dose-response information was collected (preferentially from inhalation studies) to determine a PoD, after which a MoE was derived. For substances with insufficient information to determine a PoD, the threshold of toxicological concern (TTC) approach was used.
    - C. Risk Assessment: Exposure was compared with hazard.

This finally resulted in a restrictive list of 16 substances (Pennings et al., 2024; Table 1).

Table 1. *The Dutch positive list of allowed flavourings for tobacco-flavoured e-liquids, compiled by the RIVM (Pennings et al., 2024: table 2).*

CAS No	Flavouring name	Flavour description	Association with tobacco
35044-68-9	beta-Damascone	Complex odour of blackcurrant, plum, rose, honey and **tobacco**	Tobacco-like flavour
23726-91-2	(E)-beta-Damascone	Complex odour of blackcurrant, plum, rose, honey and **tobacco**	Tobacco-like flavour
23726-92-3	(Z)-beta-Damascone	Complex odour of blackcurrant, plum, rose, honey and **tobacco**	Tobacco-like flavour
23696-85-7	Damascenone	Fruity floral with apple-plum-raisin-prune, tea, rose, **tobacco notes**	Tobacco-like flavour
23726-93-4	(E)-beta-Damascenone	Fruity floral with apple-plum-raisin-prune, tea, rose, **tobacco notes**	Tobacco-like flavour
1125-21-9	Ketoisophorone	**Tobacco-like**, hay straw, tea notes, honey	Tobacco-like flavour
4883-60-7	2-Hydroxy-3,5,5-trimethyl-2-cyclohexenone	Sweet, musty tea, caramellic odour; musty, tea, nutty, **tobacco taste**	Tobacco-like flavour
536-78-7	3-Ethylpyridine	Strong **tobacco**, roasted, nutty, smoky notes odour; **tobacco-like flavour**	Tobacco-like flavour
350-03-8	3-Acetylpyridine	Strong, burnt roasted, nutty, **cigar tobacco-like**	Tobacco-like flavour
91-10-1	2,6-Dimethoxyphenol	Phenolic-**woody**-medicinal, smoky odour; a tarry, spicy, **smoky** (bacon) taste	Attribute of tobacco aroma
67-47-0	5-(Hydroxymethyl)-2-furfural	Herbaceous winey hay-like odour, sweet herbaceous hay and **tobacco-like** taste	Tobacco-like flavour
591-12-8	alpha-Angelica lactone	Sweet, bread, molasses, coumarin, **tobacco odour**; nut-like taste	Tobacco-like flavour
503-74-2	Isovaleric acid	Very sour, 'sweaty', **cheesy**, odour; fruity on dilution	Attribute of tobacco aroma
1139-30-6	(–)-Caryophyllene oxide	Dry, woody, faint cedar, **tobacco-like notes**	Tobacco-like flavour
3738-00-9	Ambroxide	Intense velvety ambergris notes	Present in tobacco smoke
564-20-5	(3aR)-(+)-Sclareolide	Cedary; **impact compound of certain tobaccos**; fish and berry flavour improver	Tobacco-like flavour

Terms associated with tobacco or tobacco smoke are indicated in bold.

7.2 Effects and perspectives

In a first press communication on the effects of the flavour ban (19/03/2025), a survey by the Dutch RIVM[12] among ca. 500 adolescents and young adults and 450 adults about their e-cigarette use showed 40 % of the respondents reduced their e-cigarette use, while 22 % indicated that they had completely stopped vaping. Daily use of vapes in these groups dropped from 29 to 18 %. Weekly use dropped from 30 to 14 % and monthly use from 42 to 16 %. The unintended side effects of the flavour ban were also investigated by the RIVM: purchase of flavours through the illegal market or people switching to other harmful products. Most consumers who quit because of the ban did not switch to a substitute.

More scientific details on this survey were provided in by the researchers from the RIVM and Wageningen University in an abstract for the World Conference on Tobacco Control 2025 (Hellmich et al., 2025)[13]. Nine months (September 2024) after the implementation of the Dutch flavour ban, a retrospective cross-sectional survey was performed among 548 adolescents and young adults (aged 13 - 24 years) and 457 adults (aged > 25 years), all of whom used e-cigarettes at least monthly before the flavour ban. The following results were reported (quotation):

> *"As a result of the ban, 39.5 % ± 1.7 % of respondents reported reduced vaping, and 22.4 % ± 1.4 % reported quitting. These outcomes did not differ between the two age groups (p = 0.48 and p = 0.06, respectively). The use of flavorless e-cigarettes among younger users increased (from 1.9 % to 3.7 %, p = 0.01), but there was no shift to tobacco flavors. The use of now-banned flavors declined from 91.4 % ± 0.9 % before the ban to 47.0 % ± 1.6 % after (p <0.01). Among those continuing to use banned flavors, the majority (35.6 % ± 2.2 %) purchased them abroad. The use of related products (e.g., nicotine pouches/snus) remained stable pre to post-ban, while the use of other products (e.g., cigarettes) decreased, suggesting no major substitution of e-cigarettes with alternative products."* (Hellmich et al., 2025).

[12] https://www.rivm.nl/en/news/two-in-five-reduced-use-of-e-cigarettes-after-introduction-of-flavour-ban (accessed on 21 October 2025).
[13] https://www.tobaccoinduceddiseases.org/A-comprehensive-evaluation-of-an-e-cigarette-flavor-ban-on-consumer-behavior-and,206322,0,2.html (accessed on 21 October 2025).

Based on these data, the authors concluded that the Dutch flavour ban effectively reduced the e-cigarette use, potentially benefiting public health. However, they recommended that similar bans should be adopted on the international level, to attain maximum effectiveness (Hellmich et al., 2025).

Enforcement remains essential to uphold this ban. Since the introduction of the flavour ban on 1 January 2024, the Dutch Food and Consumer Product Safety Authority (NVWA) has removed millions of sweet-flavoured products from the Dutch market, including 1.7 million vapes with a market value of 12 million euros[14]. In January 2025, the NVWA seized nearly 66 000 illegal vapes and e-liquids, found at seven locations in Amsterdam, Rotterdam, Almere, and Eindhoven. The sellers were fined, and have to pay the costs of destroying the vapes and other prohibited products[15]. According to Van Mourik et al. (2025), NVWA inspections at importers blocked 3.5 million flavoured products and led to the recall of 800 000 more in 2024. Over 1 200 inspections were conducted, in 17 % of the cases a violation of the favour ban was found. These authors concluded that stronger and consistent legislation is needed at the European level, to close gaps in enforcement and prevent cross-border trade in flavoured products.

8. Effects of flavour restrictions in US states

Flavour restriction policies have different and mixed outcomes, which are also affected by other accompanying measures. While the preliminary results of the Dutch flavour ban show favourable trends (after nine months, 29.5 % reduced vaping, 22.4 % reported quitting) without indications of substitution towards cigarettes (Hellmich et al., 2025), other observations were described from the US, where a mixed picture is seen, sometimes with undesirable substitution:

- Tam et al. (2023): An online, national survey of young adults aged 18 - 34 in the US was conducted in 2021 (n = 1523). Mixed responses to e-cigarette flavour bans were registered. Most young adults would continue vaping following flavour restrictions (80.9 %), while 7.8 % of those who exclusively vaped responded to switch completely to combustible tobacco, highlighting a potential negative implication of flavour restrictions.
- Friedman et al. (2024a): In the US, balanced panel analyses of 242 154 individuals (18 - 29 years) consistently found that results in states with flavour restrictions were associated with statistically significant reductions in daily vaping (-3.6 %, 95 % CI: -5.0 to -2.1), but increases in daily cigarette smoking (+2.2 %, 95 % 1.0 to 3.4), compared to changes in states without these restrictions.
- Friedman et al. (2024b): By matching new flavour policy data in 7 US states to retail sales data, these authors concluded that any public health benefits of reducing ENDS sales via flavour restrictions may be offset by public health costs from the increased sales of cigarettes.
- Cheng et al. (2025): Flavour restrictions in 7 US states were associated with reduced e-cigarette use, but also with unintended increases in traditional cigarette use.
- Buckell et al. (2025): US state cigarette and e-cigarette flavour bans were associated with reduced vaping among those who dual use. In Massachusetts, a higher proportion of quitting all tobacco products was observed, because smokers in this state could not substitute with flavoured e-cigarettes which had been banned.

[14] https://www.nvwa.nl/nieuws-en-media/nieuws/2024/04/23/nvwa-weert-miljoenen-vapes-met-smaakjes-van-nederlandse-markt (accessed on 21 October 2025).
[15] https://www.nvwa.nl/nieuws-en-media/nieuws/2025/02/04/nvwa-neemt-in-maand-tijd-tienduizenden-vapes-in-beslag (accessed on 21 October 2025).

- Cotti et al. (2025): Using data from a variety of US surveys (Youth Risk Behavior Surveys, Behavioral Risk Factor Surveillance Survey, and Population Assessment of Tobacco and Health), robust evidence was found that the adoption of an ENDS flavour restriction reduced short-term frequent and everyday ENDS use among youths by ca. 2 - 3 %. However, substitution from flavoured ENDS to unflavoured ENDS and traditional cigarettes was observed among adolescents and young adults. For adults aged 31-and-older, little support exists for the hypothesis that ENDS flavour restrictions increase cigarette smoking.
- Saffer et al. (2025): Based on four national US data sets, evidence was found that young adults (18 - 24 year olds) decreased e-cigarette use by about 2.5 % after the flavour bans, while increasing cigarette participation by 3.5 % (probably an even swap, based on the standard errors of these estimates). For youth, the evidence is less clear. No effect on e-cigarette and smoking participation was found in people aged > 25.

9. Position of the Belgian Superior Health Council

9.1 Earlier position (SHC 9543, 2022)

In the Advisory report SHC (9543, 2022: p. 31-35), a first evaluation was made of possible policy measures to tackle the flavour issue:

> *"- Geen wijziging aan de huidige regelgeving. Dit voorstel werd door de experten niet aanvaardbaar bevonden.*
>
> *- Totaal of drastisch verbod op aroma's in e-vloeistoffen. Sommige parlementsleden hebben wetsvoorstellen ingediend waarin wordt gepleit voor een totaal verbod op aroma's of voor een drastische vermindering van het aantal aroma's. Zo'n totaal of drastisch verbod is volgens de experten niet de oplossing. Deze optie dreigt niet verenigbaar te zijn met de noden van de gebruikers en zou daarom bij hen kunnen leiden tot frustratie; het risico bestaat dan dat zij stoppen met de e-sigaret en weer klassiek gaan roken. Men mag ook niet uit het oog verliezen dat er een aanzienlijke markt is voor aroma's (meer bepaald toegelaten aroma's voor voedingswaren), die men kan kopen en aan e-vloeistoffen toevoegen.*
>
> *- Verbod op kenmerkende aroma's zoals dit in de richtlijn wordt voorgesteld voor tabaksproducten. Dit concept is evenwel moeilijk toe te passen op e-sigaretten: hoe bepaalt men of een product een kenmerkend aroma bevat, welk product moet worden toegestaan of verboden? Sommige landen (Hongarije, Finland; Nederland overweegt het) hebben het geprobeerd, maar stuitten op diverse problemen. Deze optie blijft dus niet overeind, deels omdat zij geen controle van de markt mogelijk maakt en in de praktijk de keuze van de ingrediënten overlaat aan de producenten in de landen die deze optie hebben toegepast.*
>
> *- Opstellen van een negatieve lijst van additieven die verboden zijn omdat ze toxicologisch gezien een onaanvaardbaar risico inhouden versus het opstellen van een positieve lijst van additieven die toegestaan zijn omdat ze toxicologisch gezien een aanvaardbaar risico inhouden.*
>
> *Zoals in het hoofdstuk V over aroma's wordt vermeld, is het onderzoek naar de toxiciteit ervan momenteel beperkt tot bepaalde aroma's. Studies naar de interacties tussen verschillende smaakstoffen en de vorming van toxische verhittingsproducten zijn schaars.*
>
> *Een negatieve lijst zou dan ook beperkt blijven tot producten waarvan men over gegevens beschikt, maar zou geen enkele garantie bieden wat het aanvaardbare risico van e-sigaretmengsels op de markt betreft.*

De experten zijn van mening dat een (beperkte) positieve lijst van onschadelijke stoffen moet opgesteld worden waarvan de aanwezigheid als additieven toegelaten kan worden in e-sigaretten, dit in de plaats van de meer dan 1 800 stoffen die op dit ogenblik toegelaten zijn. De toxicologische eigenschappen van de overgrote meerderheid van deze stoffen is onvoldoende gekend. Het gaat vooral om smaakstoffen of aroma's. Enkel deze additieven mogen toegelaten worden waarvan redelijkerwijze vaststaat dat ze onschadelijk zijn voor de gezondheid. Hierbij kan in de eerste plaats gekeken worden naar een beperkt aantal toxicologische eindpunten zoals genotoxische, hormoonverstorende of kankerverwekkende werking. Echter willen de experten benadrukken dat een correcte positieve lijst enkel kan opgesteld worden op basis van een volledige risicobeoordeling op wetenschappelijke basis. Verschillende noodzakelijke gegevens zijn hier echter niet beschikbaar zoals blootstellingsgegevens (intensiteit van het vapen, gehalte aan additieven, enz.) en toxicologische referentiewaarden. Bovendien moeten om het toxicologisch aanvaardbare risiconiveau te evalueren de toelaatbare doseringen/concentraties en eventueel de mogelijke wisselwerkingen tussen ingrediënten worden bepaald.

…

Het samenstellen van een dergelijke lijst zou evenwel, net als een klassieke positieve of negatieve lijst, de consument de indruk kunnen geven dat de gezondheidsautoriteiten verzekeren dat de verschillende additieven op de markt risicoloos zijn en dat dit ook geldt voor de consumptie van e-sigaretten. Dat zal uiteraard niet het geval zijn en daarom zal bijzondere aandacht moeten gaan naar de overheidscommunicatie daaromtrent."

It should be noted that the SHC's 2022 recommendation for a limited positive list is therefore very similar to the Dutch approach by the RIVM (Pennings et al., 2024), that has since been implemented.

9.2 Objective and possible negative impact of measures

The Belgian legislator must therefore carefully consider the desired and undesired effects in order to be able to anticipate the latter with accompanying measures. With measures restricting the use of flavourings in e-cigarettes, the following favourable outcomes are aimed:

- Objective 1: Reduce the overall (sensory) appeal of e-cigarettes.
- Objective 2 : Protect young people from the design and appeal of e-cigarettes targeted at this age group.
- Objective 3: Reduce the number of non-smoking persons who start vaping.
- Objective 4: Reduce the number of (long-term) dual users.

On the other hand, negative side effects may emerge, and should be taken into account when developing new policies:

- Negative side effect 1: Decreasing the appeal of vaping as a possible smoking cessation aid, causing smoking persons to return to traditional tobacco products.
- Negative side effect 2: The increase in illegal sales on the black market and the internet.

- Negative side effect 3: The purchase of prohibited flavours abroad where they are still permitted.

- Negative side effect 4: People may add inappropriate flavourings to e-liquids themselves, with potentially serious (acute) toxic effects.

9.3 Physical-Chemical Environmental Hygiene and the precautionary principle

While acknowledging that chemistry and technical progress have greatly improved life expectancy and living conditions, the Superior Health Council expressed serious concerns in its advisory report SHC (9402; 2019) about the ever-increasing complex exposure of people to chemicals throughout their lives, and the emergence of civilisation diseases. Real life exposures do not occur to single agents but instead involve complex mixtures of many chemicals and other hazards, with possible interactions between them explaining adverse effects. Sufficient mechanistic insights and molecular-epidemiological data are available indicating that a series of chemical substances contribute importantly to many diseases of civilisation, even if definite epidemiological proof is not yet available. Mutagenic agents, endocrine disruptors, substances binding to hormone receptors, and substances binding to nuclear receptors functioning as transcription factors (which thus can affect gene expression and/or have epigenetic effects) are important, especially with relation to cancer, and contribute also to the risk of other diseases of civilization. Exposures early in life can interfere with an optimal development and can result in disease later in life. An important aspect of the problem is the huge number of chemical substances, among which probably a few percent have mutagenic, carcinogenic, endocrine disrupting or receptor binding properties. Assessing the toxicological properties for humans of a chemical is time consuming and costly, only a very small minority of the chemicals have been adequately studied so far. Therefore a holistic approach involving avoidance or reduction of exposure to many different agents is desirable along the precautionary principle. Hence, the SHC proposed a particular form of hygiene, “physical chemical environmental hygiene” (SHC, 9404; 2019 and Bourguignon et al., 2018). This strategy should act at both the regulatory level (restricting exposure and authorisation of substances if their safety cannot be sufficiently demonstrated, and extending the ALARA principle: exposures should not only be as low as possible, but also as late in life as possible, as short as possible and as few as possible) and at the individual level (international scientific panels should developing preventive measures for target groups, especially pregnant women and children, followed up with human biomonitoring and longitudinal evaluation of health endpoints in the offspring).

The matter of e-cigarette flavourings exemplifies this concern. Individuals may be variably exposed to a myriad of flavourings, many of which have undergone toxicological evaluation solely for oral ingestion rather than inhalation, with substantial uncertainties regarding long-term health effects, potential chemical interactions, low-dose and mixture effects. This unsafe and uncertain exposure is unacceptable to the SHC and justifies an urgent restriction based on the precautionary principle. The pronounced, specific appeal of the extensive range of flavours to young people further augments the urgency of intervention (see Belgian survey data by *Stichting tegen Kanker, Kom op tegen Kanker, Fonds des Affections Respiratoires* between 2023 and 2024; Meernik et al., 2019; Petrella et al., 2025). The growing prevalence of vaping among young people is alarming. According to the most recent Flemish Pupil Survey (*VAD-Vlaamse Leerlingenbevraging*, 2023 - 2024[16]) among 7 522 pupils between 12 - 18 years, 29 % have ever used e-cigarettes, 24 % have

[16] https://vad.be/content/uploads/2025/10/Syntheserapport-2023-2024_def_GL.pdf (accessed on 21 October 2025).

done so in the past year, and 9 % have done so at least once a week. The proportion of regular users is now more than four times higher than in 2018-2019.

9.4 Recommendation: a drastic restriction of flavours

Considering all scientific arguments, including:

- the increasing prevalence of vaping among young people, who are particularly vulnerable to chemical exposure.
- the specific appeal of the many flavours to young people, including flavours specifically targeted at young people (e.g. chewing gum, popcorn, etc.).
- the uncertainty surrounding the toxicological profile and health effects of thousands of flavourings in complex mixtures.
- the growing evidence of adverse health effects due to flavoured e-cigarettes, observed in both *in vitro*, *in vivo* and epidemiological studies (Short-term: increased risk of, among others, irritation of the throat, eyes, and respiratory tract; respiratory symptoms including coughing and conditions resembling pneumonia; asthma attacks and exacerbation of existing asthma; certain cardiovascular effects. Long-term: damage to the respiratory tract, increased risk of serious pulmonary diseases such as COPD; genotoxicity that may contribute to the development of cancers; adverse effects on foetal development and birth outcomes; and other still unknown effects. See SHC 9827, 2025; SHC 9549, 2022; Allbright et al., 2024 and Petrella et al., 2025).
- favourable preliminary results (after nine months) of the Dutch flavour ban, showing a reduction of vaping among 29.5 % of the respondents, and quitting among 22.4 %, without clear indications of substitution towards cigarettes (Hellmich et al., 2025).
- the principles of physical-chemical environmental hygiene (see SHC 9404, 2019).

The Superior Health Council unanimously recommends an urgent and drastic reduction in the number of flavours available for e-cigarettes. There are two positions within the Council:

1) **From a toxicological and precautionary perspective, part of the working group prefers a flavour ban based on the Dutch model, whereby only tobacco flavour is permitted.** This tobacco flavour may only be composed on the basis of a positive list of 16 flavourings, for which there is currently insufficient information to demonstrate harmful effects (Pennings et al., 2024).

   Several studies recommend such a ban ban (e.g. Groom et al., 2020; Krüsemann et al., 2021). An advantage of this approach is uniformity with the Netherlands, and possibly other European Member States in the future, which facilitates enforcement (see Van Mourik et al., 2025). If this option is opted for, the positive list must be regularly re-evaluated when new toxicological and other data become available.

2) **From a smoking cessation perspective, another part of the working group prefers to allow a few additional flavours besides tobacco flavour (generally ≤ 3).** They propose this option out of concern that e-cigarettes could lose their attractiveness as a potential tool to help certain smokers quit (Lindson et al., 2025a), and to prevent any return of some vapers to regular cigarettes, as seen in some US states after flavour restrictions (Tam et al., 2023; Friedman et al., 2024a, 2024b; Cheng et al., 2025; Cotti et al., 2025, Saffer et al.,

2025). However, the current evidence is inconclusive and shows no clear association between the use of e-cigarette flavours and smoking cessation outcomes or longer-term use of e-cigarettes, although few studies are available (Liber et al., 2023; Lindson et al., 2023, 2025b; Livingstone-Banks et al., 2025).

If additional flavours are to be permitted, they should be selected based on a survey of (Belgian) ex-smokers who successfully quit smoking using e-cigarettes and subsequently ceased vaping. The selected flavours should be as unappealing as possible to young people. As such a study is currently unavailable, it would need to be conducted prior to selection. After flavour selection, a positive list of flavouring substances for flavour formulation should be established using a methodology comparable to that employed by the RIVM for tobacco flavour (Pennings et al., 2024).

For some flavours, it is already clear that they are not eligible. For example, watermelon is the most popular flavour among youths aged between 15 and 20, according to the 2023 survey by *Stichting tegen Kanker*. While not popular among adolescents, mint/menthol flavour cannot be allowed anymore under Article 7.6d of Directive 2014/40/EU and Article 4, § 4, 5° of the Royal Decree of 28/10/2016 (prohibiting additives that facilitate the inhalation or absorption of nicotine). The anti-irritant effect of the flavouring menthol can lead to longer inhalation of aerosols, which can increase the retention of cytotoxic substances (Petrella et al., 2025). A recent randomised crossover clinical trial showed that menthol-flavoured e-cigarettes enhanced e-cigarette use experience compared with tobacco flavour (Chowdhury et al., 2025). This study suggests that menthol in e-cigarettes poses a risk to nicotine-naïve youth to initiate e-cigarette use and keep those young people currently using, addicted (Chowdhury et al., 2025). In a study by Leigh et al. (2016), menthol, coffee and strawberry-flavored aerosol significantly reduced both cell viability and metabolic activity. Besides, multiple studies indicate that creamy flavours and flavours with cinnamaldehyde in particular pose higher risks (McNeill et al., 2022; Royal College of Physicians, 2024). Cinnamon flavourings can impair anti-pathogen immune responses, reduce mucociliary clearance, and enhance oxidative stress (Allbright et al., 2024).

Both positions are scientifically substantiated but are constrained by gaps in the available data. The decision ultimately lies with the policymakers. **However, it is evident that individual adult preferences cannot trump population-level youth protection. The existing body of scientific evidence is sufficiently robust to justify immediate regulatory action.**

To ensure that strict flavour restrictions are effectively implemented, the SHC strongly recommends significantly intensifying enforcement efforts. Drawing on the experience of the *Nederlandse Voedsel- en Warenautoriteit* (NVWA) in the Netherlands (Van Mourik et al., 2025), key challenges include combating illegal trade, proving non-compliant sales, and addressing the sale of flavoured accessories (e.g. aroma balls and mouthpieces). Inspections should target importers and retail points of sale, while online platforms and social media must be closely monitored for illegal sales and advertisements, with identified violations reported and removed (Van Mourik et al., 2025). Besides, age verifications at points of sale should be further controlled by means of mystery shoppers.

Finally, the SHC also advocates diplomacy with neighbouring countries to coordinate policies, to prevent cross-border purchases.

9.5 Other recommendations

- The SHC recommends to amend the existing national and/or European legislation, so that all new nicotine products that are not medically recognised are subject to the existing laws on tobacco products, or completely banned from market introduction. In this way, healthcare policymakers can stay ahead of the tobacco industry in order to prevent 'new' problems in the future where the damage must be limited 'post hoc', as is the case with e-cigarettes.

- The SHC recommends closely monitoring and tracking the effects of a flavour ban or flavour restrictions after implementation, so that the policy can be further refined afterwards. The positive list of permitted flavourings must be evolutionary so that new information can be responded to quickly, in one direction or the other.

- The SHC recommends launching an information campaign for vapers around the start date of flavour restrictions to prevent them from returning to traditional cigarettes, as observed in some US states.

- The SHC agrees to prohibit the presence of synthetic cooling agents (e.g. WS-23) in e-liquids, under Article 7.6d of Directive 2014/40/EU and Article 4, § 4, 5° of the Royal Decree of 28/10/2016 (prohibiting additives that facilitate the inhalation or absorption of nicotine). Their presence may undermine the efficacy of flavour bans (Jenkins et al., 2025, Minetti et al., 2025). These should be explicitly prohibited.

- The SHC recommends to prohibit all flavoured accessories such as aroma balls and mouthpieces, as their use may undermine the efficacy of flavour restrictions.

- The SHC recommends to ban Do-It-Yourself (DIY) e-liquids, as they are even less standardised and may therefore pose serious health risks. In DIY preparation, the vaper creates their own liquid by mixing concentrated flavourings, a nicotine booster, and a PG/VG base.

- The SHC recommends (already in advisory report no. 9549) the inclusion of a maximum period of use after opening on e-liquid bottles, taking into account the stability and durability of e-liquids (for example, the sensitivity of nicotine to light). The purpose is to minimise the formation of degradation products in e-liquids and to ensure that the declared nicotine concentration is maintained.

- The SHC recommends to standardise the packaging of e-cigarettes and e-liquids and to make the packaging as neutral as possible. These measures reduce the appeal to young people (see e.g. Taylor et al., 2025).

- The SHC recommends drastically stepping up the fight against the illegal trade and market in e-cigarettes, also online. This is essential in order to ensure that further measures are also implemented in practice.

- The SHC recommends setting up more prevention campaigns that highlight the dangers of tobacco and vapes, specifically targeting young people. Besides, also parents should be

encouraged to quit smoking and vaping, to set a good example. Smoking and vaping behaviour in young people is strongly linked to their parents' smoking and vaping behaviour.

- The SHC recommends encouraging independent research to determine and quantify the real world, long-term impact of e-cigarettes (both health effects and impact on smoking cessation).

- The SHC recommends that the telephone number of the quitline "*Tabakstop*" should also be mandatory on the packaging of e-cigarettes (080011100).

- The SHC recommends that the word 'nicotine', the accompanying warning message and the nicotine concentration should be stated more clearly and in larger print on the packaging of e-cigarettes and all other products containing nicotine. Besides, in addition to the warning message on the addictive nature of nicotine, another warning on the 'hazardous' or 'toxic' character should be added.

- The SHC recommends that, to protect the environment, policy should also focus on recycling and raising awareness about e-cigarettes and their components in litter.

Some specific recommendations are also made regarding traditional tobacco products:

- The SHC recommends to continue the promotion of other evidence-based smoking cessation aids. These should be made more accessible. It should therefore be investigated whether some of these aids can be reimbursed, either in full or in part, especially for socio-economically vulnerable populations.

- The e-cigarette is a cause for concern for the SHC, but that should not detract from the need to further step up the fight against smoking traditional tobacco products. Approximately 80 to 90 % of lung cancers and associated mortality are attributable to tobacco smoking, and smokers are 20 times more likely to develop lung cancer than non-smokers (Boyle & Maisonneuve, 1995; Cislaghi & Nimis, 1997; IARC, 2004; Jemal et al, 2008; Wood et al, 2018; Surgeon General, 2004; All.Can Belgium, 2024). The risks increase with the length of time (number of years) and amount smoked (number of cigarettes per day) and the younger the age at which smoking starts. The vast majority of lung cancers can therefore be avoided by not starting to smoke, but also by quitting smoking. Smoking cessation initiatives should therefore be further expanded and supported, and the availability and accessibility of conventional tobacco cigarettes should be further restricted.

- The SHC recommends to strongly restrict the points of sales for the classical cigarette and all other non-medical nicotine containing products (including the e-cigarette).

- The SHC recommends continuing to work at European level to ban cigarette filters (SHC 9726, 2023; Everaert et al., 2023).

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V. COMPOSITION DU GROUPE DE TRAVAIL

La composition du Bureau et du Collège ainsi que la liste des experts nommés par arrêté royal se trouvent sur le site Internet du CSS (page : Qui sommes-nous).

Tous les experts ont participé ***à titre personnel*** au groupe de travail. Leurs déclarations générales d'intérêts ainsi que celles des membres du Bureau et du Collège sont consultables sur le site Internet du CSS (page : conflits d'intérêts).

Les experts suivants ont participé à l'élaboration et à l'approbation de l'avis. Le groupe de travail a été présidé par **Filip LARDON** et **Frieda MATTHYS** et le secrétariat scientifique a été assuré par **Stijn EVERAERT**.

BARHDADI Sophia	Pharmacie, cigarettes électroniques, chimie analytique	Sciensano
CATALDO Didier	Pneumologie, biologie moléculaire	ULiège, BeRS
CRUNELLE Cléo	Neuroscience, toxicomanie	VUB, *UZ Brussel*
DECONINCK Eric	Chimie analytique, additifs, contaminants	Sciensano
EGER Katrien	Pneumologie	UZA, BeRS
FRAEYMAN Norbert	Pharmacie, toxicologie	*UGent*
GABRIELS Suzanne	Prévention du tabagisme, sevrage tabagique, psychologie	Fondation contre le Cancer
GODDERIS Lode	Médecine du travail, prévention, toxicologie	*KU Leuven*, IDEWE
GOEMINNE Pieter	Pneumologie	VITAZ, BeRS
HAFID Imane	Médecine générale	SSMG
JANSSENS Annelies	Oncologie thoracique	UZA
LARDON Filip	Oncologie, physiologie médicale	*UAntwerpen*
MATTHYS Frieda	Psychiatrie	VUB
MAES Veerle	Prévention du cancer	*Kom op tegen Kanker*
MEUNIER Adrien	Sevrage tabagique	Hôpital de la Citadelle
MICHEL Olivier	Pneumologie	ULB
POCHET Sophie	Marketing, communication	Haute École Galillee
SCHOETERS Greet	Santé environnementale, toxicologie	*UAntwerpen*
VAN HAL Guido	Prévention du tabagisme, sociologie médicale, dépistage du cancer	*UAntwerpen*
VAN LAREBEKE Nicolas	Cancerogenèse, prévention du cancer	*UGent*, VUB
VERHEYEN Marc	Prévention du tabagisme, formation et développement professionnel	VRGT
WILLAME Elise	Prévention du tabagisme	FARES

L'expert suivant a été entendu mais n'a pas participé à l'approbation de l'avis:

HENDRICKX Stefaan	Prévention du tabagisme, sevrage tabagique, inégalités de santé	*Vlaams Instituut Gezond Leven*

Au sujet du Conseil Supérieur de la Santé (CSS)

Le Conseil Supérieur de la Santé est un organe d'avis fédéral dont le secrétariat est assuré par le Service Fédéral Santé publique, Sécurité de la Chaîne alimentaire et Environnement. Il a été fondé en 1849 et rend des avis scientifiques relatifs à la santé publique aux ministres de la Santé publique et de l'Environnement, à leurs administrations et à quelques agences. Ces avis sont émis sur demande ou d'initiative. Le CSS s'efforce d'indiquer aux décideurs politiques la voie à suivre en matière de santé publique sur base des connaissances scientifiques les plus récentes.

Outre son secrétariat interne composé d'environ 25 collaborateurs, le Conseil fait appel à un large réseau de plus de 500 experts (professeurs d'université, collaborateurs d'institutions scientifiques, acteurs de terrain, etc.), parmi lesquels 300 sont nommés par arrêté royal au titre d'expert du Conseil. Les experts se réunissent au sein de groupes de travail pluridisciplinaires afin d'élaborer les avis.

En tant qu'organe officiel, le Conseil Supérieur de la Santé estime fondamental de garantir la neutralité et l'impartialité des avis scientifiques qu'il délivre. A cette fin, il s'est doté d'une structure, de règles et de procédures permettant de répondre efficacement à ces besoins et ce, à chaque étape du cheminement des avis. Les étapes clé dans cette matière sont l'analyse préalable de la demande, la désignation des experts au sein des groupes de travail, l'application d'un système de gestion des conflits d'intérêts potentiels (reposant sur des déclarations d'intérêt, un examen des conflits possibles, et une Commission de Déontologie) et la validation finale des avis par le Collège (organe décisionnel du CSS, constitué de 30 membres issus du pool des experts nommés). Cet ensemble cohérent doit permettre la délivrance d'avis basés sur l'expertise scientifique la plus pointue disponible et ce, dans la plus grande impartialité possible.

Après validation par le Collège, les avis sont transmis au requérant et au ministre de la Santé publique et sont rendus publics sur le site internet (www.hgr-css.be). Un certain nombre d'entre eux sont en outre communiqués à la presse et aux groupes cibles concernés (professionnels du secteur des soins de santé, universités, monde politique, associations de consommateurs, etc.).

Si vous souhaitez rester informé des activités et publications du CSS, vous pouvez envoyer un mail à l'adresse suivante : info.hgr-css@health.belgium.be.

www.conseilsuperieurdelasante.be

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