PREVENTIVE HEALTH IN TRANSITION: NAVIGATING FUTURE PATHWAYS

WHITE PAPER

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1. Introduction

Preventive health represents a key public responsibility in the Netherlands. A diverse set of actors, such as the Ministry of Health, Welfare and Sport (VWS), the National Institute for

Public Health and the Environment (RIVM), and municipal public health services (GGD's) are mandated to promote and protect population health. These actors have implemented highly diverse measures, ranging from vaccinations and population screenings programs to sanitation policies, occupational health regulations, and urban planning standards (Mierau & Demaria, 2026; Van Meeteren et al, 2022). These interventions have contributed to considerable gains in life expectancy and healthy life expectancy along with important reductions in disease burden and associated societal and economic costs, as well as notable gains in population-level wellbeing (RIVM, 2018; RIVM, 2024).

Preventive health refers to all activities aimed at maintaining and supporting health and wellbeing, preventing and/or delaying health problems and the onset of disease(s), and slowing the progression of disease(s) and diminishing its negative impacts upon all aspects of a person's life. Preventive health is a broad, complex, and at times even contested term.The conceptualisation we provide here is informed by approaches and policy frameworks put forward by Dutch public health institutions and international organisations (VTV, 2024; RIVM, 2024; WHO, 2022). To acknowledge the diversity of perspectives and practices that fall under preventive health, we refrained from adopting a single, prescriptive definition and instead used this term as a broad analytical umbrella.

Yet, the Dutch preventive health system is currently confronted with longstanding and emerging structural pressures and challenges. A growing body of studies on health determinants has emphasised that health is importantly shaped by interactions between biomedical risk factors, such as high blood pressure, and broader social, environmental, commercial, and behavioural factors (Lakerveld et al, 2020; Mierau & Demaria, 2026; Vermeulen et al, 2020; RIVM, 2024). At the same time, there is increasing recognition that health risks are importantly shaped by deepening inequalities in income, education, and living conditions. Recent reports show that in The Netherlands people with a low level of education live on average six years less than those with a high level of education, and experience approximately twenty fewer years in good health (CBS, 2025).

The challenges are intensified by broader socio-economic and environmental shifts, like population ageing, rising prevalence of chronic diseases, climate change and environmental stress, biodiversity loss, urbanisation, and digitalisation (Baccarelli et al, 2023; Dolley, 2018; Meyers, 2017; Rockström et al, 2025). These pressures are further exacerbated by the fragmented organisation and governance of preventive health in The Netherlands, with responsibilities distributed across ministries, public health services, municipalities, insurers, community organisations, that have different mandates, interests, and priorities. This fragmentation makes it difficult to coordinate interventions across sectors, align investments, and address complex determinants of health. These governance challenges are reinforced by limited and unevenly distributed funding. In recent years, preventive health was accountable for only 5% of the total healthcare expenditure in the Netherlands (OECD, 2025), thereby reinforcing a structural imbalance favouring curative care. In sum, the Dutch preventive health system needs to tackle health risks that are both highly complex and unevenly

distributed across population groups while functioning under conditions marked by fragmentation and financial constraints.

The preventive health system can be understood as a socio-technical system. A socio-technical system is a system in which people, technology, processes, and organisational structures interact. In this context, the preventive health system refers to how health promotion, disease prevention, and wellbeing are organised across society. It entails interconnected institutions, technologies, policies, infrastructures, professional practices, markets, and everyday behaviours that together aim to maintain and improve population health by addressing biomedical, social, environmental, and behavioural determinants of health.

The aforementioned challenges make the development and implementation of preventive health interventions both more necessary and more complex. This complexity is reflected in national preventive health targets articulated in recent strategic policy documents[1]. These documents focus on: 1) increasing healthy life expectancy and the social inclusion of people living with chronic diseases and disabilities; 2) reducing socio-economic health inequalities, and effectively addressing behavioural and environmental risk factors, such as smoking, unhealthy diets, physical inactivity; and 3) promoting healthy living environments.

As these policy documents also stress, successfully meeting the national preventive health targets requires integrated governance approaches, alignment and scaling of groundbreaking technological, institutional, and social innovations, and considerable changes in societal values, professional and commercial practices, and everyday behaviours. Such a fundamental and multi-faceted change of the preventive health system means that rather than fragmented and incremental changes, a broader preventive health transition is required. Such a transition would involve coordinated transformation across multiple dimensions of the system and entail changes in the rules, standards, technologies, infrastructures, professional and commercial practices, routines, and social norms shaping preventive health

The **preventive health transition** refers to the long-term, multi-dimensional transformation through which the preventive health system is fundamentally strengthened to promote health and wellbeing and reduce health inequalities, by developing integrated, cross-sectoral approaches that enable the effective management of biological, social, economic, and environmental determinants of health.

To investigate what such a transition entails, a structured three-step analytical approach is required. First, it is necessary to analyse how the current preventive health system operates in practice, in particular by identifying the dominant rules (including routines and assumptions) that structure actor behaviour and coordination across the system.

[1] The Knowledge and Innovation Agenda of Health Holland, the *Nationaal Preventieakkoord* (NPA), and, more recently, *De Samenhangende Preventiestrategie* (NPS).

A **rule** is "[a] humanly devised constraint and enabler that structures human action leading to a regular pattern of practice, present in a single socio-technical system" (Kanger et al, 2024:3)

Determining the rules that shape how preventive health is implemented and governed in the present allows for understanding where path dependencies and lock-ins exist. At the same time, it can also help identify existing tensions and misalignments which may create opportunities for systemic change.

Second, it is important to identify niche innovations, that is, new and emerging technologies, institutional forms, governance or financial arrangements, and practices, which are developed in protected space where they can mature without being immediately exposed to the selection pressure of the current preventive health regime. These innovations seek to answer preventive health needs that are currently unmet or to provide new ways to address existing challenges. Mapping these niche innovations reveals where experimentation and learning are already taking place, which actors and resources are being mobilised, and which combinations of technological, institutional, governance, financial, and social innovations are likely to reinforce each other.

Third, it is necessary to identify elements of a desirable future on preventive health shared across different stakeholders. Such a desirable future then functions as a 'dot on the horison' for different pathways to be developed. These pathways represent different ways in which a desirable future could be realised through coordinated change across the preventive health system's core dimensions. Such a participatory and future-oriented step can help align expectations and support coordinated action across different stakeholder groups (cf. Voß et al, 2009).

The two analytical steps speak to the following two questions this White Paper asks:

1. Which **dominant rules** structure how preventive health is governed and organised in the Netherlands?
2. What **niche innovations** are considered promising for systemic change in preventive health, and what opportunities and challenges (are likely to) shape their development and diffusion?
3. What **transition pathways** could support a systemic shift towards a stronger preventive health system in the Netherlands? More specifically, which institutional, technological, social, and governance changes would be required to realise a desirable future for preventive health in the Netherlands?

In answering these questions, we make a clear analytical distinction between the curative and the preventive health systems. While we are aware that preventive health is increasingly framed as a response to some key challenges facing the current healthcare system, such as population ageing, rising healthcare expenditures, and shortages of healthcare professionals,

this framing risks confusing two distinct but interrelated socio-technical systems with different societal functions. Curative healthcare is primarily oriented towards treating and managing disease, whereas preventive health is oriented towards preventing disease, promoting health, and sustaining wellbeing across the life course. There is no a priori reason to assume that a transition towards preventive health comes at the cost of or as a replacement of the curative healthcare system. In this White Paper, we therefore investigate solely the rules, assumptions, expectations, and future visions that structure the organisation, governance, and development of preventive health and we refrain, to the extent possible, from engaging with practices and approaches focusing on the diagnosis and treatment of diseases.

The exploratory qualitative study presented in this White Paper was initiated in December 2024 by the Institute for Preventive Health (I4PH) in collaboration with researchers from the Copernicus Institute of Sustainable Development (Utrecht University). The I4PH is dedicated to accelerating systemic change in preventive health, with the mission to increase healthy life expectancy by at least five years for all Dutch citizens and to reduce health inequalities between socio-economic groups by 30% by 2040.

In this White Paper, we present the main findings for the three research questions, covering the dominant rules shaping the Dutch preventive health regime, the niche innovations currently emerging around it, four transition pathways whereby the current system could be transformed. We first introduce the main rules that structure activities and interactions between actors within the current regime and briefly discuss the emerging tensions. We then provide an overview of the main types of niche innovations we identified and highlight their transformative potential, as well as the opportunities and challenges affecting their development and diffusion that participants in our study flagged out. We subsequently introduce the four transition pathways: *Making preventive health with all, for all*; *Making preventive health 'the easy choice'*; *Making preventive health planetary-centered*; and *Making preventive health investable*. These pathways were developed by considering the main issues plaguing the current preventive health regime, a shared vision of a desirable future, and by combining technological, institutional, governance, financial, and social innovations that could be reinforce one another, gather support from relevant actors and help bring about the necessary systemic changes. Combining different types of niche innovations was necessary, as the complexity of the preventive health system and the diversity of societal goods it needs to contribute to preclude a transition driven by one type of innovation alone.

These pathways are meant to provide strategic orientations to policy-makers in health and other relevant sectors, as well as experts and practitioners active at different levels, to support the governance of the transition towards a future in which preventive health is more pronounced. By suggesting how different types of niche innovations could be combined, these transition pathways can help align such diverse stakeholders around shared long-term goals. The transition pathways we developed also provide suggestions for balancing innovations with social needs and for reconciling different mandates, interests, and priorities,

thereby supporting the development of solutions that are both feasible and socially acceptable. Moreover, organisations and governments can use these pathways to map out long-term strategies. For example, a transition pathway intended to increase physical activity may combine a digital exercise-tracking app with community-based walking and support groups alongside new policies guaranteeing affordable access to sports facilities and safe spaces for exercise. Together, these interventions would reinforce one another and render healthy behaviours easier to adopt and sustain over time.. Lastly, these transition pathways are not rigid, they should not be understood as future predictions indicating what should happen within a given time interval, or as fixed solutions. Rather, they should be seen as flexible guiding frameworks, that allow for iterative adjustments based on real-world feedback. This adaptability is crucial for addressing emerging challenges, such as new health risks or technological advancements. Accordingly, we recommend approaching them as analytical constructs, which synthesise dominant and emerging expectations about a desirable future preventive health system in the Netherlands. They are intended to serve as basis for dialogue, collective learning, and the development of shared goals.

2. Theoretical Framework

For studying preventive health transitions we draw on the **field of Transition Studies**. Transition studies scholars have shown that socio-technical systems generally change through multiple processes, unfolding at different levels and over long periods of time. A socio-technical system is an interlinked configuration of technologies, material infrastructures, actors, institutions, practices, norms, and values that together fulfil a specific societal function. From this point of view, the preventive health system can be understood as fulfilling the societal function of protecting, preserving, and promoting people's health.

socio-technical system : "tangible and measurable elements (such as artefacts, market shares, infrastructure, regulations, consumption patterns, public opinion)" (Geels, 2011:31).

In contrast, a **socio-technical regime** includes "intangible and underlying deep structures (such as engineering beliefs, heuristics, rules of thumb, routines, standardised ways of doing things, policy paradigms, visions, promises, social expectations and norms" (Geels, 2011:31)

A socio-technical regime refers to "[r]elatively stable and aligned rulesets directing the behaviour of actors along the trajectory of incremental innovation, present in a single socio-technical system" (Kanger et al, 2024:3)

To study how preventive health is currently structured and positioned in the Netherlands we applied the **multi-level perspective** (MLP) framework, which is often used to study large societal transitions, such as the digitalisation of public services, or the shift from fossil fuel-based mobility to electric transport. (Geels, 2024). Drawing on insights from evolutionary economics and the sociology of innovations, the MLP framework distinguishes three interacting and mutually shaping levels*:* landscape, regime, and niche. The **landscape** level refers to broad, long-term developments, such as demographic shifts, economic trends, globalisation, that put external pressure on existing systems but are difficult to influence directly. The **regime** refers to the dominant structures and practices of a system, including its technologies, norms, institutions, networks of actors, that together maintain stability[2]. Important in investigating regimes is the identification and development of **rules** that coordinate activities and stabilise specific ways of organising societal functions. The mapping of rule development in regimes over time is necessary, as transitions occur through the emergence, alignment, contestation and, eventually, diffusion of new rules, which gradually reshape and reorient patterns of activity. Rules that support regimes are covering different domains, such as science and technology, business and industry, policy and governance, users and markets, and culture. Understanding what these rules consist of, how they are distributed across these domains, and how strongly they align with one another is necessary to determine the strength, coherence, and stability of a regime. In contrast, weak alignment or important contradictions between the rule sets identified in different domains can point to sites of tension, contestation, or emerging change, which can be used as potential leverage points for a transition.

The third level of the MLP covers **niches**, which are protected spaces, where new ideas, innovations, or experiments, often with a radical, groundbreaking character, can develop. These niche innovations are shaped by the interactions of diverse actors, and may over time challenge existing routines and institutional arrangements through processes of learning, alignment and upscaling. In so doing, these niche innovations can penetrate and transform through a socio-technical regime, thereby also influencing broad landscape dynamics.

To illustrate the way in which the MLP framework can be applied for preventive health, we drew the following, highly stylised transition pathway (see Figure 1). To elaborate on the example, the four phases are explicated below the figure.

[2] According to Geels (2011:3), systems denote “tangible and measurable elements (such as artefacts, market shares, infrastructure, regulations, consumption patterns, public opinion), whereas regimes refer to intangible and underlying deep structures (such as engineering beliefs, heuristics, rules of thumb, routines, standardised ways of doing things, policy paradigms, visions, promises, social expectations and norms”.

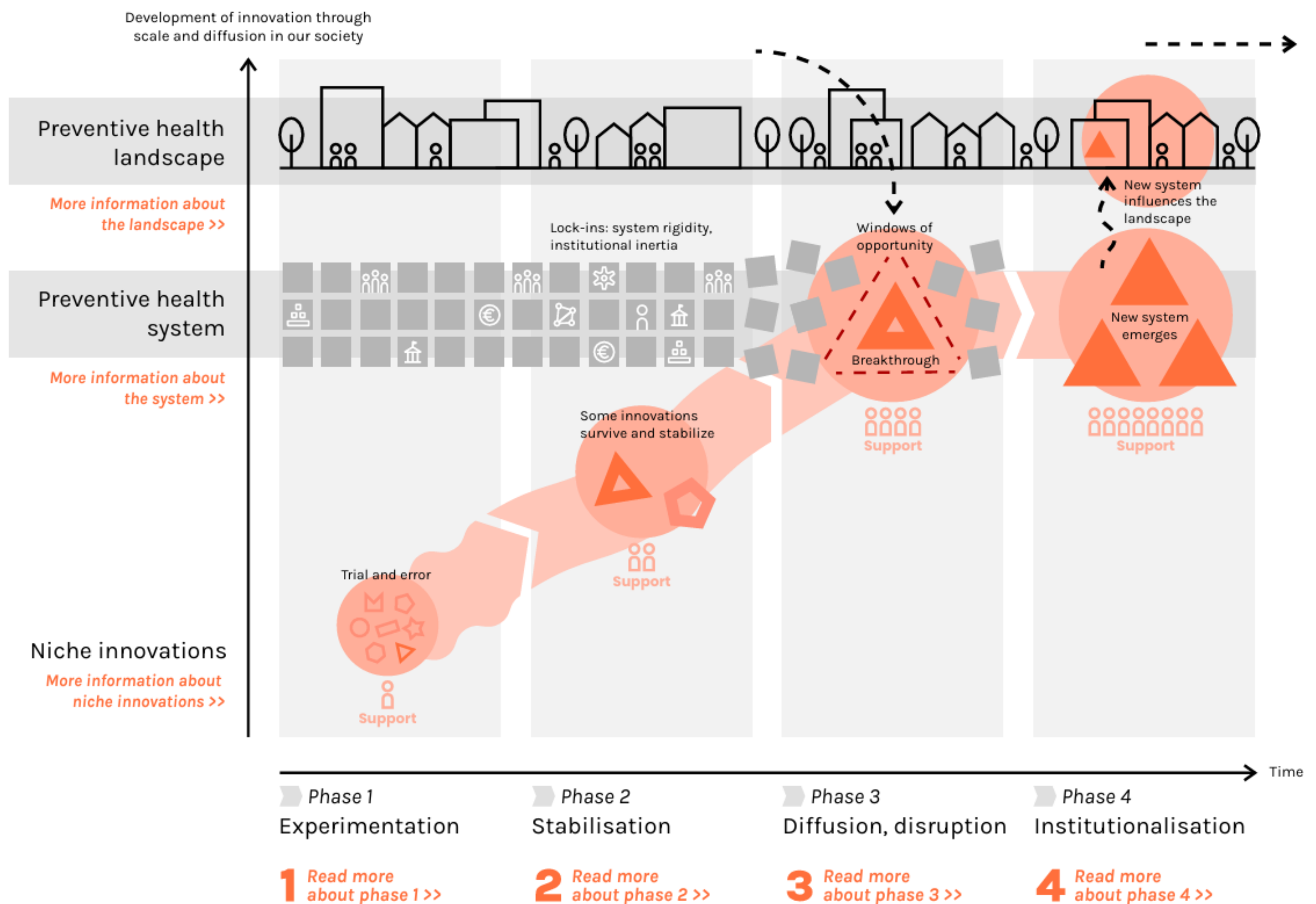

Figure 1: Stylised example of how the Multi-level perspective can be applied to preventive health.

Phase 1. Groundbreaking innovations emerge in small niches through activities of outsiders to the current socio-technical regimes, i.e. entrepreneurs, activists, start-ups, who aim to satisfy unmet needs or offer radically new, groundbreaking ways to satisfy needs. In this phase, groundbreaking innovations tend to be rather 'clunky' in this phase, costly, difficult to use, not performing so well or requiring specialised knowledge to be used. Niches form a 'protected space' where necessary alliances of actors take shape, and where necessary learning and diffusion of knowledge is facilitated. Only a few groundbreaking innovations 'survive' to the next phase. For example, the early versions of textured vegetable protein (TVP) were bland and used as low-cost meat extenders. Initial commercialisation in processed meals and drinks in schools and canteens created a sheltered environment where learning and incremental product improvement could unfold, contributing to diffusion of a wide variety of options.

Phase 2. Groundbreaking innovations manage to penetrate one or a few market niches and their design stabilises into a dominant format. Design guidelines and specifications emerge,

and a certain amount of necessary resources for the development and distribution of the innovation has been secured. Groundbreaking innovations face uphill struggles to penetrate the socio-technical regime due to various lock-ins that favour incremental innovations, which continue to be developed. Lock-ins can be among other: political (lobbying activities by influential actors to maintain status quo); regulation favouring incumbents (established, influential actors); technical and economic incentives (low costs for incremental innovations, high performance due to considerable knowledge and experience available); social and cultural characteristics (habits and routines); user practices, lifestyles, and identities expressed through behaviours organised around particular technologies/norms and values; and, powerful networks of established actors. Groundbreaking innovation continues to be more expensive than already available alternatives, and there is still uncertainty about its users' needs, requirements, preferences.

Phase 3. The widespread distribution of the groundbreaking innovation into mainstream markets is enabled by various drivers, such as support from influential stakeholders, such as incumbent firms, and policymakers, improved performance, and economies of scale. At the same time, the diffusion of the groundbreaking innovation is facilitated by developments taking place at the landscape level, which exert pressure of the current socio-technical regime. These developments can be varied, may be the result of slowly unfolding, long-term processes, or can emerge suddenly. Examples of such developments are ageing populations, market shocks, wars, pandemics, globalisation. What is important is that these landscape developments lead to tensions and the emergence of 'windows of opportunity' for the innovation to break through and gain wider adoption within the current socio-technical regime. As such, this transition phase is marked by fierce struggles between established actors and new entrants; heated debates about necessary adjustments to laws, regulations, policies, etc.; discursive, public confrontations about the framing of relevant problems and what would constitute viable solutions. The diffusion of the innovation starts to be facilitated by infrastructural adjustments, emerging business models, changes in the understanding and dominance of specific societal values.

Phase 4. A new socio-technical regime, whose emergence has been contributed to by the upscaling and diffusion of the groundbreaking innovation, replaces the old one. This transformation is rendered manifest through the development and stabilisation of new institutions, ways of working, policy instruments, novel standards, principles, rules of thumb, new understandings about relevant concepts, such as health, preventive health in our case.

It is important to emphasise that the **trajectory of transition** pathways is not linear, nor deterministic (Geels et al, 2016). Rather, the development, alignment, and diffusion of niche innovations are influenced by complex interactions between multiple actors, technologies, and institutions and by broader landscape dynamics. Moreover, these trajectories take many forms. Next to the technological substitution trajectory as reflected by the four phases above, Geels and colleagues (2016) proposed three other types of transition pathways. A transformation pathway occurs when changes to the existing regime are performed gradually

by incumbent actors, who experience landscape pressure, while no niche innovations is sufficiently able to make an impact on the regime level. A reconfiguration pathway unfolds when niche innovations are available that are both sufficiently mature and compatible with the incumbent regime. The latter absorbs them and undergoes adjustments as a result, but its core structures remain largely intact. The de-alignment and re-alignment pathway occurs when landscape pressure destabilise the incumbent regime while no niche innovations are sufficiently mature to help replace it, leading to a period of uncertainty. Eventually a new regime will coalesce around one niche innovation[3].

In developing the preventive health transition pathways, we used the **backcasting approach** proposed by Quist (2007), which is strategy-oriented and characterised by a high degree of applicability. According to Quist (2011:884), "[b]ackcasting is particularly useful in case of highly complex problems; when there is a need for major changes, when dominant trends and externalities are part of the problem and when the scope and time-horizon involved are broad enough to leave room for the development and implementation of very different alternatives." Key processes in backcasting are engaging stakeholders to develop visions and transition pathways; developing a shared understanding of desirable futures; learning and network building across different domains; taking actionable steps to bring the intended substantial change about. For backcasting we need a clear picture of the current regime and its rules (research question 1), a desirable future vision and the multiple, pluriform transition pathways leading towards this vision (research question 2). How these steps are taken is conveyed in the next section.

3. Methodology

In line with what is common practice in applying the MLP framework introduced in the previous chapter, we used different data collection methods. These methods are used to acquire necessary information about: the current preventive health regime; about niche innovations, visions of desirable preventive health futures; and the main goals, activities and actors considered for determining the pathways whereby these futures could be reached. An overview of the main data collected and its analytical purposes can be found in the table below.

Data collection

Table 1: Overview of main data collected

Type of data:	**Sample:**	**Analytical focus:**	**Actors covered:**

[3] Although we do not explicitly use this typology in this White Paper, being aware of it can help researchers and policymakers reflect on which transition pathway is most or least likely to unfold in preventive health, anticipate potential bottlenecks, and determine which configuration of actors, institutions, and practices are more likely to contribute to systemic change. It can also help identify leverage points where niche innovation could penetrate and transform the current preventive health regime, thereby contributing to more strategic planning and interventions.

Policy documents	13 Dutch national policy and strategy documents	Regime dimensions: Policy & Governance; Culture	Ministries, RIVM, advisory councils, funding agencies
	3 WHO reports	Regime dimensions: Policy & Governance; Science & Technology	WHO; global health governance actors
Academic literature	37 academic articles identified through literature review	Regime dimensions: Science & Technology	Public health scholars; epidemiologists; behavioural researchers; social scientists
	6 expert-recommended academic publications		
Funding bodies summaries	NWO, ZonMw, I4PH-funded preventive health projects	Regime dimensions: Science & Technology; Policy & Governance	National research organisations; research councils; universities; research institutes
Corporate & industry materials	Online information; company reports; press releases	Regime dimensions: Business & Industry; Users & Markets	Food & beverage companies; Big Tech companies; fitness/wellness companies; insurers
Media materials	Dutch and international media reports on preventive health	Regime dimensions: Culture; Business & Industry; Users & Markets	(social)media outlets; industry commentators; journalists, bloggers, etc.
Semi-structured expert interviews	24 researchers in different domains, policy-makers, intermediaries, I4PH members	All regime dimensions; niche innovation identifications; future visions ; elements & actors of the transition pathways	researchers in different domains, policymakers, practitioners, I4PH members
Citizen panels	2 Utrecht & Wageningen	Regime dimensions: Users	Citizens with low socio-economic status

		& Markets; Culture; niche innovation identifications; future visions ; elements & actors of the transition pathways	
Validation workshop	1	All regime dimensions; future visions	Researchers ; policymakers ; practitioners
Co-creation workshops	2	Niche innovations future visions; elements & actors of the transition pathways	Researchers ; policymakers ; practitioners; civil society representatives

Document analysis

The core of our dataset consists of policy documents, academic publications, and grey literature related to preventive health. Via purposive sampling we collected and analysed **documents, policy briefs, and reports** using search terms including "preventieve gezondheid", "preventieve" and "preventieve gezondheidszorg" in Google Scholar and Nexus. As the publication of the Nationaal Preventieakkoord in 2018 provides an important milestone, we selected documents and policy briefs published from then onwards. 13 documents focused on preventive health in the Netherlands, 3 documents and briefs published by the World Health Organisation were added to better understand how and to what extent Dutch preventive health approaches are aligned with and shaped by global trends in this domain.

The initial body of documents was enriched by 43 **academic publications** identified using purposive sampling. We focused on preventive health and/or specific aspects of preventive health. Articles were searched using search terms such as "prevention", "preventive health [children/youth/elderly/aging]", "preventieve gezondheid", "preventive", "preventieve gezondheid zorg", "healthy living/ environments", "positive health", "planetary health", "social/economic/environmental determinants of health" in Google Scholar and Web of Science. Search terms were informed by a preliminary analysis of the policy documents collected, by aspects that emerged as relevant through the semi-structured interviews we conducted in parallel, and by the need to develop insights about already existing, but also novel practices and initiatives in the field of preventive health.

To capture insights about current preventive health approaches and new and emerging technologies and initiatives considered or undertaken by commercial actors, reports about the their activities and press releases and mainstream pieces focusing on expectations about their role and influence in preventive health were also collected. In our document analysis, we focused on identifying how preventive health was conceptualised; which actors were involved, which practices and technologies were mentioned, and how responsibilities and problems were framed across the different rule dimensions covering the regime.

Interviews

24 semi-structured **interviews** were conducted with experts including academic researchers focusing on different preventive health areas, such as public health, youth studies, mental health, urban planning, education providers, policy-makers, and actors facilitating inter-transdisciplinary collaborations. The interviewees were identified using a combination of purposive sampling and snowballing techniques, based on the document and academic article analysis and personal recommendations. Considering the I4PH's ambitions to shape and strengthen preventive health in the Netherlands, representatives of the I4PH's management team were also interviewed.

The interview guide was informed by the Multi-Level Perspective framework and wider Transition Studies literature, and focused on: dominant practices, actors, and institutional arrangements within the current preventive health regime; perceived tensions, failures, challenges; emerging niche innovations and experimental practices; visions of a desirable future preventive health system; enabling and constraining factors for preventive health transitions

The interviews were transcribed and analysed thematically to identify recurring patterns and underlying rule structures.

Workshops

To take stock of the experiences, future expectations and concerns of people living in low socio-economic conditions, two **workshops** were held with representatives of the citizen panel in Utrecht and Wageningen. In Utrecht, the dialogue session focused on the participants' future preventive health visions. In Wageningen, the dialogue focused on validating emerging findings about main features of the current preventive health regime in the Netherlands based on the participants' experiential knowledge.

Emerging findings about the current preventive health regime in the Netherlands were validated during two subsequent sessions, one with I4PH representatives and Transition Studies and Preventive Health experts (September 2025), and one with different stakeholders, including academics, policymakers, civil society, commercial actors (November 2025). The collected data were compared with the emerging findings and where necessary adjustments to the identified rules and emerging tensions were made based on them.

To collect data about the future expectations about preventive health of different types of stakeholders, two co-creation workshops were held during the Preventive Health Conference (November 2025) and the EWUU Alliance Community Day (December 2025). The participants were invited to mention niche innovations they found promising, to employ creative means to articulate relevant activities and elements of desired preventive health transitions, to identify stakeholders likely to support or resist the transition, to specify resources needed, etc. In addition, insights into potentially relevant niche innovations were also acquired based on recommendations subsequently made by participants to these workshops, by collecting data from participation at seminars and conferences on relevant topics, and by conducting online searches. The data, including text and images, were analysed thematically, drawing on concepts from Transition Studies, to identify recurrent patterns in the participants' visions of desirable preventive health futures, emerging niche innovations, enabling and constraining factors, and the roles attributed to different actors. As described in more detail below, these findings informed the classification of niche innovations and the development of the preventive health transition pathways.

Analysis

In line with the goals of this study, the collected data were analysed using thematic analysis, combined with an abductive analytical approach informed by our engagement with Transition Studies literature (see Section 2). This approach enabled us to engage in an iterative dialogue with the empirical materials and the main theoretical concepts in our study. The analysis focused on the current preventive health regime structure and organisation; niche developments; and the development of four preventive health transition pathways.

Regime

In line with the regime-mapping approach proposed by Kanger et al (2024), we structured our analysis across a set of **five regime rule dimensions** that capture the main domains in which the rules currently shaping preventive health in the Netherlands are articulated, coordinated, and enacted. Focusing on these dimensions allowed us to systematically analyse the rules shaping activities across this complex and broadly distributed regime. Our analysis focused on five dimensions: Science and Technology; Business and Industry; Policy and Governance; Users and Markets; Culture. In our analysis, we did not treat these dimensions as separate, but approached them as co-evolving rule domains within the broader preventive health system. This enabled us to identify the main practices, institutional arrangements, technological infrastructures, and dominant perspectives and values that orient how preventive health is currently organised in the Netherlands.

Niches

We used insights from Transition Studies and analysed the collected data, including textual and visual materials, to identify emerging niches. We grouped these niches into six analytically distinct but empirically entwined categories: technological, institutional, governance, financial and market, and social innovations. Technological innovation niches are protected

spaces where new tools and approaches, such as digital health trackers, data infrastructures, are tested and refined, with an eye on enhancing their performance, usability, and scalability. Institutional innovation niches enable the creation of organisational forms and cross-sectoral arrangements, to facilitate coordination, resource sharing, and collaborative decision-making. Governance innovation niches are protected spaces where new policy instruments, regulatory approaches, and coordination mechanisms are developed and tested to advance preventive-health objectives. Financial and market innovation niches foster the development, exploration, and experimentation with alternative business models, reimbursement mechanisms and investment strategies, to better support new and emerging preventive health technologies and interventions. Social innovation niches refer to spaces where novel community-based initiatives, participatory approaches, and collaborations emerge, to address unmet health needs and to stimulate collective action.

Preventive health transition pathways

To develop the preventive health transition pathways, we analysed the collected data, including textual and visual materials, focusing on: main goals for a desirable preventive health future; key changes/activities/developments; the actors expected to support these activities; the actors expected to resist/oppose these activities; key enablers; key barriers; underlying values and normative orientations. This enabled us to distinguish four main goals or directions for a future preventive health system, around which we developed the transition pathways.

Considering the type and amount of data collected and in line with Transition Studies approaches to scenario development, we did not structure the preventive health transition pathways along fixed, clearly demarcated chronological sequences.. Instead, we organised them into three temporal phases: near future; mid-term future; long-term future (closest to 2050). In so doing, we combined the early phases of experimentation and stabilisation distinguished in the Multi-Level Perspective (Fig. 1), which are difficult to disentangle prospectively. This is because in practice experimenting with niche innovations, collective learning, network development and expansion, and institutional embedding tend to unfold in parallel and to mutually reinforce each other. Thus, the three phases we used should be understood as heuristic constructs that help structure and organise possible activities rather than as carefully timed forecasts about the when these activities will or should take place. The distribution of activities across the three phases was guided by: insights from the regime analysis regarding the current system functioning and constraints; identification of niche innovations; the expected degree of institutional, technological, and behavioural change required; the amount and type of actors needed to enable the considered changes; the degree of path dependency and system lock-in.

In line with Transition Studies literature, which emphasises that socio-technical transitions require deep institutional restructuring rather than incremental change, our analytical starting point for each pathway was the identification of necessary institutional and regulatory transformations. These were interpreted as necessary scaffolding elements,

enabling subsequent technological, behavioural, and market changes. We further incorporated insights from our regime analysis regarding: actor collaborations; conflicting interests, priorities, mandates; alignment and misalignment across the various regime dimensions. It is important to mention that we did not include changes that would require landscape-level transformations as a precondition, as these fall outside the area of influence of any one type of transition actor and typically cannot be addressed based on individual transition strategies

The key enablers and barriers mentioned stem from the data we collected, especially those focusing on structural and recent developments. The enablers and barriers associated with the near-future stemmed from empirical materials, whereas those associated with mid- and long-term phases were derived abductively, by considering both the empirical data and our knowledge of the particularities of the preventive health system, and transition dynamics.

Overall, the four pathways presented in this paper should be interpreted as tentative blueprints or forecasts. They are analytical constructs synthesising dominant and emerging expectations about a desirable future preventive health system in the Netherlands. As such, they are meant to inspire dialogue, debate, and the development of shared goals.

In the following chapters, we first present the main rules that structure and orient activities within the current preventive health regime in the Netherlands (Section 4). We then provide an overview of the main niche innovations identified in the analysis, highlighting their main characteristics (Section 5). Subsequently, we introduce the overarching vision for a future preventive health system (Section 6) and elaborate four transition pathways through which this vision may be realised (Section 7). The paper concludes with a discussion of the commonalities and tensions across these pathways, followed by a reflection on the limitations of the study and implications for future research on preventive health transitions (Section 8).

4. The current preventive health regime and its rules

We provide an overview of the main rules we identified and highlight promising emerging ones in Table 2. The rules grouped in the five system dimensions are elaborated under the table.

Table 2. The rules (categorised in five main dimensions) of the preventive health regime in the Netherlands and its manifestations.

Dimensions	Rules	Examples of how rules are manifested
Science and Technology	Reduce health risks	Screening for chronic diseases, cancer, vaccination
	Research health holistically	Tailored Lifestyles; MetaHealth; Exposome-NL
	Collect and use real-world health data to research health determinants	Amsterdam UMC Digital Health; digital biomarkers & digital phenotyping research projects; development of large health databases
	Use traditional hierarchy of evidence	RCTs, longitudinal cohort studies
Business and Industry	Commodify health	Philips HealthSuite Health app; OpenUp; Well at Work Monitor
	Advertise the benefits of the preventive health products and services	Commercial campaigns for preventive health products and services, such as for Oura ring, data-driven social media ads for weight loss apps and online/offline programs, etc.
	Personalise preventive health	Molecular and genetic tests directly available for citizens to purchase, so that they become aware of personal propensity to certain diseases, sensitivity to certain substances, etc; Minddistrict and other similar platforms providing personalisable coaching and interventions
	Monetise people's health concerns	"Free" apps for running, sleep and food intake monitoring; products through which multiple

		diverse health markers can be monitored and integrated; smart beds and home environments
	Lobby for status quo	Lobbying against stricter sugar and nutrition regulation; lobbying against further restriction on commercialisation of certain products, such as vapes, alcohol, etc.
Policy and Governance	Promote health and prevent disease	Guidelines, documents framing specific behaviours as healthy, and other behaviours as unhealthy; linking lifestyle aspects to the development and onset of specific diseases
	Target groups of people deemed to be in vulnerable situations	Documents and strategy agendas specifically addressing the health challenges of people framed as living in vulnerable situations, i.e. having low socio-economic status, low education attainment, etc.
	Design healthy(ier) living environments	Research funding for health inequity; urban planning focus on active and safe mobility; regreening; laws and rules recommending and, respectively prohibiting construction materials; home & neighbourhood (re)design with focus on specific determinants of health; development of green buffers; noise-reduction urban layouts; climate-resilient urban infrastructure
	Promote participation and civic engagement	Strategies and approaches to involve citizens in (re)designing new neighbourhoods, to become more climate proof, socially resilient, age-

		friendly, inclusive, dementia-friendly; policy documents calling upon people to become actively involved in their health and contribute to healthy living environments instead of expecting public bodies/the government to do so
	Foster digital preventive health initiatives	Fund and encourage the development and use of e-health tools; data-driven preventive health approaches
	Educate about health and combat health misinformation	Health schools; literacy campaigns on nutrition, hygiene, physical activity etc., Nutri-score systems; media campaigns about (un)healthy behaviours courses in collaboration with celebrities and/or influencers; workshops, education, etc.
	Maintain the fragmentation of preventive health	Different funding and governance structures for screening and monitoring institutions, for public health organisations, such as GGDs
	Deploy a broad set of positive and negative measures to promote health and prevent disease	Increasing tobacco taxes; introduction of taxes on sugar-sweetened beverages; minimum alcohol purchase age; subsidies for clean technologies
Users and Markets	Bring to the market devices and services targeting specific markers of physical and mental health and wellbeing of individuals and groups across settings and activities	Continuing increases in (digital) products and services focusing on weight loss; diet; sleep quality, social activity monitoring
	Constantly explore and engage with new preventive health products and services	Use of different preventive health products and services, switching between them, taking advantage of offers and 'trial periods'

	Expect tailored, personalised preventive health interventions	Increases in personalised preventive health products and services available
	Expect to rely not only on formal markets, but also on alternative ones	Alternative or complementary approaches to improve one's mental health and wellbeing, such as acupuncture, medication, yoga, etc.
Culture	Regard oneself as an autonomous, self-interested actor and claim the right to be the main decision-makers in regard to one's health	The quantified self-movement; lifestyle responsibilisation; 'Ik pas' campaigns; "You only live once!"
	Produce and consume diverse health information as means of empowerment	Expected availability & accessibility of different types of health information; proto-patients; health professionalisation of citizens; changing relations between citizens and health(care) professionals; use of 'Dr. Google'; sharing health experiences/ experiences with particular preventive health products and services online.
	Behave in a solidary way in relation to preventive health	Consciously choosing for vegan diets, active mobility, to diminish planetary harmful impacts; abstaining from unhealthy behaviours to protect others
	Link preventive health to aesthetic values	Feeling good while/as a result of healthy behaviours; focus on enjoyment, quality of life in line with one's personal interests and preferences
	Link preventive health to identity	Patterns of consumption, physical activity, means of transportation choice as indicators of social groups one (aspires to) belongs to; food politics

	Approach preventive health as a communal concern	Focus on collective impacts of social, environmental determinants of health; increase in community-based initiatives, regional and national networks, such as 'Alles is Gezondheid'
	Act as a preventive health agent and advocate	Volunteering; participation in informal support groups for smoking cessation, physical activity; 'Adopt a street'; diverse advocacy efforts, such as participation in initiatives for healthy meals in education and work environments, for responsible use of digital technologies in schools; collaborations with municipalities and urban planners to design green areas, walking paths, etc.

Science & Technology

From our analysis, four interrelated rules emerge that structure and guide the preventive health regime in the Netherlands: (1) reduce health risks; (2) research health holistically; (3) collect and use real-world data (RWD) to study health determinants; and (4) apply the traditional hierarchy of evidence in evaluating interventions.

Rules

The dominant and deeply institutionalised rule within the preventive health regime is to **reduce health risks**. This reflects a long-standing orientation within public health and epidemiology towards disease prevention through risk identification and mitigation. This rule involves reducing disease incidence, limiting harmful exposures, and managing population-level risk factors through standardised and measurable interventions. These interventions are typically evaluated using randomised controlled trials (RCTs), longitudinal cohort studies, and cost-effectiveness analyses, which reflect established biomedical standards of evidence.

A second, increasingly important rule is to **research health holistically**. This rule reflects the growing recognition that health outcomes result from complex interactions between biological, social, environmental, and behavioural determinants. This rule is manifested in the call for and application of systems-oriented and interdisciplinary research approaches in preventive health, including complex systems modelling (Ter Ellen et al., 2025) and large-scale integrative research programs. It also underlies a growing focus on mental health as an important element shaping one's overall health and requiring better insights for more effective interventions. Emerging planetary health approaches that link biodiversity loss and environmental degradation to human health outcomes also point towards the growing relevance of this rule. Although this rule is gaining prominence, it seems to be less institutionally embedded than risk-reduction approaches.

A third rule is to **collect and use real-world data (RWD) to study health determinants** and support preventive interventions. This rule is manifested in funding and other efforts made to collect and analyse data generated outside controlled experimental settings, such as data stemming from registries, wearable sensors, mobile applications and digital platforms, environmental monitoring systems. The underlying assumption seems to be that RWD may contribute to more a more dynamic and context-sensitive understanding of health determinants and outcomes, as they provide insights about health behaviours and exposures in everyday life.

Despite its growing relevance, several institutional barriers constrain this rule. Interviewees highlighted as particularly important the lack of clear guidelines for data sharing and secondary use across organisations; fragmented and incompatible IT infrastructures; and insufficient structural funding for maintaining digital health data systems beyond project-based cycles.

The fourth rule we identified in our analysis is to **use the traditional hierarchy of evidence.** Despite increasing interest in complex and data-driven approaches, the traditional hierarchy of evidence remains the dominant evaluative framework in preventive health research. In line with biomedical conventions, intervention effectiveness is primarily assessed using RCTs, longitudinal cohort studies, and cost-effectiveness analyses. This rule prioritises controlled, measurable, quantifiable evidence at the detriment of context- and person/group-sensitive criteria and markers.

Several interviewees critically reflected on this dominant rule. One public health expert argued that it constrains the ability to evaluate population level and contextual interventions:

> *"I sincerely believe that the current way of looking at evidence in research is hampering us, because evidence-based medicine is very strongly biased towards individual approaches, because you cannot randomise the social context of disease…" (*I1)

Similarly, a healthy environments expert emphasised that this rule limits innovation and reinforces conservative funding structures: "We need more odd in science… Let people experiment. Let's be crazy… The system is safe, go beyond safety." (I2) Such perspectives suggest that the currently dominant evidence hierarchy may hinder the evaluation and funding of innovative or system-level preventive health interventions.

Synthesis and emerging tensions

Taken together, these four rules reveal an emerging structural tension within the preventive health regime. On the one hand, the regime remains strongly anchored in risk reduction approaches and traditional evidence hierarchies, which prioritise standardisation, measurability, and controlled evaluation. On the other hand, increasing momentum seems to be building up toward holistic, systems-based, and data-intensive approaches that more adequately engage with the complexity of health determinants, the diversity of health contexts, and real-world dynamics. This tension points towards a potential misalignment between emerging preventive health practices, which are often complex, interdisciplinary, and data-intensive, and dominant evaluation frameworks that remain oriented towards simplified, controlled forms of evidence**.** The tension is likely to shape future debates about what counts as valid knowledge, effective intervention, and legitimate preventive health policy.

Business & Industry

Our analysis identifies five interrelated rules that structure the activities of commercial actors within the preventive health regime: (1) commodify health; (2) advertise and promote preventive health solutions; (3) personalise preventive health; (4) monetise health data and self-monitoring practices; and (5) protect existing market arrangements and revenue models.

Rules

A dominant rule is to **commodify health** by translating health-related concerns, risks, and aspirations into marketable products and services. In recent years, both established corporations and start-ups have developed a growing range of preventive health offerings aimed at individuals, employers, and healthcare providers. Beyond digital health, business and industry representatives have expanded their activities into areas such as personalised nutrition, fitness services, and preventive therapeutics. Collectively, these developments indicate that health is increasingly framed as an economic asset, which can generate important benefits in terms of productivity, employability, resilience, and longevity. At the same time, actors within this dimension actively identify and segment new target groups by linking specific combinations of age, gender, occupation, family circumstances, or health risks to tailored preventive offerings. In doing so, they transform emerging health concerns into new market opportunities.

The second rule orienting activities within this dimension is to **actively promote preventive health products and services**. This rule informs the investment of considerable resources in understanding consumer preferences and developing targeted marketing strategies that position specific products as desirable, effective, and necessary. These promotional activities occur through multiple channels, including social media, mass-media, community events, partnerships with influential figures, and employer networks. This rule thus highlights that preventive health is currently thought to require not only product development but also the active creation of demand through persuasive communication and consumer engagement.

A third rule we identified is to **personalise preventive health interventions and services.** Thus, the actors within this dimension increasingly address individuals as self-managing consumers whose biological characteristics, health risks, preferences, and lifestyle goals differ in measurable ways. As a result, preventive health products are becoming increasingly tailored and granular, addressing different types of users thought to have specific needs, preferences, and interests. This rule seems to reflect a broader shift towards precision prevention, where prevention is expected to become increasingly individualised, data-driven, and adaptive.

The fourth rule we identified is **to monetise health data** and continuous self-monitoring**.** This rule is manifested in the increasing tendency (to expect) to generate commercial value through the collection, analysis, and use of diverse personal health data. This rule contributes to a reframing of preventive health as an ongoing lifestyle project in which individuals continuously generate data about their bodies, behaviours, and the environments they are active in. Importantly, such data are not only used for epistemic and self-management purposes, but to develop and improve preventive health products and services. The relevance of the latter is often emphasised through references to anticipated gains in vitality, productivity, reduced absenteeism, and improved performance in both professional and leisurely activities. The interaction between preventive health and insurance markets further

testifies to this rule. In the Netherlands, preventive services are generally reimbursed only for individuals deemed to be at elevated risk or through supplementary insurance packages and out-of-pocket payments. Thus, access to many preventive services is still largely mediated through market mechanisms and individual financial capital available for health. Whereas most interviewees decried this approach, a small number thereof, including the ethicist quoted below, believed the enactment of this rule could be beneficial:

> *"One of the reasons that there hasn't been a lot of creative thought in the realm of preventive health [is] because there haven't been ways to capitalise on that (…) People think that would be exploiting people who don't have enough money, and you would be kind of unduly forcing them into these [fitness or diet] regimes, because they don't have enough money to pay for their insurance. I think this can be a concern, but I don't think it should be a major concern."* (I3)

The fifth rule we identified in our analysis is to **lobby for the status quo**, which is manifested in the tendency of many actors in this dimension to protect existing governance arrangements and business models**.** This includes lobbying activities at regional, national and international levels, public communication campaigns, and participation in policy debates aimed at influencing regulatory developments. Many interviewees pointed to efforts by commercial actors to discourage stricter regulation concerning the marketing of preventive health products, evidentiary requirements for health claims, or fiscal measures affecting health-related consumption patterns. This rule therefore contributes to considerable efforts being made to maintain current institutional conditions deemed favourable by actors in this dimension and to reduce or even do away with initiatives meant to transform the development of preventive health products and services and their commercialisation pathways.

Synthesis and emerging tensions

Taken together, these rules point to an important tension between preventive health understood as a public good, aimed at improving population health, and preventive health understood as a market opportunity, shaped by commercial incentives, health monetisation strategies, and competitive interests. This tension echoes the emerging image of the current preventive health market, that seems to be simultaneously expanding and shrinking. On the one hand, commercial actors are increasingly commodifying, personalising, and digitalising preventive health, creating new products, services, and business models. In this regard, some of our interviewees suggested that preventive health may create new business opportunities if companies adopt broader and longer-term value perspectives. On the other hand, uncertainty regarding reimbursement, ownership, and value capture seems to limit large-scale investments and diffusion. Commonly mentioned barriers include: weak reimbursement mechanisms; uncertain revenue models; difficulties scaling innovations beyond pilot projects; fragmented responsibilities for prevention; misalignment between those expected to invest in prevention and those likely to capture its long-term benefits. Several participants even

referred to the “absence of a preventive health market” or argued that “there are currently no owners of prevention”. In addition, there were also interviewees who pointed to a misalignment between the actors expected to invest in preventive health and the actors likely to capture the long-term gains from these investments.

Policy & governance

Our analysis identifies six main rules that structure policy and governance activities within the Dutch preventive health regime: (1) promote health and prevent disease; (2) target groups of people deemed to be in vulnerable situations; (3) design healthy(ier) living environments; (4) promote participation and civic engagement; (5) promote digital preventive health interventions; (6) educate about health to empower and combat misinformation; (7) maintain the fragmentation of preventive health; (8) deploy fragmented governance arrangements.

Rules

The first rule we identified at the heart of this dimension is to **promote health and prevent disease.** This objective is typically pursued by identifying and targeting behaviours and risk factors considered to have the greatest impact on population health and healthcare costs. GFor instance, national strategies focus strongly on reducing smoking, harmful alcohol consumption, obesity, and other lifestyle-related risks. This rule points to a focus in the governance of preventive health on risk management, early intervention, and population-level health improvement.

The second increasingly prominent rule is **to prioritise groups deemed to be in vulnerable situations.** As health inequalities have become a central policy concern, vulnerable situations are understood to emerge through specific configurations of low socio-economic status, and/or educational attainment, ethnicity, and neighbourhood characteristics. This rule manifests itself in targeted interventions, local or neighbourhood-specific programs, and funding schemes directed at so-called disadvantaged communities. It is also reflected in research agendas and grant programs that emphasise health equity and social inclusion. More recently, climate-related risks have become part of this discussion, with policymakers recognising that people in vulnerable situations are often disproportionately affected by rising temperatures and environmental exposures due, amongst others, to inadequate housing conditions:

> *“At present, there are already differences in heat levels between neighbourhoods, with the least affluent neighbourhoods being the warmest. (...) The groups that are least able to find adequate cooling are primarily people struggling to make ends meet, people with vulnerable health, and young adults (aged 18–34).”* (Broeder et al, 2024: 55)

While this rule indicates that health inequalities are a recognised and important concern, several interviewees questioned whether existing interventions are sufficient to reverse widening health gaps.

The third rule we identified is **to design healthy living environments,** especially by addressing broader determinants of health. In ways that echo holistic understandings of health, policy attention has expanded beyond individual behaviours onto factors such as neighbourhood design, access to green spaces, opportunities for physical activity, social cohesion, and housing quality. Manifestations of this rule include municipal guidance programs such as *Preventie in de wijk* and the broader focus of the *Samenhangende Preventiestrategie* (2025), which addresses health across multiple environments, including homes, schools, workplaces, and digital environments. While planetary concerns are not yet directly mentioned in health policies, some of our interviewees suggested that they shape relevant guidelines and recommendations, such as decreased meat consumption. The following insight shared by a policymaker is illustrative in this regard:

> "*For food, for example, we have now developed new recommendations. And the impacts on planetary health and also the health of the future generations is definitely a value that is incorporated in the development of the guidelines, whereas it's not the case in [the recommendations issued in] 2015. So that's a change."* (I4)

The fourth rule orienting activities within this dimension is **to promote participation and civic engagement.** The growing recognition of the diverse needs, experiences, and forms of knowledge available within different communities has led policymakers to increasingly promote citizen engagement and the development of initiatives based on approaches deemed co-creative. However, our interviewees frequently noted that participation remains uneven and is sometimes restricted to consultation processes with limited influence on decision-making:

> *"You should really, put in effort to reach all different groups and hear their voices. There's also a risk of tokenism. (…). If you only involve citizens when all kind of decisions are already made and then say, 'well, we have option A or B. What do you think?' People should be engaged in the whole process and, yeah, their voice should be taken seriously"* (I5)

The fifth rule we identified within this dimension is **to promote digital preventive health interventions**. This rule is manifested in funding being increasingly directed towards the development of health data infrastructures, digital monitoring systems, online preventive interventions, and tools that facilitate collaboration between different types of professionals.

The sixth rule we identified is to **educate about health and combat misinformation**. This rule seems to be informed by the assumption that unhealthy behaviours are at least partly the

result of insufficient or inaccurate knowledge. Consequently, numerous and diverse initiatives, such as awareness campaigns, the provision of accessible health information on the websites of public organisations and governmental agencies, the publication of diverse guidelines, have been funded and encouraged.

The seventh rule we identified is **to use a combination of regulatory, fiscal, and behavioural measures to encourage healthier choices and discourage unhealthy behaviours.** Manifestations of this rule include smoking bans, restrictions on the selling and consumption of alcohol in certain venues and to certain age categories, public health campaigns, and various incentives aimed at promoting healthier lifestyles. The variety of measures this rule has informed denotes the efforts of Dutch policymakers to develop regulation and governance approaches that would be effective, yet not deemed excessively paternalistic and consequently largely resisted by the population. The healthy freedom of choice rationale, which helps justify and legitimate measures that steer behaviour without excessively limiting individual autonomy, is indicative of this challenge. It also reflects an ongoing tension between more interventionist forms of health regulation and governance approaches that foreground individual responsibility and empowerment.

The eighth rule that underlies and shapes activities in this dimension is **to maintain fragmented preventive health governance arrangements.** Preventive health responsibilities are distributed across ministries, municipalities, public health services, healthcare providers, insurers, and numerous other actors. These organisations operate under different mandates, funding streams, and accountability structures, making cross-sectoral collaboration difficult. This was amply echoed by our interviewees, who described preventive health challenges as 'wicked problems' requiring coordinated action across sectors, while simultaneously pointing to institutional arrangements that reinforce siloed working practices. Among the barriers they highlighted were separate budgets, conflicting performance indicators, and difficulties establishing long-term collaboration between public and private actors. This rule points to a major contradiction within the current preventive health regime - while the policy discourse increasingly emphasises integrated and holistic approaches, institutional arrangements continue to reproduce fragmentation and compartmentalisation.

Synthesis and emerging tensions

Overall, these eight rules point to an important tension between the growing recognition of the systemic nature of preventive health challenges and present governance arrangements that are still largely organised around sectoral responsibilities and risk-specific interventions. Thus, on the one hand, Dutch policymakers increasingly seek to address structural factors that contribute to ill-health and to reduce health inequities. In so doing, they promote holistic understandings of health, healthier environments, citizen participation, and digital preventive health interventions. On the other hand, the broad ambitions have not been matched by adequate reforms to transform long-standing institutional arrangements, funding mechanisms, and established governance structures, needed to support cross-sectoral interventions capable to address complex determinants of health. In the absence of such

reforms, even the effects of well-intended and well-designed initiatives are likely to be limited, as they will not be based upon cross-sectoral collaborations and shared responsibilities and interests.

Users & Markets

Our analysis identifies four main rules that structure activities within this dimension: (1) bring to the market preventive health products and services targeting diverse physical and mental health markers; (2) continuously explore and engage with new preventive health products and services; (3) expect personalised preventive health products and services; and (4) expect to rely not only on formal markets, but also on alternative ones.

Rules

The first rule we identified is **to bring to the market preventive health preventive health products and services targeting different markers of physical and mental health across different settings and areas of activity.** This rule is manifested in the increasing diversity of the preventive health market, even though it is still relatively small compared to the curative healthcare market (RIVM, 2024). Thus, technology companies, digital health providers, and wellness industries have expanded in recent years the range of their preventive health offerings, which now range from wearable monitoring devices, health applications, and dietary supplements to (mental) wellbeing platforms, and environmental monitoring systems. Underlying this rule is the expectation that individuals can actively manage and improve their health through market-based solutions. Citizens are therefore increasingly addressed as consumers of preventive health products and services rather than as patients (in waiting) or as holders of rights.

The second rule orienting activities within this dimension is that **users should continuously explore and engage with new preventive health products and services.** The fact that dominant framings position new and emerging technologies as viable solutions to a broad variety of health issues combined with the diversification of preventive health offerings has given rise to a situation where individuals and organisations are required to remain attentive to novel products and interventions that promise improved health outcomes. This rule is manifested in growing investments made by employers in diverse wellbeing services meant to improve the health and productivity of their employees, ranging from healthy, plant-based catering to yoga sessions and digital training and applications. Similarly, municipalities and regional actors have adopted various monitoring tools to track environmental and social determinants of health.

The third and increasingly dominant rule we identified is **to expect preventive health interventions to be personalised and tailored to individual needs.** Thus, people are increasingly encouraged to view health risks, behaviours, and prevention strategies as unique to their personal circumstances. Commercial actors reinforce this expectation by bringing to the market personalised nutrition programs, targeted wellbeing services, tailored health advice, and digital tools that adapt recommendations based on the users' characteristics and

behaviours. In so doing, the need for tailored preventive health interventions is framed as arising not only from biological and physiological differences but also from diverse professional circumstances, living environments, lifestyles, and personal preferences. This rule therefore reflects a broader shift towards precision-oriented approaches in preventive health.

The fourth rule we identified is **to rely not only on formal markets, but also on informal ones.** This rule is manifested in the growing availability of alternative health services and well-being-oriented interventions outside the formal preventive health system. While traditional healthcare professionals continue to play an important role as providers of advice on broad range of preventive health topics, such as nutrition and physical activity, users are increasingly expected to experiment with the products, services, and interventions offered by a broader range of actors, such as wellness coaches, fitness professionals, lifestyle advisors, influencers. This rule seems to reflect the acknowledgement of important differences in health beliefs, cultural preferences, and understandings of what constitutes preventive health among individuals and groups. It also highlights the plurality of types of knowledge that users deem trustworthy and relevant, as they experiment with interventions where scientific and experiential knowledge as well as specific worldviews are combined in myriad ways.

Synthesis and emerging tensions

There is a key tension identified in the rules above. On the one hand, we identified efforts and approaches meant to enable individuals to better manage their health, thereby contributing to their empowerment. On the other hand, the rules point towards shifting preventive health responsibilities onto users, which is especially burdensome for those who already have unequal capacities and resources. Thus, the activities within this dimension are increasingly focusing on diversification, personalisation, and consumer involvement. Individuals are expected to experiment with and make informed choices from among a growing range of products, services, and types of knowledge deemed relevant. Yet, the ability to experiment with such diverse offering depends on financial resources, health literacy, digital skills, and access to information, which raises important questions about access, equity, and responsibility. Overall, while the growing diversification of preventive health products and services promoted by these rules may help some groups better manage their health, it is also likely to deepen existing inequalities and even to contribute to new types of inequality.

Culture

Our analysis identifies six main rules shaping activities in this dimension: (1) regard oneself as autonomous actor entitled to be main decision-maker about one's health; (2) produce and consume health information as a means of empowerment; (3) behave in a more solidary way in relation to preventive health; (4) link preventive health to aesthetic values; (5) link preventive health to identity; (6) treat preventive health as a communal concern; (7) act as a preventive health agent and advocate.

Rules

The first dominant rule we identified **is to regard oneself as an autonomous individual** who is primarily **responsible for and entitled to manage his/her/ their own health.** This rule is manifested in materials shared across diverse media addressing individuals as the ones entitled to make decisions about their health, lifestyle and wellbeing. This expectation was strongly reflected in the views shared by several workshop participants and citizen panel members. For instance, even when acknowledging that structural factors importantly shape one's ability to take up healthy behaviours, these participants indicated to "want to have the right to make my own [health] mistakes" (W, January 2025). Similarly, when contemplating the possibility that municipal authorities may prohibit fast food restaurants from his city's centre, another participant stated that such actions would prompt him to immediately go into one (W, October, 2025). As these examples suggest, this rule shapes how preventive health interventions and policies are received and evaluated.

The second rule we identified is to **produce and consume diverse health information as a means of empowerment**. This rule is manifested in the various media and formats through which health information can be currently consumed as well as in the normalisation of behaviours such as conducting multiple searches and consulting distinct sources, to reliably determine how to address a specific health issue. It is also exemplified by widespread practices and expectations of sharing one's experiences with different preventive health products, services, and interventions on different types of online platforms. From this point of view, staying health is framed as a matter of ongoing learning as well as shared reflection practices. This rule is promoted by arguing that becoming knowledgeable and staying informed about factors shaping one's health are means of empowerment, enabling individuals to make better decisions and to interact with experts on a more equal footing, as partners rather than passive recipients of recommendations and advice.

The third rule we identified within this dimension is to **behave in a more solidary way in relation to preventive health**. This rule is manifested in public health campaigns where people are encouraged to take up certain healthy practices or to give up unhealthy behaviours by highlighting the impacts the latter may have upon others. In such materials, making sure that one stays healthy is thus increasingly framed not only as beneficial for the individual but also as a contribution to society, by supporting health-promoting environments, setting the right example, and helping decrease healthcare expenditure. More recently, this notion of solidarity has expanded to include concerns about future generations and planetary health. This is exemplified by public campaigns which link health-related behaviours to environmental sustainability and emphasise the interconnectedness of human health, ecological systems, and long-term societal wellbeing. This rule reflects therefore a shift from approaching health as a private matter towards understanding it as a shared social and environmental responsibility.

The fourth rule we identified is **to link preventive health behaviours to aesthetic values**, such as pleasure and enjoyment. Thus, individuals are encouraged to take up health behaviours

that feel good to them and that allow them to experience joy and satisfaction in the present. For instance, they are advised to go for walks, to consume more vegetables, or to engage in sports not only in view of the long-term health impacts of these practices, but also in order to feel less stressed, more relaxed, and energised in the present. Similarly, the consumption of certain products or even specific approaches to decorating one's home or office are recommended as means to promote mental health.

The fifth rule we identified was **to link preventive health to identity**, manifested through growing tendencies to use health behaviours as markers of identity and group belonging. Thus, one's dietary choices, fitness practices, and self-tracking activities increasingly signal not only a particular lifestyle, but also how people understand and present themselves, their values and social affiliations and/or aspirations. Food consumption seems to have become increasingly politicised (NOS, May 31, 2025), for instance, with a vegetarian or vegan diet being seen as the marks of relatively well-off, highly educated, liberal groups, whereas snack food and soda drinks are framed as being more prevalently consumed by people who are low educated, or who have lower income (Horstman, 2026). Other relevant examples are the so-called quantified-self and qualified-self communities, whose members frame their engagement with digital self-tracking devices as indicative of their commitment to becoming as healthy as possible.

The sixth rule we identified within this dimension is **to treat preventive health as a communal concern**, requiring collective engagement and location interventions. This rule seems to be informed by the growing recognition of the importance of broader determinants of health, shared by smaller or larger groups, such as environmental quality, access to green spaces, mobility, housing, and social cohesion. This rule is manifested in a plethora of local health initiatives, community health events, neighbourhood-based programmes, and collaborative networks such as *Alles is Gezondheid*.

The seventh rule we identified is **to act as a preventive health agent and advocate** within and on behalf of one's community. This rule manifests in contributions ranging from modelling healthy behaviours and supporting friends and family members seeking to give up unhealthy practices, such as smoking, to organising and participating in local health initiatives, such as community walks, neighbourhood health projects, and environmental initiatives such as park clean-ups, or 'adopt a street' initiatives. This rule is also manifested through the mediation work performed by community members acting as intermediaries between their own communities and policymakers, healthcare organisations, municipalities, or other stakeholders. By articulating local concerns and facilitating collaboration, these actors help connect bottom-up experiences with top-down decision-making processes.

Synthesis and emerging tensions

The main tension these rules make apparent concerns the difficulty to balance individual agency and collective responsibility. Many of the rules described above indicate that preventive health is importantly linked to dominant understandings of citisenship,

responsibility, wellbeing, and participation. As a result, individuals are expected both to manage their own health as well as to actively contribute to the wellbeing of their communities. The focus on individual agency risks to downplay the important influence of structural determinants of health, whereas the expectation for community engagement and advocacy risks placing greater demands on some groups rather than others, such as women, unemployed, or retired people who are still in good health.

5. Niche innovations

Preventive health niche innovations emerge in response to limitations, tensions, and unmet needs within the current preventive health regime (Boon et al, 2014). As the previous section indicated, the necessity to address health holistically and tackle broader social and environmental determinants of health is increasingly acknowledged by relevant actors within the Netherlands. Yet, institutional arrangements remain fragmented, funding for preventive health remains limited, and dominant evidence frameworks have a hard time accommodating complex, place-based/context-dependent, system-level interventions. In addition, the growing reliance on market-based and personalised preventive health approaches risks reinforcing existing inequalities, as access to preventive health resources remains unevenly distributed.

Niches constitute protected spaces in which alternative socio-technical configurations can be developed and tested away from the selection pressures exerted by dominant regime structures (Geels, 2002; Boon et al, 2019; Raven et al, 2026). They provide opportunities to experiment with novel technologies, organisational arrangements, governance approaches, funding mechanisms, and forms of community engagement that seek to address the shortcomings of a regime. Niche innovations are therefore relevant not only because they generate novel solutions, but also because they challenge established assumptions about how preventive health should be organised, evaluated, financed, and delivered.

Identifying emerging niches is necessary to determine possible and desirable directions for the transformation of the current preventive health regime. It makes relevant actors aware of innovations that address similar challenges, highlights opportunities for alignment across different domains, and provides insight into the conditions under which preventive health transitions may occur. Mapping current niche innovations and determining how they can be fruitfully brought together to achieve systemic change is therefore crucial for the development of transition pathways. Our analysis identified five interrelated categories of niche innovations: technological, institutional, governance, financial and market, and social (Table 3). We chose to present these different types of innovation niche innovations separately for clarity purposes, but it is important to emphasise that niches frequently overlap and co-evolve. Their transformative potential depends less on the success of any given

individual innovation than on the extent to which multiple and diverse innovations become aligned and mutually reinforcing.

Many of the niche innovations we identified seek to address structural determinants of health, strengthen cross-sector coordination, develop new forms of evidence generation, and create alternative governance and financing arrangements. As such, they can be understood as early manifestations of alternative preventive-health configurations that may contribute to longer-term regime transformation.

The overview of niche innovations presented in Table 3 contains niche innovations at different levels of abstraction, ranging from concrete initiatives and pilot projects, to sketchy outlines and innovation directions. We choose to retain this variation, as indicative of differences in the maturity of these innovations and in the degree to which different actors understand the preventive health challenges these innovations are meant to address.

Table 3. Overview of preventive health niche innovations identified

Niche type	Sub-category	Examples identified	Main function	Main scaling challenges
Technological	Digital prevention & self-monitoring	Evie; Mijn Positieve Gezondheid; Virtuagym; chatbots and other AI-assisted health communication devices; digital lifestyle and wellbeing interventions	Support health monitoring, personalised preventive health, behaviour change, and health literacy	Digital and health literacy inequalities; user (temporary) disengagement; need for institutional and social embedding
	Data infrastructures & preventive health analytics	School-based health platforms; national biomarker repositories; digital monitoring infrastructures; CBS-linked predictive models; environmental and social determinants of health databases	Enable preventive health analytics, reflexive monitoring, coordination, and evidence generation	Data governance complexity; interoperability; lacking/insufficient long-term funding; lacking/insufficient (novel) professional skills and capacities
	Novel screening technologies	Liquid biopsies	Enable earlier risk detection, improve risk stratification and help develop tailored interventions	Clinical integration difficulties; insufficient reimbursement arrangements; limited public awareness & potentially acceptance

Institutional	Cross-sector collaborations/configurations	Sprong PREVENT; Data & Kennishub Gezond Stedelijk Leven; Icelandic Prevention Model; citizen panels	Facilitate coordination, resource sharing, collective learning, and participatory governance	Lacking/insufficient stable funding; limited role clarity; potentially limited institutional legitimacy; difficult to set up long-term collaborations
	Professional role reconfiguration	Hairdressers as health intermediaries; postal workers identifying people in vulnerable situations; pharmacies offering preventive health checks	Extend preventive health services beyond traditional settings	Training requirements; difficult to set up accountability arrangements; potentially limited professional & public acceptance
	Organisational redesign	Redesigned hospitals and GP practices to target preventive health; preventive-health checks jointly organised by GPs and social services; prevention-oriented medical education	Reorient healthcare organisations towards preventive health and health promotion	Resistance to change; workforce development issues; resource constraints
	Epistemic innovations	New indicators for social determinants of health; CBS collaborations; reforms to ethics review and data-governance procedures	Develop novel/ additional/ integrated models of evidence generation, evaluation, and anticipatory governance	Dominance of traditional evidence hierarchies; regulatory constraints; institutional inertia

Governance	Integrated governance approaches	Health in all policies	Embed health considerations across policy domains and governance levels	Varying political commitment; competing policy priorities; coordination complexity
	Behavioural regulation	Mandatory nudging; retail placement restrictions for unhealthy products	Shape health-related behaviours by modifying environments & options available	Limited public acceptance; implementation and enforcement difficulties
	Environmental & commercial regulation	Restrictions on fast-food outlets near schools; limits on unhealthy food advertising; restrictions on unhealthy outlets in city centres	Reduce exposure to unhealthy environments and commercial determinants of health	Questionable political feasibility; strong industry resistance
Financial & market	Funding & investment innovations	Joint preventive-health budgets; public–private funding arrangements; employer co-financed preventive health programs	Mobilise resources and support long-term preventive health investments	Misalignment between investors and beneficiaries; fragmented budgets; short-term political & financial cycles
	Incentive & reimbursement innovations	Value-based insurance; mixed reimbursement schemes	Align financial incentives with preventive health outcomes	Regulatory adaptation difficult & time-consuming; health equity concerns; limited political acceptability
	Market-shaping innovations	New business models for healthy products & services; policies	Stimulate commercial interest and	Uncertain revenue models; preventive-

		supporting preventive-health profitability	investment in preventive health	health markets seen as limited by some commercial actors & investors
Social	Community support infrastructures	Het Klokhuis Wijkcentrum; Austerlitz Zorgt; night embassies	Address multiple health needs through community-based support and care	Lacking/insufficient sustainable funding due to cross-sectoral character of these innovations; limited/varying volunteer capacity; uneven local engagement
	Healthy neighbourhoods	Cartesius; Zorgvrijstaat	Embed preventive health in everyday environments and social relations	Multi-sector coordination complexities; lacking/insufficient long-term investment
	Healthy living environments	Blue Zone-inspired initiatives; empathic homes	Embed preventive health in everyday environments and socio-material relations	Multi-sector coordination complexities; questionable technological feasibility; regulatory complexity; lacking/insufficient long-term investment
	Community participation & education innovations	Medical professionals volunteering to educate in schools; awareness	Strengthen health literacy, social	Difficult to ensure sustained participation; difficult to reach some

		campaigns; supermarket outreach initiatives; neighbourhood walks	cohesion, and healthy behaviours	people in vulnerable situations

Technological innovation niches

As the overview presented in Table 3 indicates, the technological innovations we identified are generally intended to expand knowledge about preventive health, and to support continuous monitoring, personalised prevention, and anticipatory interventions. It is important to note, however, that participants in our study repeatedly emphasised that technological innovations alone were not sufficient to achieve the preventive health transformations they deemed necessary. This is because they perceived the effectiveness of these innovations as depending on novel or adjusted institutional arrangements, social support structures, and governance mechanisms enabling equitable access, sustained engagement, and appropriate use. Thus, the transformative potential of technological innovation niches lies less in their technological performance than in how well they are integrated into broader socio-technical configurations.

Institutional innovation niches

The innovations we identified seek to address one of the main weaknesses of the current preventive health regime, namely its fragmentation. They denote attempts to create new forms of coordination, collaboration, and knowledge exchange between actors that have not traditionally worked together consistently and substantially. These innovations therefore purport to align different forms of expertise, resources, and responsibilities, to challenge existing professional roles and boundaries, and to embed preventive health into a broad range of everyday settings and practices. While this suggests that their transformative potential is considerable, their diffusion will require stable funding, overcoming resistance at different levels, successfully adapting current accountability mechanisms.

Governance innovation niches

The innovations we identified seek to reshape the structural conditions under which preventive health interventions are developed and implemented. Rather than focusing on individuals and targeting behavioural interventions, these innovations aim to transform current environments to facilitate healthy choices and behaviours. Yet, the participants in our study raised concerns that paternalistic perceptions, competing policy priorities, and tensions between different mandates and objectives may stifle the diffusion of these innovations.

Financial and market innovation niches

The innovations we identified seek to address one of the most persistent challenges in preventive health, namely the misalignment between those expected to invest and those who may ultimately benefit from it. The emergence of these innovations suggests broad awareness about the limited incentives for investments in preventive health that current financing structures provide. At the same time, these innovations also testify to the tension between viewing preventive health as a public good and as a market opportunity. The transformative potential of these innovations is likely to depend on the degree to which the dual goals of economic value generation and preventive health outcomes can be aligned.

Social innovation niches

The innovations we identified here seek to strengthen social relations, community capacities, and the development of supportive environments. They address loneliness, social exclusion, trust, resilience, and civic participation, which many of our participants linked to broader health outcomes. Their development suggests an important shift towards approaching preventive health as a collective rather than individual responsibility. As many of these innovations combined technological, institutional, and governance elements, they may successfully function as sites of experimentation, where novel, alternative preventive health configurations are developed and tested.

Overall, the niche innovations we identified reveal an emerging shift from narrowly defined biomedical and behavioural approaches towards holistic understandings of preventive health. While the current preventive health regime continues to focus on risk reduction, sectoral governance, and to use traditional hierarchies of evidence, these innovations seek to address broader social, environmental, and commercial determinants of health. In doing so, they challenge established assumptions about where preventive health should take place, who should be responsible for it, and what types of knowledge should guide the development, implementation, and evaluation of new interventions. Instead, they point towards the emergence of a new preventive health regime that is community-oriented, organised around cross-sectoral collaborations, and functioning based on evidence generated through different through the collection of different types of data and requiring cross-sectoral collaborations through digital technologies. The diversity of innovations we identified and their multiple configurations point towards several preventive health transition pathways.

6. Vision of a future preventive health regime

In line with the values of I4PH and of many actors in its network, we put forward the **vision of a preventive health regime that is effective, just, empathetic and inclusive**. The perceptions of the future that participants shared during the creative activities we organised played an important role in developing this vision. The vision is intended as the main shared direction or 'dot on the horizon' towards which the actions of the various actors in preventive health should ideally coalesce. In the next chapter, we present four preventive health transitions pathways towards this goal, which we developed based on the analysis of the data we collected in this study.

A more elaborate version of the vision is presented below:

In 2050, the Dutch preventive health system has successfully **transitioned towards becoming more effective, just, inclusive and empathetic**. At a societal level, health is understood as a collective public good that emerges from productive interactions between institutions, environments, social practices, and ecological systems. Preventive health is embedded **across sectors**, thereby ensuring that citizens from different socio-economic, educational, and ethnic

backgrounds live together in conditions that promote their physical, mental, and social wellbeing, while respecting planetary boundaries and the wellbeing of other species. **Health differences between groups are reduced by 30%** and **every person lives five years longer in good health** due to tailored long-term interventions focusing on social determinants of health.

Health is at the core of policymaking across all relevant systems, such as education, housing, employment, food, mobility, environment, etc. Preventive health policies are developed and implemented through cross-sectoral and multi-level governance, involving close collaboration between national, regional, municipal, and local actors. Public, private and civil society actors collaborate productively, intensively, and efficiently, as they all recognise that health emerges from interconnected systems rather than isolated interventions. Shared learning and collective responsibility for population health outcomes are promoted. Dedicated cross-sectoral funding streams for prevention are structurally embedded in public budgets, reflecting the prominence of ensuring and maintaining health. They are used for: (1) extensive and long-term infrastructural (re)design and updates, needed to promote safe housing, sustainable employment and food environments, healthy mobility and accessible green spaces; (2) scaling of successful local preventive health initiatives and community-based care practices; (3) stimulating bold research and experiments into diverse health determinants. Guidelines and framework are co-created to clarify roles and responsibilities and develop adequate evaluation approaches and context-sensitive accountability mechanisms. Experimentation, collective learning, and adaptation are widely encouraged, and bureaucratic burdens and complexity are reduced due to a shift in focus from strict compliance to the sharing of best practices and lessons learned.

Preventive health is ensured through the **systemic redesign of physical, social, and economic environments**. The (re)built environments promote physical activity, social interactions, and (mental) wellbeing. At the core of food systems are more sustainable production and consumption patterns. Justice-based labour, housing, and education policies ensure livelihood security across all societal groups. Tailored health education is provided across the age continuum, so that all citizens have the knowledge and skills needed to understand how environmental factors, professionals and social relations, and daily behaviours influence health outcomes. **Solidarity, shared collective responsibility, and active societal engagement** guide individual behaviours. Health choices are made based on a caring and careful balancing between one's own needs and preferences and the overall interests of the community. Technological, institutional, and social innovations will both personalised and population-level effective preventive health strategies. These innovations help monitor and address diverse health risks and facilitate the adjustment of health interventions over time, to enhance and maintain health in dynamic circumstances.

The activities of so-called **'unhealthy industries' are effectively regulated** and strictly monitored, thereby decreasing the availability of unhealthy products and considerably limiting harmful environmental impacts. Adjusted fiscal measures, including targeted taxes

and incentives, reflect the overall societal and environmental costs of production and consumption and adequately address their uneven distribution across locations and societal groups. Commercial actors invest in the development of healthier products, sustainable supply chains, and responsible innovations. The introduced policies help ensure that market incentives are aligned with public health goals, making it both attractive and necessary for companies to contribute to improved population health outcomes.

Health objectives and preventive health interventions are developed through the **active involvement of the communities** where they will subsequently be deployed. Community representatives work together with other actors to identify pressing health needs, design effective and empathetic interventions, and determine appropriate evaluation criteria. Decisions about the distribution of necessary resources are made fairly, by acknowledging the relevance of diverse identities and health experiences, and with an eye on ensuring health equity. Dialogue, trust, attention, and respect for the opportunities and struggles different individuals and groups experience in their health-management practices are at the core of all preventive health initiatives.

7. Preventive health transition pathways

The pathways put forward propose different systemic configurations, each oriented towards achieving the main vision described above, albeit through different activities that diverse actors framed as necessary, desirable, legitimate. They present contrasting, yet plausible trajectories through which preventive health could be substantially reconfigured to become more effective, just, inclusive, empathetic. They contain actions and structural transformations that different actors may deem more or less feasible in the foreseeable future. These pathways are based upon and promote different societal values, so they may seem more or less desirable depending on one’s professional and personal norms and opinions. For each pathway, we specify: main goal; regime lock-ins; relevant niche innovations; main activities and developments in Phase I; Phase II; Phase III, key enablers and key barriers (see Table 4).

Table 4. Main elements of the preventive health transition pathways

Element	Transition Pathway I: Making preventive health with all, for all	Transition Pathway II: Making preventive health 'the easy choice'	Transition Pathway III: Making preventive health planetary-cantered	Transition Pathway IV: Making preventive health investable
Goal:	Universal, equitable, community-based preventive health; health as a public good	Healthy behaviours and environments as the new normal	Planetary health integration into preventive health; ecological & interspecies wellbeing	Preventive health as long-term societal investment; improved population health; welfare gains
Regime lock-ins	Health risk reduction focus; fragmented governance; individual responsibility & behaviour change focus;	Insufficient attention for social determinants of health; 'unhealthy industries' influence; individual responsibility & behaviour change focus	Human-centric preventive health focus; separate governance approaches for health & environment; targeted-group interventions rather than structural redesign; prioritisation of economic growth	Treatment reimbursement dominance; limited preventive health budgets; short-term political and financial cycles; long-term horizon of preventive health returns on investment (ROI)
Niche innovations	Participatory preventive health budgets; community centres; healthy or 'caring neighbourhoods' urban	Active mobility-enhancing urban design; zoning restrictions & fiscal measures; mandatory nudges	Planetary health metrics; community sustainability health initiatives; green infrastructure pilots;	Societal return-on-investment models; public-private preventive health investment funds; employer-

	living labs; local integrated health platforms;		integrated environmental-health databases	funded preventive health programs
Phase I	Build cross-sectoral alliances; initiate legislative & funding reforms	Strengthen evidence base; pilot zoning & fiscal measures & physical activity-promoting infrastructure	Include planetary objectives into preventive health policy; develop planetary health assessment frameworks; set up multi-stakeholder collaborations	Establish national preventive health authority; preventive health dedicated budgets
Phase II	Institutionalise "Health in All Policies"; expand social services; deploy community governance in local preventive health strategies	Broaden fiscal & regulatory measures; increase healthy public spaces investments; develop affordable healthy food policies; shift community norms & values	Deploy regional & municipal pilots of combined environmental & health interventions; use integrated digital monitoring platforms; provide planetary health education	Expand preventive health joint funds; expand education on preventive health & long-term monitoring capacities
Phase III	Ensure full universal coverage of preventive health services; successfully embed health equity metrics; fully operational participatory governance	Successfully embed preventive health in multi-sector policy; ensure active mobility, healthy food environments, regulated advertising	Institutionalise planetary health metrics; ensure integrated environmental-health monitoring & sustainable infrastructures	Institutionalise preventive health investments; use preventive health targets as performance indicators; ensure long-term financing and monitoring (digital) infrastructure

Key Enablers	Available GGD network & participatory governance models; active communities	Successful precedents in unhealthy behaviour interventions; active communities; policy goals alignment across multiple sectors	Societal awareness of environment and health links; available interdisciplinary research networks; digital capabilities	Growing policy focus on preventive health; development of broader economic and investment evaluation models; growing awareness of long-term societal benefits of preventive health interventions
Key Barriers	Fragmented governance; limited budgets; resource disparities; dependence on whimsical political support	Industry lobbying; legal constraints; paternalism perceptions; digital challenges	Fragmented governance; limited availability & use of planetary health metrics; professional resistance; budgetary constraints	Fragmented governance; long-time ROI horizon; short-term political & financial cycles

7.1 Preventive health transition pathway I: Making preventive health with all, for all

Main goal: In 2050, preventive health in the Netherlands is equitable, universally accessible, and institutionalised as a public good. Preventive health services are community-based, and health policies successfully address social, economic, behavioural, and environmental determinants of health (W, November 25, 2025; W, December 9, 2025). This pathway assumes that health is approached as a shared public responsibility and integrated across all policies domains through a strengthened “Health in All Policies” approach, institutionalised at both ministries and municipalities levels (W, November 7, 2025). Multi-dimensional health interventions are developed through cross-sectoral collaborations and co-created with governmental bodies, public health agencies, commercial actors, children and the youth, aging adults, people with chronic diseases and disabilities, and other relevant societal actors (I 4, 5, 8, 10,17, 24). Important transformations include solidarity-based health insurance, the abolition of the mandatory deductible (in Dutch: ‘eigen risico’), effective measures to address commercial practices that negatively impact health, such as misleading marketing, lobbying, and the design of commercial outlets that encourage unhealthy consumption and behaviours.

Phase I (experimentation & stabilisation): — Building partnerships and reforming the rules. *Cross-sectoral partnerships are established, and legislation is adjusted to create the institutional foundations for the new preventive health system. Reforms focus on (1) eliminating the mandatory individual health insurance deductible, (2) making Health Impact Assessments mandatory across all policy domains, and (3) replacing siloed funding with cross-ministerial financing agreements to reduce fragmentation. Health Impact Assessments systematically assess the effects interventions have on health equity, including differences across people with different socio-economic status. The GGDs formally function as transition brokers, linking healthcare, social services, spatial planning, municipalities, and communities*.

Shared goals between different types of actors across national, regional, and local levels are articulated and formal agreements signed to support integrated preventive health strategies. These agreements prioritise public value creation and include effective safeguards against conflict of interest related to commercial actors. National preventive health data infrastructures are established with governance arrangements that ensure data sovereignty, privacy, equitable access, and effectively prevent the commercialisation of sensitive health data. Mechanisms for meaningful citizen participation are embedded into preventive health governance. Social innovations, such as the citizen panels co-organised with i4PH, are expanded to ensure that experiential knowledge informs research priorities and preventive health interventions. Community health platforms are established to facilitate the co-creation, implementation, and evaluation of preventive health strategies.

Phase II (diffusion): Embedding preventive health in everyday environments

Preventive health is systematically embedded across the environments where people live, learn, work, and age. “Health in all policies” approaches are fully implemented, and preventive

health policies increasingly address poverty, financial insecurity, debt, unemployment, housing quality, and workforce re-skilling. Schools, workplaces, neighbourhoods, and public spaces are designed to support health. Citizens have access to publicly co-funded preventive-health budgets they can apply to activities of their choosing.

Communal spaces, including parks, libraries, neighbourhood centres, such as Het Klokhuis Wijkcentrum in Amersfoort and Austerlitz zorgt, and 'caring neighbourhoods', such as Zorgvrijstraat in Rotterdam, are progressively scaled and integrated into local preventive health systems. They play a crucial role in the provision of social support, community activities, such as workshop, trainings, meals, along with practical assistance regarding diverse everyday challenges, and opportunities for social participation. Incentives, mandates, and regulatory measures support the implementation of cross-sectoral preventive health measures and interventions at national, regional, and local levels. For example, green areas and physical activity facilities become part of transport hubs and residential area developments, while unhealthy food environments in the vicinity of schools, gas stations, and other public facilities are restricted (W, November 25, 2025). Educational curricula incorporate health literacy and wellbeing competencies across different educational levels (W, November 25, 2025; W, December 9, 2025; I 9, 16). Employers integrate (mental) health and well-being into workplace policies (I 15, 18, 20), thereby effectively addressing workload pressure, social safety, job security, unhealthy workplace practices.

Successful local social innovations are systematically evaluated, adapted, and scaled, allowing promising community-based approaches to become integral part of the preventive health system. Their expansion facilitates social interactions among young people, people from different cultural and socio-economic backgrounds, thereby helping enhance social cohesion. Agreements ensure that every citizen has the opportunities and time to participate in local health councils, community health hubs, and other similar governance initiatives. Monitoring systems combine quantitative health data with locally generated indicators, thereby strengthening democratic accountability.

Phase III (instutionalisation): Institutionalising universal preventive health coverage

Preventive health is institutionalised as a public good, and every individual is guaranteed affordable, accessible, and good quality preventive health services. Reductions in inequalities in healthy life expectancy serve as headline indicators. Public health data infrastructures integrate scientific evidence with community-generated insight.

Preventive health services, addressing behavioural, social, economic, and environmental determinants of health become universally accessible across different communities, with numerous opportunities for participatory governance and shared decision-making. Integrated public health data infrastructures enable continuous monitoring, adaptive governance, and context-sensitive evidence-based policy-making.

Key barriers are likely to include: fragmented governance and funding across policy domains; short political and budgeting cycles that discourage long-term investments in preventive health; unequal implementation capacity across municipalities, and resistance from actors whose interests are challenged by stronger regulation and the redistribution of mandates and resources. At the same time, shifts in public opinion in favour of more market-based approaches, varying levels of willingness to participate in community-based governance, and the administrative complexity characterising the latter may also lead to bottlenecks.

Key enablers are likely to include the already existing strong national GGD network and the availability of cross-sector collaboration structures. The gradual institutionalisation of the "Health in All Policies" approach, supported by mandatory Health Impact Assessments, cross-sector funding arrangements, and shared health equity indicators, will strengthen coordination and accountability. The high levels of civic participation and volunteering in the Netherlands combined with growing employer interest in preventive health driven by labour shortages will enhance community engagement and investments in health-promoting environments.

7.2 Preventive health transition pathway II: Making preventive health 'the easy choice'

Main goal: In 2050, preventive health is the dominant approach to health in the Netherlands, with healthy living becoming the easiest, most affordable, and most accessible option for all citizens. Physical, social, commercial, and digital environments are systematically designed to promote health, whereas unhealthy options become less visible, less affordable, and less socially normalised. This pathway assumes an important shift from information-based approaches towards structural preventive health interventions. Housing, food systems, transport infrastructures, public space, and digital environments are aligned with public health objectives, thereby ensuring that healthy choices become the default across everyday settings (W, November 25, 2025; W, December 9, 2025; I6, 10, 12, 17, 22, 23). Important transformations include the widespread use of regulatory, fiscal, spatial, and behavioural policy instruments to reshape health environments, alongside the stronger regulation of commercial determinants of health, such as unhealthy products marketing, digital advertising, and product availability and accessibility.

Phase I (experimentation and stabilisation): — Building the evidence base and political legitimacy. *Efforts focus on establishing institutional, scientific, and political foundations for structural preventive health interventions. Research institutes and academic public-health centres expand evidence and monitoring approaches to assess health equity, behavioural, and economic impacts of environmental, fiscal, and regulatory interventions. Targeted measures are introduced in domains with strong empirical support, such as food environments and physical activity.*

The VWS, EKZ, OCW, and other relevant ministries collaborate to design legislation restricting advertising of unhealthy food and beverages to children across broadcast and digital media. Fiscal measures targeting sugar-sweetened beverages and other unhealthy products are introduced or strengthened. Municipalities begin experimenting with different types of zoning regulations, to limit the density of fast-food outlets near schools (CP, October 2025; W, November 25, 2025). National monitoring systems are established to record and evaluate behavioural responses, health equity impacts, implementation challenges, and unintended consequences, thereby ensuring the development of strong evidence base for future scaling.

Phase II (diffusion): Scaling structural interventions and reshaping environments. *Structural preventive health interventions are embedded across the environments where people live, learn, work, age. Measures expand to additional domains, including alcohol commercialisation and consumption, digital marketing, and active mobility. Growing investments in healthy neighbourhood design, cycling infrastructure, safe walking routes, and affordable healthy food address socio-economic inequalities regarding access to health-promoting environments. Behavioural insights are used in carefully evaluated ways to complement, rather than substitute for, structural measures.*

Fiscal measures are refined based on evaluation results to maximise their effectiveness and equity. Subsidies for fruit, vegetables, and other healthy foods improve their affordability, particularly for people with lower socio-economic status. Restrictions on the availability and marketing of alcohol are strengthened in line with epidemiological evidence. Insights emerging from behavioural research inform the introduction of tailored nudging interventions in schools, workplaces, supermarkets, and digital environments, to further complement structural regulatory and fiscal measures. Collaborations between civil society organisations, schools, employers, and community leaders support the shift towards social norms that promote healthy living. Successful local innovations, such as municipal zoning experiments, active mobility initiatives, and health neighbourhood programs are systematically evaluated, adapted, and scaled.

Phase III (institutionalisation): — Institutionalising healthy environments. *Structural preventive health approaches are the main organising principle for preventive health governance**.** Health Impact Assessments become standard in urban and regional planning. A strengthened supervisory authority monitors compliance with regulations on unhealthy products marketing, product reformulation, commercial practices, and digital advertising. Digital tools support healthy behaviours within strong privacy and data protection safeguards.*

Regulatory and fiscal frameworks are stabilised and periodically updated based on longitudinal evidence on health, health equity, and behavioural outcomes. The cross-sectoral integration of Health Impact Assessments ensures that new housing developments, transport systems, food environments, and public spaces promote physical activity, equitable access to healthy food, and social cohesion. Digital tools are deployed at scale, to support healthy

behaviours through personalised feedback, community-based challenges, and gamified incentives (I 1, 5). Importantly, these technologies function as complements to structural preventive health interventions rather than substitutes for them. Integrated digital systems continuously monitor health, health equity, behavioural change, and environmental conditions, to enable adaptive governance and the periodic refinement of structural preventive health policies.

Key barriers are likely to include resistance to the stronger regulation of unhealthy products and marketing from commercial actors interested in maintaining the status; challenges in enforcing national legislation within increasingly digitalised and cross-border commercial environments; and the unequal implementation capacities if Dutch municipalities. At the same time, the adoption of digital tools and the acceptance of novel preventive health measures is likely to vary across societal groups, which may exacerbate health inequalities rather than help resolve them.

Key enablers are likely to include growing, robust evidence base demonstrating the positive health impacts and cost-effectiveness of structural preventive health interventions. Existing collaborations between the national government, public health agencies, research institutes, municipalities, and civil society organisations will facilitate the implementation of these interventions and foster their legitimacy. The gradual integration of health considerations into urban planning, transport, digital governance, and fiscal policy will contribute to making healthy behaviours the easiest and most accessible choice.

7.3 Preventive health transition pathway III: Making preventive health planetary-centered

Main goal: In 2050, planetary health principles are at the core of preventive health in the Netherlands, with preventive health policies promoting human health, ecological sustainability, and resilience to environmental changes. Preventive health explicitly considers environmental determinants of health, acceptable levels of environmental and health risks, and the equitable distribution of protective interventions across people with different socio-economic status and based in different geographic areas. This pathway assumes an important shift from preventive health approaches focusing mainly on human health to integrated governance that addresses health and environmental objectives across relevant sectors (W, December 9, 2025; I3, 5, 10). Important transformations include the integration of planetary health considerations into preventive health policy, governance, and digital infrastructures; the widespread use of integrated environmental and health data for decision-making; strong collaborations between health, environmental, agricultural, educational, and spatial planning sectors; and a considerable shift in societal norms and values, positioning the wellbeing of other species as central to human health and wellbeing.

Phase I (experimentation and stabilisation): — Developing shared planetary-health goals. *Efforts focus on establishing the institutional, scientific, and political foundations needed to integrate planetary and preventive health. Universities and research institutes develop*

methods and evaluation frameworks that bring together environmental, health, and equity indicators.

Integrated frameworks enable policymakers to evaluate long-term impacts and trade-offs associated with preventive health investments. They also support the assessment of the unequal distribution of diverse environmental and health risks across societal groups and ensure collective reflection on the economic, ecological, and health implications of different policy choices. Preventive health policy entails planetary health objectives, such as the reduction of environmental exposures, of risks stemming from extreme heat, water scarcity, and flooding, and the use of plastics and other harmful materials in a broad range of products. Cross-sectoral dialogues, involving representatives of VWS, LVVN, OCW, RIVM, GGDs, universities, research institutes, and civil society organisations, contribute to the development of a shared vision, priority areas of intervention, and governance arrangements, thereby fostering legitimacy and the collection of evidence needed for the implementation of diverse measures.

Phase II (diffusion):— Building integrated systems and pilots. *Regional and local actors develop pilots combining environmental and health data. Education, public communication, and regulation strengthen awareness and action across human and planetary health. Insurance models begin to experiment with rewarding behaviours with positive environmental impact.*

National, regional, and local actors collaborate to develop integrated digital platforms combining environmental, climate, and health data for monitoring, risk prediction, and preventive health interventions assessments. Educational curricula, professional training programs, and public communication campaigns strengthen awareness of the interconnections between human and planetary health and facilitate the adoption of lifestyle measures with positive environmental impacts. Health insurers reimbursement models, which reward activities that generate both health and environmental benefits, such as active transport, community greening initiatives, and other sustainable lifestyle practices, are piloted. Cross-sectoral long-term cost-sharing mechanisms are experimented with, to incentivise investments in a context where many benefits will materialise only later. Collaborations between governments, research institutes, businesses, civil society organisations, and local communities facilitate the development, evaluation, adaptation, and scaling of innovative planetary health interventions.

Phase III (institutionalisation): — Institutionalising planetary-health governance. *Planetary-health indicators are embedded in governance, planning, and reporting. Digital systems support joint environmental and health decision-making, and the environmental footprint of these systems is actively monitored and managed.*

Planetary health outcomes become core performance indicators within municipal, regional, and national preventive health governance. Governance arrangements regulate data access, interoperability, predictive modelling, and decision-support systems, enabling policymakers,

municipalities, and public health organisations to routinely integrate environmental and health information into preventive health planning. Formal agreements establish minimum protection levels for environmental risks, such as heat, flooding, air pollution, and clearly define roles, responsibilities, and accountability mechanisms. Successful pilot initiatives are systematically scaled across the Netherlands with context-sensitive adaptations to ensure they effectively reduce health inequalities rather than reinforce them. The environmental footprint of digital preventive health infrastructures is continuously monitored and reduced through sustainable technological development**.** Integrated digital systems support adaptive governance by continuously monitoring environmental conditions, population health, health inequalities, and intervention outcomes.

Key barriers are likely to include fragmented governance and insufficient alignment between health, environmental, climate, and spatial panning policies; the limited availability of integrated planetary health indicators, and interoperable data infrastructures, as well as the substantial long-term investments needed for the latter's implementation and maintenance. At the same time, resistance among organisations and different types of professionals may lead to delays in the adoption of the new evaluation frameworks, technologies, standards. Such resistance is bound to be particularly high if financing, legitimacy and reputation are linked to how they perform along these new metrics.

Key enablers are likely to include the growing societal awareness of the strong interlinkages between planetary and human health and increasing political attention to climate adaptation and ecological sustainability. The already available interdisciplinary research network will facilitate the development of relevant new insights and integrated monitoring and assessment metrics. The development and widespread distribution of technological and institutional innovations facilitating cross-sectoral collaborations will further fuel the developments described above.

7.4. Preventive health transition pathway IV: Making preventive health investable

Main goal: In 2050, preventive health in the Netherlands is institutionalised as a long-term, societal investment system, promoting health, well-being, equity, and welfare, rather than functioning as a mechanism for healthcare costs reduction. Preventive health is embedded in stable, multi-annual public investment frameworks, and is evaluated based on its contributions to population health, healthy life expectancy, health equity, as well as productivity, educational outcomes, social participation, environmental sustainability. Important transformations include the replacement of the healthcare cost-saving rationale with an investment logic wherein preventive health is acknowledged as a public good that generates long-term social, economic, and environmental returns (W, November 25, 2025; I 12, 20); and the establishment of a National Preventive Health Authority, providing strategic leadership. These transformations contribute to more equitable, predictable, and strategically coordinated investments in preventive health, while stimulating large-scale investments in the structural determinants of health, such as education, housing, working conditions, environmental factors.

Phase I (experimentation & stabilisation): — Building institutional and financial foundations. *Efforts focus on establishing institutional, scientific, and political foundations for long-term preventive health investments*. *Governance structures are established. Economic evaluation methods are extended to capture the broader societal returns of prevention, drawing on emerging well-being and beyond-GDP frameworks. Dedicated preventive-health funding mechanisms are introduced.*

The National Preventive Health authority is established with the mandate of setting national preventive health objectives, coordinating implementation across governance levels, monitoring progress, and managing dedicated preventive-health investment funds. Cross-sector collaborations, especially between public health, education, social services, and infrastructure planning, are strengthened.

Phase II (diffusion): — Scaling cross-sector investments. *Joint investment models are developed between governments, insurers, employers, and communities. Preventive-health measures expand across workplaces, environments, and population programmes.*

National, regional, and local bodies expand preventive health measures across multiple domains, including reducing exposure to harmful substances, expanding screening programs, and promoting workplace health. A combination of structural interventions and fiscal measures increasingly target commercial determinants of health by helping reduce the availability and marketing of unhealthy products. At the same time, preventive health policies targeting individual behaviours are adjusted, to more reliably reflect the latest insights from behavioural sciences, and to more effectively address timing and cognitive biases that contribute to unhealthy behaviours. Community organisations facilitate coordinated investments across relevant sectors and ensure alignment between national health goals and local needs. Educational curricula are adapted to increase knowledge about health determinants and long-term benefits of preventive health measures.

Phase III (institutionalisation): — Institutionalising preventive-health investment systems. *Preventive health is embedded in long-term budgeting and governance, with outcome-based indicators — including healthy life expectancy, equity, and well-being — guiding decision-making. It is widely understood as a shared societal responsibility, supported by strong institutions and adequate funding*.

Preventive health investments are fully institutionalised within national governance frameworks. Stable and dedicated preventive health funds ensure the long-term continuity of preventive health measures and the development and maintenance of national monitoring infrastructures. Evaluating investments in preventive health based on their contribution to quality of live improvements, labour market participation, social inclusion, become the norm.

Key barriers are likely to include the current funding structure which is mainly oriented towards healthcare expenditures; the current fragmented governance approach, which will make it difficult to ensure long-term cross-sectoral preventive health investments; unequal distribution of resources across regions; and the short-term orientation of influential actors,

including politicians and commercial companies. At the same time, socio-economic disparities and differences in health preferences among citizens are likely to hamper the design and implementation of aligned preventive health policies.

Key enablers are likely to include the growing policy focus on preventive health measures; stronger institutional coordination across national, regional, and local levels; and improved methods for assessing the long-term returns of prevention. In addition, financial gains and profitability stemming from infrastructural works and more diverse preventive health products and services will also become apparent.

7.5 Commonalities and differences across the four transition pathways

Main commonalities

In what follows we briefly discuss three main commonalities among the preventive health transition pathways we developed.

First, all four pathways move beyond narrow behavioural and biomedical understandings of preventive health and approach health outcomes as being shaped by broader social, economic, commercial, and environmental determinants. Financial security, housing quality, education, environmental exposures, and commercial practices are treated as important drivers of health outcomes. This is in line with growing evidence that meaningful improvements in population health require interventions that address the structural conditions shaping health opportunities (WRR, 2019; RIVM, 2022; Gilmore et al., 2023).

Second, local governance approaches are seen as important engines of systemic change. All pathways position municipalities, GGDs, neighbourhoods, and communities as key sites for preventive health action, whether through participatory governance structures (Pathway I), the redesign of health-promoting environments (Pathway II), the co-development of planetary monitoring systems (Pathway III), or investment coordination mechanisms (Pathway IV). This does not mean that a stronger preventive health system requires decentralisation, but a carefully aligned multi-level governance arrangement capable of linking national direction-setting with regional coordination and local experimentation. This will make it possible to address complex preventive health challenges at national level in ways that remain sensitive to local needs and contexts.

Third, all pathways rely on the development and widespread implementation of digital technologies and data infrastructures and are thus aligned with current European Union and Dutch efforts to stimulate the development of health and environmental infrastructures. At the same time, however, they are also prey to the same legal and ethical complexities and dilemmas concerning privacy, accountability, health equity, and data sovereignty. Whereas in these four pathways, digital technologies and data infrastructures are depicted largely as enabling continuous monitoring, tailored interventions, adaptive governance, these positive

impacts will depend upon quality of the governance and accountability mechanisms shaping their use and deployment.

Main differences

Having highlighted some of the common elements across the four preventive health transition pathways we developed, we now sketch out several important differences by zooming on onto their normative orientation and underlying governance logic. Differences in norms and values tend to remain implicit, and as such they can fuel misalignment and misunderstandings.

Pathway I is grounded in a solidarity and equity logic, as it frames health as a public good and shared social responsibility. Participation and inclusive decision-making are at the heart of this pathway along with a strong emphasis on reducing structural inequalities and removing financial barriers to health. Yet, the re-appreciation of experiential and other types of knowledge it entails may lead to important controversies and epistemic challenges.

Pathway II focuses on environmental redesign as a means to stimulate healthy choices and behaviours, and foregrounds convenience, accessibility, and affordability. It thus aligns with reports indicating that the effectiveness of structural preventive health measures, such as fiscal policies, the regulation of unhealthy products, and urban design interventions that promote physical activity and healthy lifestyles (OECD, 2024; OECD, 2025).

Pathway III is largely based on ecological ethics and more-than-human approaches, as it extends the conceptualisation of health to include other species and positions environmental sustainability and ecological resilience as prerequisites for long-term population health. This pathway is in line with emerging efforts to align public health, climate, and environmental agendas. It also reflects a growing body of evidence indicating that climate change, biodiversity loss, pollution, environmental degradation are both major determinants of health outcomes and future health risk factors (Romanello et al., 2023; PECCH, 2026).

Pathway IV is based upon an economic investment logic, with preventive health framed as a long-term societal investment capable of generating returns in terms of productivity, participation, and welfare. It thus resonates with emerging arguments that sustainable health systems require a shift from disease management towards the development of societal resilience through long-term investments in prevention (Mierau & Demaria, 2026). It also aligns with growing concerns about the economic implications of ageing, chronic disease, and decreasing labour-force participation (CPB, 2025; OECD, 2025).

7.6 Possible hybridisation of preventive health transition pathways

Despite these important tensions, the four pathways we developed reveal significant opportunities for hybridisation. We suggest that a promising convergence points lies between

Pathways II and IV, as structural preventive health measures could be fruitfully embedded within long-term investment frameworks. Injecting Pathway IV with some of the participatory governance elements described in Pathway I would help diminish the risk of a technocratic, market-driven preventive health system and ensure that health equity is foregrounded. Pathway III broadens the temporal and ethical dimensions of preventive health by incorporating ecological constraints and intergenerational considerations. While the changes it puts forward are bound to give rise to strong resistance from different actors and at different levels, combining human and planetary health elements can help address 'anthropic shortsightedness' (Badouin, 2026). Highlighting this benefit may help increase the acceptability of the transformations described under this pathway and the uptake of some of them within other, more popular pathways. Overall, it is quite likely that the future Dutch preventive health system will combine elements of all four pathways rather than emerging through the concentration of efforts on only of them. What elements will be combined and how will be shaped by political priorities and societal developments.

8. Discussion and conclusions

In this White Paper, we approached the preventive health system as distinct from the curative one and explored how preventive health is currently governed and organised in the Netherlands and what transition pathways could support a shift towards a stronger preventive health system. Building upon Transition Studies perspectives, it answers the following research questions:

1. Which **dominant rules** structure how preventive health is governed and organised in the Netherlands?
2. What **niche innovations** are considered promising for systemic change in preventive health, and what opportunities and challenges (are likely to) shape their development and diffusion?
3. What **transition pathways** could support a systemic shift towards a stronger preventive health system in the Netherlands? More specifically, which institutional, technological, social, and governance changes would be required to realise a desirable future for preventive health in the Netherlands?

8.1. Overview of main findings

Current preventive health regime

Our analysis of the dominant rules shaping the current Dutch preventive health regime shows that the reduction of health risks through evidence-based interventions remains the dominant orientation across the five dimensions we researched, namely: Science and Technology, Business and Industry; Policy and Governance; Users and Markets; Culture. At

the same time, our findings suggest that there is a growing tendency to complement such interventions through novel approaches stemming from holistic understandings of health, where the combined impacts of biological, behavioural, social, environmental, and commercial determinants are acknowledged. Thus, real-world data, digital technologies and platforms, personalised interventions, diverse participatory arrangements, and healthier living environments are approached as means whereby individual and population health can be improved. These tendencies are fuelled by the activities of industry actors that seek to commodify, monetise, and personalise preventive health interventions. They are further reinforced by the pervasive expectation that individuals should assume responsibility for their own health, actively and discriminately consume health information, and engage in community-based interventions meant to promote health. Current policies and governance structures provide the framework for these approaches, as they incentivise practices and approaches meant to further population health, and seek to curtail, to varying degrees, unhealthy behaviours and commercial practices with negative health impacts.

Despite these common orientations across all five dimensions of the current Dutch preventive health regime, we also identified a number of emerging tensions. Thus, traditional hierarchies of evidence remain dominant, thereby hampering the diffusion and evaluation of increasingly important complex, and context-dependent preventive health interventions. At the same time, the governance of preventive health remains fragmented, which limits the funding, coordination, and development of cross-sectoral interventions, despite growing recognition that preventive health requires integrated approaches. Similarly, current investments in digital technologies likely to facilitate the collection and (re-)sharing of different types of data offer important opportunities for improving preventive health but require clear, standardised institutional and regulatory arrangements regarding data ownership, security, privacy, interoperability. Importantly, framings of health as individual responsibility are increasingly in tension with approaches that conceive of health as a shared social responsibility and promote solidarity and social cohesion. Overall, our findings indicate that although holistic, systems-oriented, and collaborative approaches are increasingly acknowledged, they coexist with institutional arrangements, market incentives, and governance structures that prioritise health risk reduction and individual behavioural change.

Promising niche innovations

Our analysis identified a broad range of promising niche innovations, including technological, institutional, governance, financial and market, and social types of innovations. Many of these innovations testify to ongoing efforts to go beyond biomedical understandings of health and traditional approaches to health risks, and to tackle social, environmental, and commercial determinants of health. Thus, many of the niche innovations discussed in this paper point not only to new preventive health practices and approaches, but also highlight the need to reconsider where, when and by whom preventive health interventions should be developed and deployed, based on what types of evidence, as well as the elements that should be reflected upon for their diffusion. The fact that many innovations focused on cross-sectoral

collaborations and relied on the active engagement of different types of actors suggests that there is growing awareness that addressing current pressing preventive health challenges requires coordinated efforts. Importantly, the participants in our study highlighted that transforming the current preventive health regime cannot be achieved by investing in the development and diffusion of only one type of innovation. Instead, they suggested that systemic change can be achieved by aligning different types of innovations and making institutional, regulatory, and normative adjustments needed to support them. Across all niche innovation categories, common challenges referred to fragmented governance, limited funding, different time cycles, regulatory complexity, data interoperability difficulties, unequal access to relevant resources, but also resistance to change and opposition from influential actors. Overall, our findings suggest that preventive health transitions need to be based upon well-aligned technological, institutional, governance, financial, and social innovations.

Four preventive health transition pathways

We used these insights to develop four preventive health transition pathways: *Making preventive health with all, for all*; *Making preventive health 'the easy choice'*; *Making preventive health planetary-centered*; and *Making preventive health investable*. The four preventive health transition pathways we introduced in the previous section can be understood as distinct, but partially overlapping possible futures. Each pathway articulates a different governance model and mechanism of change and is underpinned by different norms and values. What binds them together is the assumption that the challenges confronting the current preventive health system are too complex to be addressed through incremental adjustments alone. These pathways should not be understood as forecasts, but rather as alternative transition trajectories that illuminate different mechanisms through which systemic change may occur. As such, they are intended to support reflection and productive debate on how preventive health in the Netherlands may evolve under different combinations of societal values, institutional arrangements, and policy priorities.

It is important to mention that there are differences regarding the extent to which these pathways resonate with established policy directions and dominant societal views. The first two pathways align closely with main ambitions regarding preventive health in the Netherlands, as evidenced by policy documents and insights shared by our participants and interviewees. As such, they are likely to evoke a considerable degree of familiarity and recognition, although their implementation will still require substantial structural change. The final two pathways have a more exploratory and groundbreaking character. They were developed based on emerging debates and calls for action in the academic literature and policy documents and the future visions a minority of our participants articulated. Their inclusion reflects the awareness that long-term systemic change is fuelled at times by unusual perspectives, dissenting views, and intense discontent about an existing regime.

8.2. Limitations of this study

In this study, we developed four preventive health transition pathways for the Dutch preventive health system through the analysis of empirical materials, academic publications and policy reports, and based on our expertise and understanding of transitions and preventive health. While this approach is appropriate for exploring complex, uncertain, and long-term societal transitions, we need to highlight a number of limitations regarding the scope of the empirical material, the interpretative nature of the analysis, and the pathways development.

A first limitation concerns the empirical basis of our study and the included. The empirical data were collected through interviews and workshops with practitioners, policymakers, and experts who are already actively involved in preventive health or who work in adjacent policy domains where preventive health is increasingly relevant. This means that our dataset is likely skewed toward actors who are already aware of, or supportive of, preventive health transitions and who operate within institutional settings that recognise preventive health as a salient policy objective. The study therefore does not sufficiently capture perspectives from stakeholders who are less engaged with preventive health, who may not perceive it as a priority, or who may even question the necessity or feasibility of the structural changes we propose. It is therefore unclear to what extent the preventive health transition pathways put forward in this White Paper entail changes and transformations that actors whose primary mandates lie outside preventive health would support. This also means that we only have partial understanding of how different stakeholders assess the urgency of systemic change, especially when such change may conflict with existing institutional responsibilities, financial constraints, or operational priorities. The four pathways should therefore not be interpreted as reflecting a comprehensive or representative mapping of societal views on preventive health transformation. Instead, they reflect perspectives that are already relatively close to current preventive health agendas.

A second limitation relates to the methodological approach used to construct the transition pathways. The scenarios presented in this study were developed through an abductive and interpretative process that integrated empirical observations, existing academic and policy literature, and the professional expertise and normative judgments of the research team. This approach is consistent with Transition Studies methodologies that seek to explore futures under conditions of complexity and uncertainty, where using only inductive or predictive approaches is not feasible or recommendable (Geels, 2024). It is important to highlight, however, that this analytical approach involves a degree of interpretative construction, where our disciplinary backgrounds, analytical priorities, and normative orientations played a role. Whereas we sought to ensure that the four pathways we developed are well grounded in existing evidence and are plausible within the current Dutch policy context, they constitute analytically constructed futures that highlight certain dynamics while necessarily excluding or simplifying others. This is particularly relevant for Pathways III and IV, which were initially informed by emerging debates and niche developments. However, subsequent policy and

scientific developments suggest that the transformations they describe are highly adequate. Thus, the developments in Pathway III are supported by the growing integration of health, climate, and environmental governance reflected in the Planetary Health and One Health agendas, the Lancet Countdown on Health and Climate Change (Romanello et al., 2023), the Pan-European Commission on Climate and Health Call to Action (PECCH, 2026), and Dutch and European initiatives promoting cross-sectoral approaches to environmental and health risks. Similarly, pathway IV is supported by a growing body of work arguing that prevention should be understood as a long-term societal investment rather than solely as a mechanism for reducing healthcare expenditure. Recent efforts by RIVM to develop structured frameworks for assessing investments in preventive health, together with broader debates on sustainable healthcare financing, resilience, and the economic consequences of population ageing and chronic disease, point towards increasing institutional interest in preventive health-oriented investment approaches (CPB, 2025; Mierau & Demaria, 2026).

8.3 Conclusion

The findings presented in this White Paper suggest that there is broad awareness that the changes with which the current preventive health regime is confronted in the Netherlands cannot be addressed through incremental improvements alone. Rather, they call for a transition towards a preventive health future that is more effective, just, inclusive and empathetic. Such a transition cannot be achieved through the identification of a single promising innovation, and by broadening the network of supportive actors around it, and facilitating collective learning. Instead, its success will depend on aligning technological, institutional, regulatory, financial, and social innovations, while fostering collaboration across sectors, academic disciplines, and societal groups and communities. It will also depend on the willingness and ability of different actors to engage with different perspectives, develop a richer , multi-dimensional understanding of the complexity of preventive health challenges, and collectively work towards a more desirable preventive health future. This also requires broadening our understanding of who participates in and who benefits from the preventive health transition. Building bridges between governmental bodies and agencies, researchers, public health experts, healthcare professionals, community, and commercial actors will be essential for designing health-promoting environments and approaches. Ideally, such a transition would entail yet another kind of expansion, to include, next to the hopes and concerns of different types of groups and individuals, also concerns for other species and the planet.

The preventive health transition pathways provided in this White Paper are therefore an invitation to dialogue and debate across differences and divides, to make underlying values, norms, assumptions, and trade-offs explicit, and to build shared directions for systemic

change. By sufficiently peering together with many diverse sets of eyes upon the current preventive health challenges, we can find the solutions hidden within.

References

Baccarelli, A., Dolinoy, C., & Walker, C. (2023). A precision environmental health approach to prevention of human disease. *Nature communications*, *14*(1), 2449.

Baudoin, L. (2026). The Problem Is Not Anthropocentrism, It's Anthropic Shortsightedness. *Business & Society*, 00076503251408588.

Boon, W., Moors, E., Meijer, A. (2014). "Exploring dynamics and strategies of niche protection". *Research Policy*, 43 (4): 792-803.

Broeder, L., Hilderink, H., Polder, J., et al. (2024). *Kiezen voor een gezonde toekomst: Hoofdrapport Volksgezondheid Toekomst Verkenning 2024* (RIVM-rapport 2024-0110). Rijksinstituut voor Volksgezondheid en Milieu.

Centraal Bureau voor de Statistiek. (2025). *Leefstijl en sociaaleconomische status*. Statistische Trends.

Dolley, S. (2018). Big data's role in precision public health. *Frontiers in public health*, *6*, 68.

Geels, F. W. (2024). Multi-level perspective on sustainability transitions. *In Handbook of Sustainability Transitions*. Edward Elgar.

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental innovation and societal transitions*, *1*(1), 24-40.

Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case study. *Research Policy, 31*(8–9), 1257–1274.

Geels, F. W., Kern, F., et al. (2016). The enactment of socio-technical transition pathways. Research Policy, 45(4):

Gilmore, A. , Fabbri, A., Baum, F., et al. (2023). Defining and conceptualising the commercial determinants of health. The Lancet, 401(10383), 1194–1213.

Kanger, L., Johnstone, P., Genç, J. N., Wojtynia, N., Ghosh, B., Steinmueller, W. E., & Schot, J. (2024). *Regimes and meta-regimes: Maps for 5 systems and 3 surges* (Deep Transitions Lab Working Paper). Deep Transitions Lab, Utrecht University.

Lakerveld, J., Woods, C., Hebestreit, A., Brenner, H., Flechtner-Mors, M., Harrington, J. M., ... & Ahrens, W. (2020). Advancing the evidence base for public policies impacting on dietary behaviour, physical activity and sedentary behaviour in Europe: the Policy Evaluation Network promoting a multidisciplinary approach. *Food Policy*, *96*, 101873.

Van Meeteren, N., Van Megchelen, P., Mierau, J., et al. (2022). *Preventie: Het andere verhaal*. Coincide. https://coincide.nl/online-magazine/nummer-23-artikel-16/

Myers, S. (2017). Planetary health: protecting human health on a rapidly changing planet. *The Lancet*, *390*(10114), 2860-2868.

Mierau, J., Demaria, M. (2026). Public health in the age of longevity interventions: from prevention to system-wide resilience. *Aging*, 18: 572-574.

Ministerie van Volksgezondheid, Welzijn en Sport (VWS). (2018). *Nationaal Preventieakkoord*. Ministerie van Volksgezondheid, Welzijn en Sport.

Ministerie van Volksgezondheid, Welzijn en Sport. (2025, June). *Samenhangende preventiestrategie*. https://open.overheid.nl/documenten/ef6874c0-73ee-45c8-a117-e909d141ff57/file

OECD (2024). Health at a Glance: Europe 2024. OECD Publishing.

OECD (2025). Health at a Glance 2025: OECD Indicators. OECD Publishing.

Quist, J. (2007). *Backcasting for a sustainable future: the impact after 10 years*. Eburon Uitgeverij BV.

Quist, J., Thissen, W., Vergragt, P. J. (2011). The impact and spin-off of participatory backcasting: From vision to niche. *Technological Forecasting and Social Change, 78*(5), 883–897. https://doi.org/10.1016/j.techfore.2011.01.011

Pan-European Commission on Climate and Health (PECCH) (2026). Call to Action. World Health Organization Regional Office for Europe.

Raven, R. (2026). Strategic niche management: past, present and future. In *Introduction to Sustainability Transitions Research* (pp. 83-107). Cambridge University Press.

Rijksinstituut voor Volksgezondheid en Milieu (RIVM). (2024). *Volksgezondheid Toekomst Verkenning 2024: Kiezen voor een gezonde toekomst*. Rijksinstituut voor Volksgezondheid en Milieu

Rockström, J., Thilsted, S., Willett, W., Gordon, L., Herrero, M., Hicks, C., ... & DeClerck, F. (2025). The EAT–Lancet Commission on healthy, sustainable, and just food systems. *The Lancet*, *406*(10512), 1625-1700.

Romanello, M., et al. (2023). The 2023 report of the Lancet Countdown on health and climate change. The Lancet, 402(10419), 2346–2394.

Ter Ellen, F., Oude Groeniger, J., Stronks, K., Hagenaars, L. L., Kamphuis, C. B., Mackenbach, J. D., ... & van Lenthe, F. J. (2025). Understanding the dynamics driving obesity in socioeconomically deprived urban neighbourhoods: an expert-based systems map. *BMC medicine*, *23*(1), 2.

Voß, J. P., Smith, A., & Grin, J. (2009). Designing long-term policy: rethinking transition management. *Policy sciences*, *42*(4), 275-302.

Vermeulen, R., Schymanski, E. L., Barabási, A. L., & Miller, G. W. (2020). The exposome and health: Where chemistry meets biology. *Science*, *367*(6476), 392-396.

World Health Organization. (WHO). (2023). *Achieving well-being: A global framework for integrating well-being into public health utilizing a health promotion approach*. World Health Organization. https://www.who.int/publications/i/item/9789240084858

WRR (2018). Van verschil naar potentieel. Wetenschappelijke Raad voor het Regeringsbeleid.