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## The SPIMEU project: Implementation of selective chronic-disease prevention programs in your country: Barriers and facilitators

### *Cardiometabolic disease in Europe*

The steady rise in cardio-metabolic disease (CMD; cardiovascular disease, diabetes mellitus, chronic kidney disease) poses a major public health issue in most developed countries. Globally, 422 million people are currently diagnosed with diabetes mellitus [1]. This constitutes a nearly 400% increase since 1980. Further, cardiovascular disease (CVD) is currently the most common cause of mortality, accounting for 29.6% of all deaths (15.6 million deaths) worldwide [2]. These numbers are staggering – especially when considering that CMDs are often preventable. That is, while more fixed factors, such as low socio-economic status or a family history of poor health certainly contribute to the likelihood of developing a CMD, other equally significant precursors relate to maladaptive, yet changeable health behaviors. These include most importantly smoking, diet, and/or leading a sedentary lifestyle. Considering the persistent increase in each of these three key risk factors, rates of CMD will in all likelihood only continue to escalate [3-5]. In order to resolve this predicament, there is a clear and present need for early detection and intervention against the development of CMD.

### *CMD-prevention*

Past research suggests that universal prevention strategies (e.g. legislation targeting unhealthy behavior) alone are insufficient to effectively control increasing CMD rates [6]. Indeed, selective prevention initiatives (SPIs), where the high-risk population is identified and intervened with is often considered crucial in preventive strategies, as early detection of, and intervention in the high-risk population has been shown to provide a significant window of time for lifestyle changes [7]. However, implementing effective CMD SPIs is often complicated by the inherent difficulty of accurately and reliably identifying the high-risk population. While potential solutions to this problem have been tested in individual countries, it is unclear how or if SPIs developed for one national health care system can be adapted to another.

### *The SPIMEU project*

The SPIMEU project focuses on the need for early detection and intervention against the development of CMD across the EU. Taking into account the considerable variation in EU member states' health care systems (specifically in terms of quality, extensiveness, and organization), we focused on how best to mobilize and implement effective SPIs in the EU at large. The main objectives related to establishing the feasibility of implementing CMD SPIs in five different national health care systems – in the Netherlands, Greece, the Czech Republic, Sweden, and Denmark. In order to do this, we designed five work packages (WPs) focusing on various feasibility aspects of selective prevention in terms of intervention design, implementation, and effectiveness. In particular, we examined the practical and structural organization of past and current SPIs in Europe (WP4). We then investigated the barriers and facilitators of patient and GP attitudes to selective prevention of CMD (WP5 & 6). In WP 7 and 8, we developed and tested the feasibility of a generic CMD SPI in the five partner countries. Based on our empirical results from these WPs as well as on the broader literature, we created a “toolbox” of sorts, containing evidence-based tools and “do’s and don’ts” for tailoring future SPIs to various national settings in the EU. In the following sections, we provide a brief summary of the SPIMEU project organization, methodology, findings, and outcomes.

### *Project organization and method*

The SPIMEU project comprised five empirical WPs, designed to investigate different aspects of selective Prevention methodology and implementation. In Table 1, we have outlined each of these WPs in terms of their aim and method.

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Table 1 Work packages 4-8\*

WP	Aim	Method (N)	Results
4	Identification and evaluation of SPIs implemented in the EU.	Survey (28 key persons, 66 experts).	Characteristics and assessment of 27 CMD SPIs implemented in the EU.
5	Evaluation of common barriers/facilitators of uptake and compliance with SPIs in European primary care systems.	Systematic Review (39 articles)	A synthesis of the evidence on barriers/facilitators into four categories: Structural, organizational, professional, and social (appendix II).
6	Assessment of GP and patient attitudes towards selective prevention in the five partner countries.	Surveys (575 GPs, 1354 patients)	Overview of attitude and opinions of a multi-national population of GPs and patients (appendix III).
7	Development of practical, step-wise implementation method for SPIs.	RAND/UCLA appropriateness method** (14 experts)	A set of 31 recommendations for implementation (appendix IV).
8	Development and implementation of a patient identification and recruitment method based on results from preceding WPs.	Feasibility study	Feasibility assessment of selective prevention implementation methods in five EU countries (appendix V).

\* WPs 1-3 related to project coordination, steering committee tasks, and dissemination of the results. As such, they are not included in the table. \*\* A validated method to synthesize the evidence and expert opinion on a given topic.

## Empirical results

### Work package 4 – Characteristics of current European SPIs

In WP4 we conducted a study into the characteristics and organizational aspects of SPIs in the EU. To this end, we identified 19 SPIs that are currently implemented in 16 EU countries.

#### WP4 Results

Among the 19 identified SPIs, several common denominators stood out. In terms of structure, the majority of SPIs focused on people between the age of 40 and 55. The initiative typically included a combination of questionnaires, laboratory tests, physical examinations, treatment, and follow-up. In terms of setting, the identified SPIs were often implemented in countries with strong primary care sectors. Further, most of the identified initiatives were designed and implemented by two or three key stakeholders, typically including primary health care providers, public health organizations, and/or policy makers. The funding that sustained these programs, came often from a variety of sources (though this information was only available for a third of the identified programs).

### Work package 5 – Patient and GP uptake of SPIs: Barriers and facilitators

In WP5, we focused on identifying common barriers and facilitators of patient and GP uptake of, and compliance with SPIs in European primary care systems. We conducted two systematic literature reviews into the barriers and facilitators as they related to GPs and patients.

#### WP5 Results

We structured the results of our review as they relate to GPs into five categories (Table 2).

Table 2 Most significant facilitators and barriers to selective preventive action: GPs

Context	Barriers	Facilitators
<b>Structural</b>	Lack of time/extra workload.	Availability of remuneration/resources.
	Lack of remuneration/resources.	Availability of adequate follow-up/referral.
	Lack of/unclear guidelines.	Availability of time.
<b>Organizational</b>	General organizational problems.	Availability of evidence-based and applicable guidelines.
	Lack of IT-support.	Flexible type of counselling.
	Communication problems.	Availability of IT-support.
	Lack of support/coaching services.	Collaboration with municipal/allied health care.
<b>Professional</b>	Lack of skills to communicate risk information.	Availability of logistic and practical support.
	Lack of knowledge.	Availability of adequate training and education.
<b>Social</b>	Negative patient reactions to program.	Positive and strong GP-patient relationship.
		Positive patient reactions to program (adherence to program).
<b>GP attitudes</b>	Doubts about benefits/efficacy of program.	Belief that preventive efforts as important.
	Opposition to prevention in general.	Belief that preventive efforts are central to GP.
	Lack of interest/motivation.	Positive attitudes to prevention in general
	Fear of negative patient effects.	Belief that it is possible to motivate lifestyle change.

In total 28 studies were included in the review.

In the review of barriers and facilitators as they relate to patients, we similarly organized the evidence into three distinct categories (Table 3):

*Table 3 Most significant facilitators and barriers to selective preventive action: Patients*

Context	Barriers	Facilitators
<b>Characteristics</b>	SES	SES
	Younger age	Older age
	Smoker	Non-smoker
	Single/unmarried	Receiving medical care
	Parent/guardian for child <5	Married/cohabiting
	Being retired	No children/dependents
		Social support
<b>Attitudes</b>	No desire to know CMD risk	Desire to know CMD risk
	Worry about health check outcome	Desire for reassurance
	Feeling unable to influence own health	No fear of health check outcome
	Feeling healthy	Feeling of responsibility for own health
	Feeling less susceptible to disease	Placing importance on own health
	Perceiving less severity of disease	Feeling able to influence own health
	Negative attitude towards prevention	Feeling concerned about own health
		Experiencing symptoms
		Positive attitude towards prevention
<b>Practical reasons</b>	Clear information about health check	Not being invited to health check
	Invitation from GP or health center	No familiarity with health check
	Follow-up contact after invitation	Lack of time
	Contact by outreach workers	Difficulty making appointment (e.g. no convenient timeslots)
	Working flexible hours	
	Easy access to health checks	

In total, 39 studies were included in the review.

#### *Work package 6 – Patient and GP attitudes towards SPIs*

On the basis of the results generated in WP5, we conducted two studies. In Study 1, we surveyed 575 GPs, recruited evenly across the primary care sectors in the five SPIMEU countries. The survey focused on GP demographics and attitudes towards CMD prevention. The central aim providing an up-to-date overview of the current practice of, and GP attitudes towards, selective prevention of CMD in primary care. In Study 2, we aimed to complement the findings from Study 1 by investigating the willingness of patients to participate in preventive CMD-health check.

#### WP 6 Results

We found that most GPs perceived selective prevention as a useful tool to combat the spread of CMD. However, our results also showed that less than half of participating GPs actually employed selective prevention measures regularly, and less than a quarter had implemented a protocol to this end. In other words, there was a clear discrepancy between GPs' attitudes to selective prevention of CMD and their actions. This may be due to various practical barriers, such as those identified in WP5.

The results from Study 2 suggested broad patient support for preventive care in general practice and willingness to participate in health checks of this nature. Nonetheless, certain subgroups of the participant population were less likely to attend a health check, and several of these groups represented people who most certainly would benefit from a health check (e.g. smokers, overweight people).

Taken together these results were on one hand encouraging as they indicate broad endorsement of selective prevention from both GP and patient populations. However, our results also highlighted factors that appear to inhibit the practice of selective prevention as well as its positive reception by patients. For example, in spite of majority patient support for selective CMD prevention, some of the most at-risk populations (e.g. smokers) were also among the least willing to attend a health check. This suggests the need for interventions that perhaps target on hard-to-reach populations. Similarly, while GPs in general agreed with the utility of selective prevention, there was also a basic lack of facilities, organization (e.g. guidelines/protocols), knowledge, time, etc. that in many cases foiled their motivation, opportunity, and/or ability, to provide systematic and continuous preventive care. In line with the results from WP5, this

suggests the need for special attention to be directed to the logistics and organization of clinics, and for CMD programs to be tailored to specific settings.

#### *Work package 7 – The development of a generic CMD SPI for European primary care: Consensus meeting*

In work packages 5 and 6 we reviewed past findings on the barriers and facilitators of selective CMD-prevention efforts. Through empirical study, we also generated new evidence on this topic, significantly advancing our understanding of the specific organizational, professional, and interpersonal conditions that should be met for optimal intervention feasibility and success. On the basis of this knowledge, WP7 focused on the more concrete development of a generic selective CMD-prevention program for European primary care. To this end, we employed the Rand/UCLA Appropriateness Method (RAM) [8]. At its core, this method represents an efficient way to reach formal agreement on how the best available evidence from a given scientific field should be interpreted and applied with maximum efficacy and value in the ‘real world’.

#### WP7 Results

We invited 14 experts in the field to discuss a set of 32 statements on what should be considered when designing and implementing CMD SPIs. The proposed recommendations had been developed by the SPIMEU team. After two days of constructive discussion and two rounds of voting, the expert panel returned a list of 31 statements of which they had achieved consensus on 28. In sum, the results of the consensus meeting indicated that our international, and academically diverse sample of leading experts in the field of CMD and lifestyle-related disease, agreed on most issues relating to program scope and development, organization and funding, target population identification methods, and the notion of embedding programs in primary care. Fundamentally, the panel conceded that here is a need for selective CMD-prevention programs in Europe, and that such programs should be developed by experts in the field, tailored to and piloted in local settings, and mandated and financed by government.

The findings from WP7 thus complement those from WP4, WP5, and WP6. Indeed, taken together, these four work packages provide a more complete, state-of-the-art understanding of the current practice of selective CMD prevention in Europe, GP and patient perception and use of such efforts, and expert assessments of the most important systemic and methodological factors that should be addressed in any large-scale prevention program. As such, these findings directly informed the final WP of the SPIMEU project, which centered on the development and feasibility of a generic CMD-prevention program.

#### *Work package 8 - The development of a generic CMD SPI for European primary care: Feasibility study*

In WP8 we designed a generic CMD SPI based on the results from the preceding WPs, and tested the feasibility of the program in each of the five SPIMEU partner countries. The implementation involved a three-step process of target-population identification (risk assessment), patient invitation, and a GP health check. While uniform in terms of purpose and sequence across the partner countries, each of these steps was tailored to fit with local organizational settings to maximize feasibility and effectiveness (Table 4). We gauged feasibility by five outcome variables. These related to (1) patient uptake of the SPI, (2) patient completion of the SPI, (3) patient attitudes towards the SPI and their CMD risk, (4) GP attitudes towards the SPI, and (5) GP assessment of the implementation of the SPI.

*Table 4 – Core and tailored implementation method.*

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#### **Core implementation (obligatory steps for all SPIMEU countries)**

1. 200 eligible patients were invited to participate in each country.
2. All participants completed a validated risk assessment tool.
3. Patients at high risk were invited to get a health check from a GP.

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#### **Tailored implementation (components that may differ between SPIMEU countries)**

1. Size and number of participating general practices.
  2. Method of approaching eligible patients for participation.
  3. Age range of eligible persons may vary, but must include 40-65-year-olds.
  4. Selection of a validated risk assessment tool.
  5. Method of communication with participants (face-to-face, telephone, GP or practice nurse, etc.).
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## WP8 Results

In terms of patient uptake and completion rates, our results indicated considerable between-country variation. Patient uptake ranged from 19.5% in Sweden to 100% in the Czech Republic. While participant risk assessment completion rate also fluctuated somewhat between countries, the margins here were tighter, ranging from 65.4% in Greece to 100% in Sweden. On the other hand, patient attitudes towards the SPI and lifestyle change were consistently positive, with a clear majority of participants indicating that the SPI was relevant and useful to them, and that it had inspired lifestyle changes.

In relation to the amount of time and effort required of GPs for identification and invitation of the at-risk population, there were considerable differences between and within countries. In the Czech Republic, for instance, ten GPs participated in the study. Some of these reported that it took minutes to identify the at-risk population, while others said that it took a few hours, and others indicated that the process took several days to complete. Similarly, in Greece, the three participating GPs reported quite different timeframes for this process, ranging from minutes to days. In Sweden and Denmark, identifying and inviting patients took two days. The variation between and within countries on these factors is likely to do with the different methods of patient-data extraction that were employed. For example, in Denmark GPs took a proactive approach and used the study eligibility requirements (age, pre-existing conditions, etc.) to search their patient databases. By contrast, one of the Greek GPs invited patients opportunistically when they showed up in the clinic for an appointment. This method required about five minutes of eligibility screening per patient.

GPs also reported on various barriers to the implementation of the SPI. These included lack of time and/or remuneration, discrepancies in the SPI protocol, lack of support from government, and staff shortages. These barriers were mainly relevant in the Czech Republic and Greece, but resonated with the results from WP5 and WP6. The WP8 results directly fed into the final deliverable of the SPIMEU project – a toolbox for implementation of SPIs in primary care.

### The SPIMEU toolbox

In the preceding sections, we have outlined the main components of the SPIMEU project's five empirical WPs. In sum, we compared and contrasted existing CMD SPIs in the EU in terms of design, organization, and implementation (WP4). We reviewed the barriers and facilitators that may impact on patient and practitioner uptake of SPIs, including patient and GP attitudes and preferences about SPIs (WP5 & WP6). In WP7 we drew on the collective expertise, experience, and knowledge of a group of European leading experts in public health and CMD prevention to develop a set of recommendations for the optimal design and implementation of SPIs. We then followed this up by testing the feasibility of an evidence-based, generic SPI in five different health care systems in five European countries. The results gleaned from these WPs has advanced our understanding of how SPIs might best be designed and implemented. As the final outcome of the SPIMEU project, we have taken this knowledge and organized it into a toolbox of sorts – a set of 12 evidence-based practical recommendations for health care professionals and policy makers interested in applying effective SPIs in primary care. The tools are divided into four main categories: (1) Funding and stakeholders, (2) Risk assessment and target population identification, (3) Health professionals – recruitment and engagement, and (4) Patients – recruitment and engagement. The general recommendations are presented in Table 5. In the actual toolbox document, each recommendation is supplemented with specific and concrete evidence-based suggestions as to how exactly one might realize these recommendations across different cultural, political, and systemic settings in the 'real world'.

Table 5 – The SPIMEU toolbox

Category	Issue
Funding & stakeholders	1.1 To the furthest extent possible, all central stakeholders (e.g. policy makers, health care professionals) should be involved in the design and implementation process of SPIs.
	1.2 To maximize success and effect of SPIs, funding of the initiatives should be sustainable over time.
Risk assessment & target	2.1 In order to facilitate accurate and efficient identification of the high-risk population,

<b>population identification</b>	<p><i>the definition of this population should be clear and concise, and take into account age and pre-existing conditions.</i></p> <p>2.2 <i>For optimum accuracy and validity, locally validated risk-assessment tools will likely yield the best results in terms identifying the target population.</i></p>
<b>Health professionals – recruitment and engagement</b>	<p>3.1 <i>The initiative should accommodate health professionals’ existing workload and time constraints.</i></p> <p>3.2 <i>A clear, evidence-based protocol for the implementation of the initiative should be made available to all participating health professionals.</i></p> <p>3.3 <i>If needed, education in selective prevention and training in the specific initiative protocol should be made available to health professionals and their staff.</i></p>
<b>Patients – recruitment and engagement</b>	<p>4.1 <i>Patient apprehensions related to potential health-check outcomes, should be anticipated and assuaged pre-implementation.</i></p> <p>4.2 <i>Patients’ feelings of powerlessness to affect their own health should be anticipated and counteracted before and during implementation.</i></p> <p>4.3 <i>Lack of patient knowledge in terms of the causes of and susceptibility to CMD, as well as its potential severity, should also be anticipated and counteracted pre-implementation.</i></p> <p>4.4 <i>Patients’ potential time constraints (work/family, etc.) and/or other practical obstacles (geography, financial, etc.) may impact on their likelihood of showing up for a health check and should be accommodated to the furthest extent possible throughout implementation.</i></p> <p>4.5 <i>Method of invitation to participate in the SPI should be evidence-based and optimally consist of an invitation from the patient’s GP, supplemented with information on the purpose and nature of a health check.</i></p>

## Conclusion

The SPIMEU project set out to advance the current knowledge on the optimal design and implementation of SPIs targeting CMD. To this end, we focused on the mechanisms that may underpin the effectiveness of SPIs (e.g. barriers and facilitators of GP and patient uptake) as well as the specific method (e.g. high-risk population identification) and feasibility of SPI implementation in various EU countries. Through this rigorous and comprehensive process, we have been able to identify a range of factors and issues that should be taken into account when designing and implementing an SPI in primary care. These results have ultimately contributed to the conception of a toolbox, which we hope will serve as both inspiration and practical guidance for the successful and comprehensive implementation of future CMD SPIs.

The **SPIMEU** project is a Trans-European research project conducted in a collaboration between the following research institutions:

NIVEL: Netherlands Institute for Health Services Research, The Netherlands  
Julius Center for Health Sciences and Primary Care, University Utrecht, The Netherlands  
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