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The health of European citizens:
What does the future have in store?

A FRESHER look at trends and scenarios



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Foresight and Modelling for European Health Policy and Regulation

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The health of European citizens: What does the future have in store?

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In the coming decades, European countries will face the major challenge of an increasing burden of chronic diseases (NCDs). This burden will cripple the European workforce, productivity and welfare systems. The FRESHER project has evaluated the potential impact of four prospective scenarios at the horizon 2050 based on alternative hypotheses for how major societal trends may fuel, or mitigate, a further spread of chronic diseases, and has produced quantitative forecasts of these trends and the possible impacts policies may have on them. Disease rates may increase by up to a third relative to current levels, and health expenditures may increase by one fourth. A consistent implementation and scaling up of established public health policy approaches would lead to significant improvements in the health of the European population. However, those policies alone can, at best, bend the increasing trend of chronic diseases. Addressing the challenge of chronic diseases in Europe requires more radical and innovative solutions, only some of which may be in sight today. It would also imply putting the fight against NCDs at the core of the whole international agenda in the framework of the achievement of the 17 Sustainable Development Goals adopted by the United Nations for the 2015-30 period.

The FRESHER project: a unique exercise in the field of health

FRESHER (“FoResight and Modelling for European Health policy and Regulation”) is an interdisciplinary research project funded by the European Union’s Horizon 2020 research and innovation programme under grant agreement No 643576 for a duration of 36 months (2015-2018). The overall project objective of the FRESHER project is the representation of alternative futures where the detection of emerging health scenarios is used to test future research policies to effectively tackle the burden of non-communicable diseases (NCDs). The FRESHER project aims to identify alternative future health scenarios for Europe, taking into account structural long-term trends in demography, gender relations, technological, economic, environmental, and societal factors up to 2050. To our knowledge, FRESHER is the first European research project combining qualitative foresight and quantitative forecast approaches, including the assessment of major societal trends and computer simulations of their long-term outcomes.

The FRESHER consortium has brought together the following research groups, including leaders in the management of large European Foresight projects and highly experienced health policy modellers, in an interdisciplinary team: Austrian Institute of Technology (AIT) – Austria; Aix Marseille University (AMU) – France; Institut National de la Santé de la Recherche Médicale (INSERM) – France; National Institute for Health and Welfare (THL) – Finland; Organisation for Economic Co-operation and Development (OECD); European



Public Health Alliance (EPHA) – Belgium; Fourth View Consulting (FVC) – Estonia; Imperial College London (ICL) – United Kingdom; Institute for Studies for the Integration of Systems (ISINNOVA) – Italy; Istituto Superiore di Sanità (ISS) – Italy; Silesian Center for Heart Diseases (SCCS) – Poland.

The FRESHER project has conducted part of its activities in collaboration with the project EURO-HEALTHY (led by University of Coimbra in Portugal), which aims to increase knowledge and resources on policies that have the potential to promote health and health equity across European regions with a focus on metropolitan areas.

The FRESHER project has generated forecasts for three European sub-regions based on four foresight scenarios: Southern Europe (including Croatia, Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia and Spain), Central/Eastern Europe (Bulgaria, Poland, Romania, Slovakia, Estonia, Hungary, Latvia and Lithuania), and Northern Europe (Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Ireland, Luxembourg, the Netherlands, Sweden and United Kingdom). A complete set of results are available on-line here. <http://www.fresher-explorer.eu/>

The microsimulation model (based on new developments of the current OECD model in this field) is also designed to assess the impacts of future policies. Sets of public health policies aimed at tackling smoking, harmful alcohol use and obesity were assessed as part of the project to determine their effects on chronic diseases, life expectancy and health care expenditure.

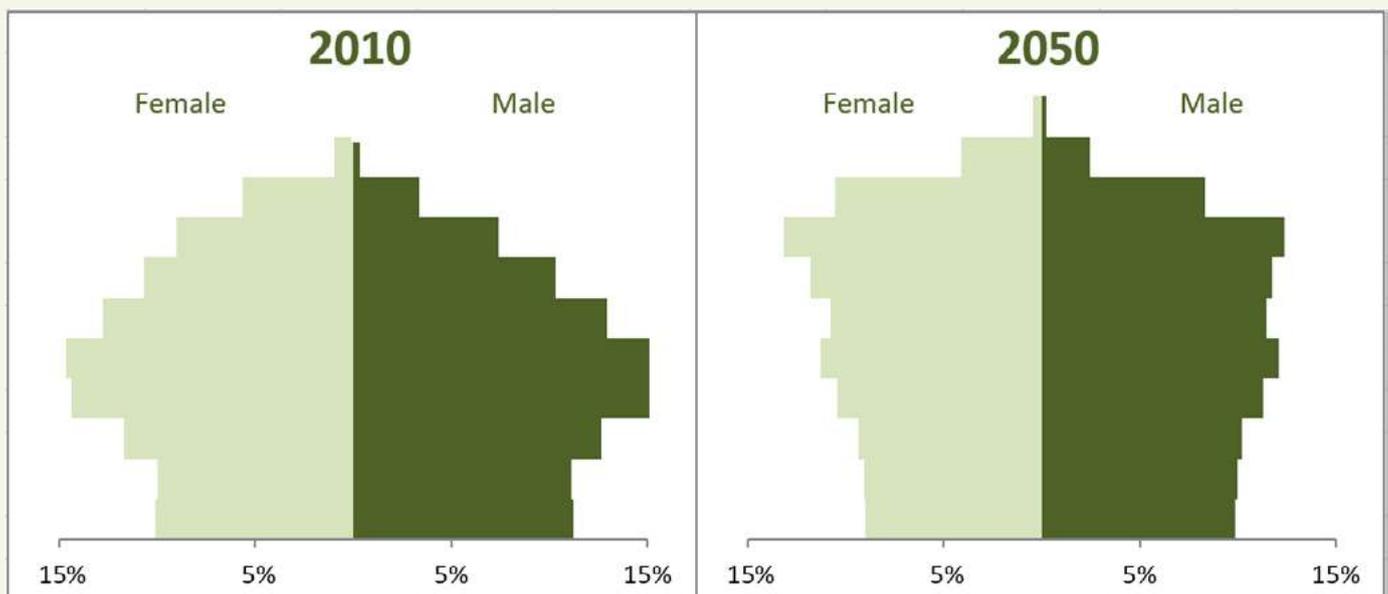


Europeans will live longer, but with more chronic diseases

Europeans are projected to live longer than today in 2050. Women’s life expectancy at birth is geared to rise from 83.1 to 87.5 years in 2050, and men’s from 77.9 to 83.3 years, based on the United Nations’ demographic forecasts. The age pyramid of the European population will gradually turn upside down (Figure 1). The share of the European population above 65 years of age will increase from 18% in 2015 to 30% in 2050, and from 16% to 30% in Southern Europe where population ageing will have the strongest impacts.

Figure 1. Age pyramids, Europe, 2010 and 2050

Source: Analysis based on a new model developed by OECD for the FRESHER project, 2017



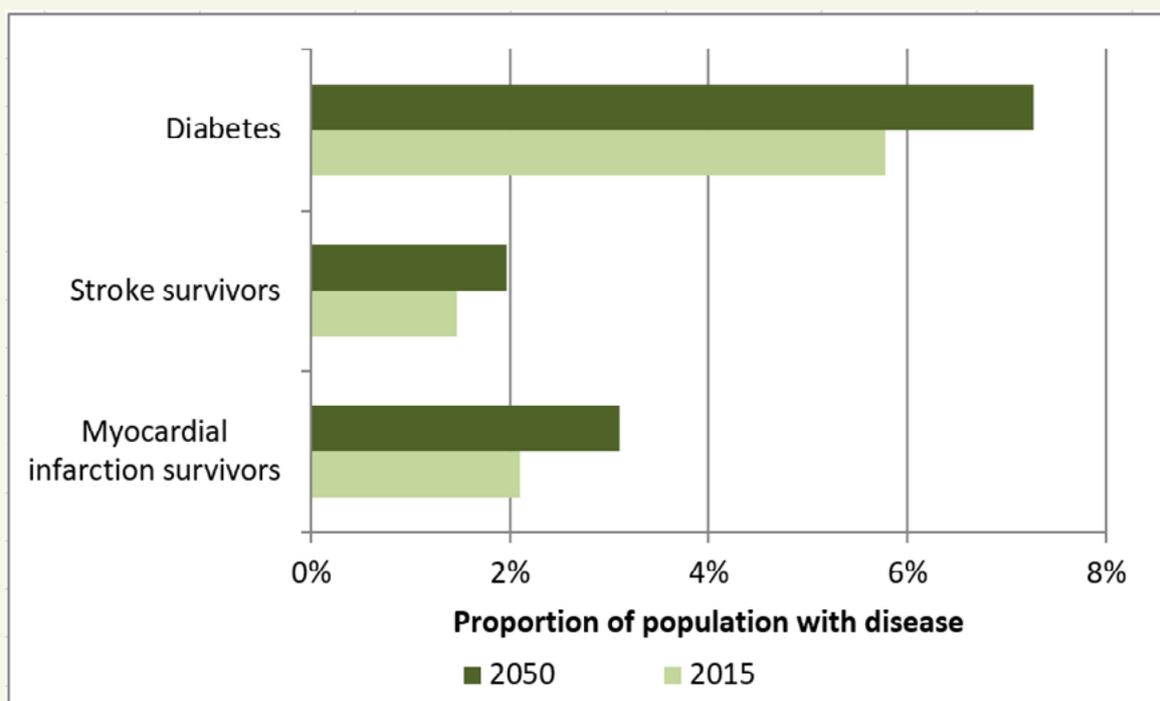
Using a computer simulation approach, the FRESHER project has explored the impact of current demographic projections on the spread of chronic diseases in the European population, and their impact on health systems and health expenditure, if we do not change the risk factors and the probability of developing chronic diseases which women and men of different ages have today in Europe.

As people live longer, and as the elderly become an increasingly large proportion of the European population, the number of people living with chronic diseases such as diabetes, ischemic heart disease (IHD), stroke, cancers, chronic obstructive pulmonary disease (COPD), mental illnesses, and muscular-skeletal disorders will increase. The prevalence of diabetes in adults will increase from 6% in 2015 to 7% in 2050, as shown in Figure 2 (from 6% to 7% in Southern Europe; from 5% to 7% in Northern Europe, and from 5% to 8% in Eastern-Central Europe).

An ageing population and a significant rise in chronic non-communicable diseases will place an immense additional strain on European health care systems. Health care expenditure is projected to grow by 25%, on average, across Europe. In Southern Europe, health care expenditure may increase approximatively from €1,450 per person in 2015 to €1,840 in 2050; in Northern Europe, from €1,910 to €2,300; and in Eastern-Central Europe from €300 to €350. Multi-morbidity (more than one chronic disease in the same person) will become increasingly common, with major consequences on physical functioning, quality of life, and life expectancy for the individuals concerned, as well as on the demand for health care services.

Figure 2. Prevalence of chronic disease, population aged 25+, Europe

Source: Analysis based on a new model developed by OECD for FRESHER project, 2017



Research carried out by the FRESHER consortium shows clinical parameters to be the strongest predictors of the incidence of a first chronic condition, but they did not play a role in progression from a single disease to multimorbidity, or risk of mortality in those with multimorbidity. On the contrary, socioeconomic and behavioural factors were found to be important prognostic factors; highlighting the need of improved consideration of non-clinical risk factors in secondary prevention.

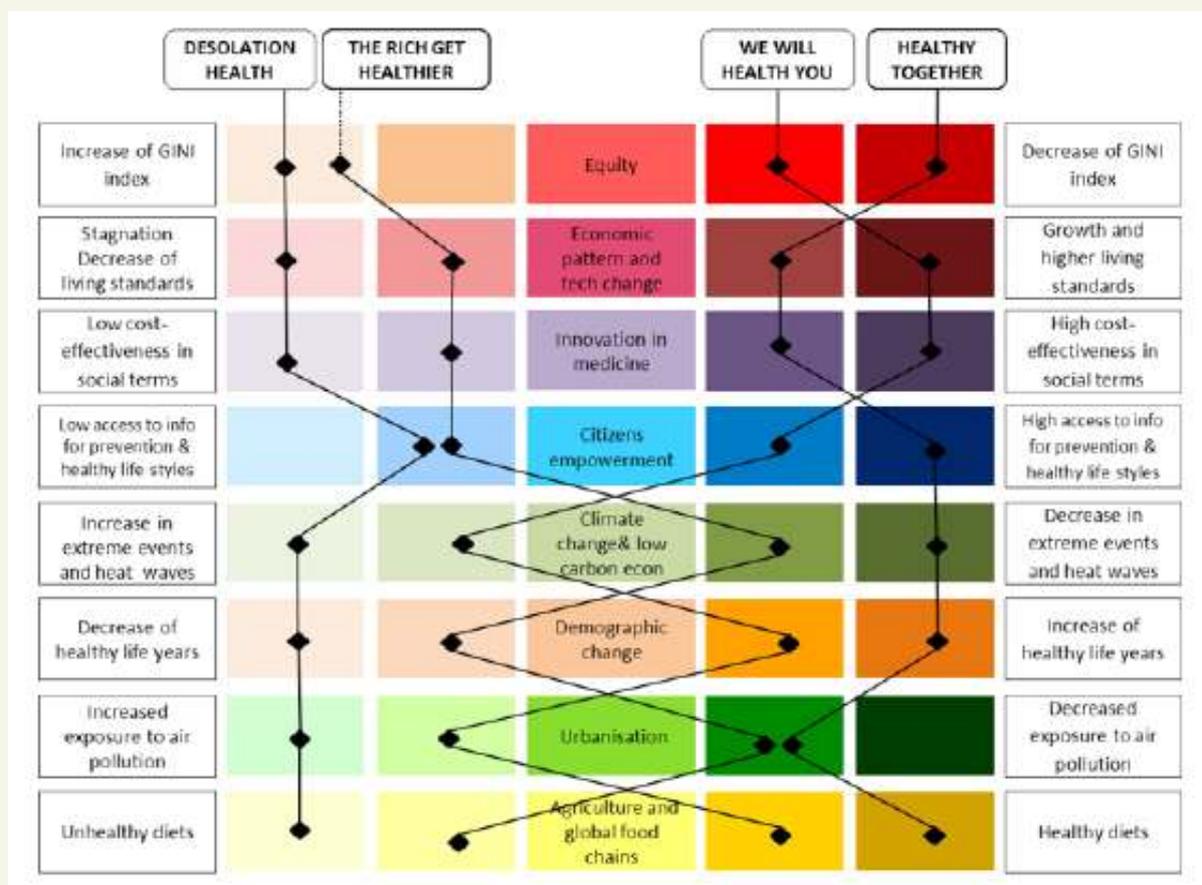
Moreover, estimates of health expenditures associated with multi-morbidities by the FRESHER project suggest, for instance, that treating a respiratory co-morbidity would increase the expenditure required to treat a case of diabetes by circa €670, and a cardiac co-morbidity would increase it by €860, relative to a cost of €1,780 for diabetes patients without co-morbidities.

Eight major trends will shape the future of health in Europe

The FRESHER project has identified the following trends that are especially likely to influence the health of people in Europe between now and 2050: demographic change, urban development, climate change and decarbonisation, food and agriculture, innovation in medicine, citizens' empowerment, economic & technological change, and equity. Depending on the directions of these trends in future years, chronic diseases will be impacted in different ways and to different degrees. **Four scenarios have been developed as part of FRESHER**, representing radically different visions of how the eight trends could evolve and influence health in the future by 2050.

The FRESHER Scenarios provide visions of the future aimed at supporting the planning of new policies and providing potential solutions for the future of health and chronic diseases in Europe. FRESHER Scenarios focus on the broader social determinants of health, exploring how structural changes in government policy, the economy, the environment and society at large influence citizens' behaviour, and consequently their health status. The four scenarios have been developed through a participatory approach and reflect the contributions and ideas a wide range of stakeholders.

Figure 3. How FRESHER Scenarios relate to eight key societal trends



Four Scenarios for the Future of Health in Europe

1. Staying the course: the rich get healthier

In this scenario, freedom and meritocracy are the pillars of societal structure. Market forces are dominant and a 'light government' guarantees their functioning. European states have tended to privatise the health-care sector to reduce public debt and have deregulated labour to revitalise the economy.

Health is now just like many other services: potentially available but expensive. Human health and lifestyle are left to individuals' choices and capacities. The more you can afford it, the better treatment you get, thanks to expensive medical innovations including new-generation biomedical devices. The global protection of the environment is ensured by pricing it.

It is a socio-economic system where most economies are decarbonised and climate change is now under control. However, global governance focuses on achieving results, without considering level of inclusion and equity of the solutions pursued.

2. We will health you: sustained innovation for a healthy workforce

In this second scenario, today's priority is to maintain a healthy workforce, for the continuation of economic productivity and for ensuring the sustainability of the healthcare systems.

Thanks to big data, public and private investments effectively influence citizens' behaviour towards healthy lifestyles. Employers provide healthy working environments and care services provided. Fair labour legislation is implemented to give workers money, time and knowledge to take better care of their health. The top down approach is ensured by ambient 24/7 surveillance and implanted chips for affordable early diagnostics, tele-medicine and tailor-made treatment. The new era of economic growth and social progress focused on delivering more to everyone, with environmental sustainability seriously overlooked. Increasing members of economic and environmental migrants are allowed in implementation of following strict immigration policy and by considering only their skills and possible contributions to the EU economy's growth.

3. Healthy together: promoting health and well-being for all

The main priority in society is to promote health and well-being for all. Governments, the private sector and citizens' networks collaborate closely to develop solutions to promote quality of life, healthy opportunities and efficient care. When governments take the lead, citizen participation is ensured throughout the policy making process, to promote equity, sustainability and human health in all policies. There is high value in leisure, sense of community and nature. Fair incomes level up living conditions, ensuring better standards to all. A new socio-economic pattern provides for the means to take better care of one's own health but also to care about others through informal networks and community engagement. Recycling and sharing practices lower the focus on productivity and pressure on the environment.



4. How it could go wrong: desolation health

The European model has declined and European governance, shared values and the common market have fallen apart amidst economic stagnation and recession.

To gain some legitimacy, national governments cooperate with different stakeholders for short-sighted policies and do not consider health implications. Economic stagnation has led many countries to gradually reduce number of people that can avail public services, increase user charges for services and limit the number of public health providers.

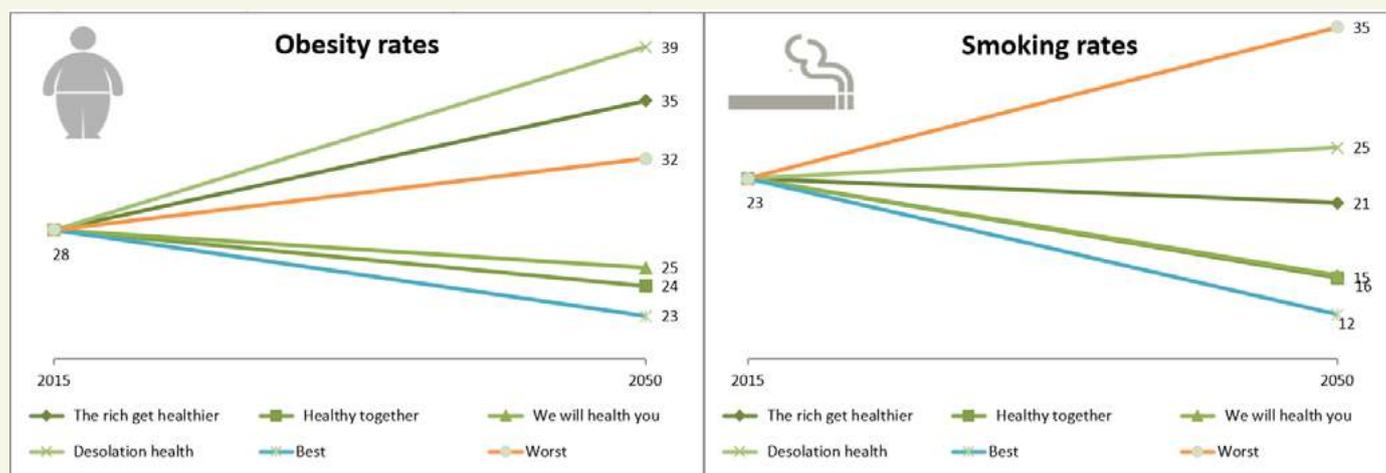
Health shocks -defined as unpredictable illnesses which diminish health status- increase, and innovative medicines, focusing on quick-fix solutions, and treatments remain hardly affordable for European governments and citizens. The deterioration of living standards undermine community values and lead to tensions among citizens and mistrust of policies. Citizens suffer the consequences of climate change as international agreements have stalled for decades.

Quantifying the impacts of alternative scenarios

The four scenarios are associated with evolving trends in the main risk factors for chronic diseases, based on the evaluations of health experts. Overall, two scenarios ('Healthy Together' and 'We will health you') are associated with reduced exposure to risk factors compared to the current situation, while the other two ('The Rich Get Healthier' and 'Desolation Health') are generally associated with a worse risk factor outlook. Tobacco smoking rates, for instance, are expected to continue the decline observed in most of Europe in recent years in three of the four scenarios, with the greatest reduction in the 'Healthy Together' scenario (from 23% in 2015 to 15% in 2050) and an increase to 25% in 2050 in the 'Desolation Health' scenario. These expert predictions are shown in the right-hand panel of Figure 4, with the left-hand panel showing the corresponding predictions for obesity. The figure also includes the rates which would be seen in Europe in 2050 if all countries converged to the lowest rates observed in Europe in 2015 ('Best' case prediction), or the highest rates observed in 2015 ('Worst' case prediction).

Figure 4. Expert-based predictions of risk factor levels, Europe, 2050

Source: FRESHER Experts' survey, 2017

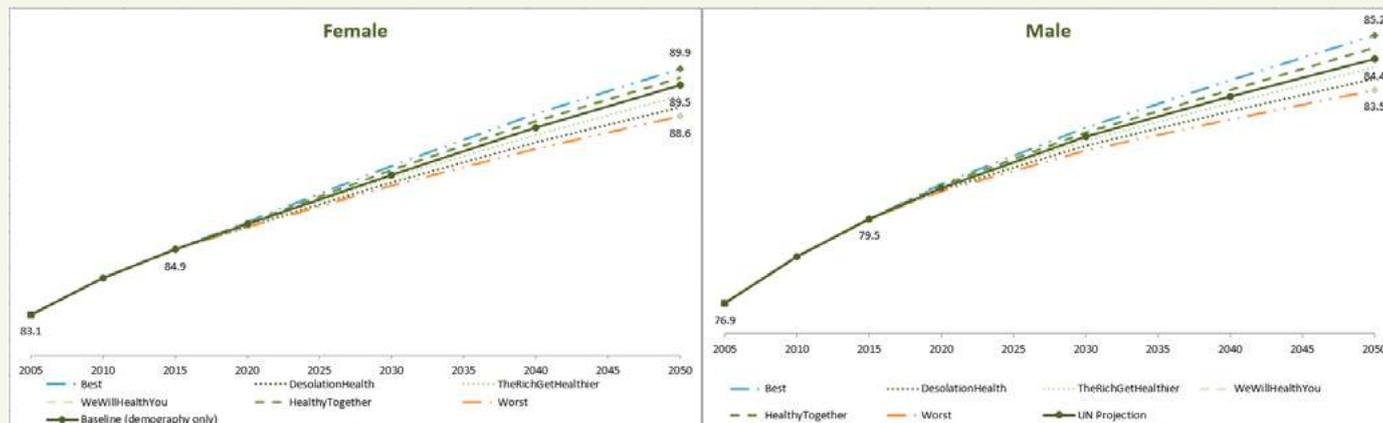


The changes in risk factors that have been predicted for the different scenarios may have a significant impact on chronic diseases, and ultimately on life expectancy, in the European population. Life expectancy is projected to grow compared to current levels, but to different degrees in the four FRESHER scenarios. Based on demographic projections, in 2050, women in Southern Europe will be expected to live 89.5 years. The changes involved in the different scenarios may add up to 6 months to this life expectancy, or reduce it by up to 10 months. Men in Southern Europe will be expected to live 84.4 years, with different scenarios potentially adding up to 9 months or reducing it by up to 11 months (Figure 4). In Northern Europe, scenarios potentially add up to 8 months or subtract up to 11 months from projected life expectancies of 84.3 years for men and 87.2 for women. In Eastern-Central Europe, scenarios potentially add up to 8 months or subtract up to 12 months from projected life expectancies

of 77.7 years for men and 83.5 for women.

Figure 5. Life expectancy according to the different foresight scenarios, men and women, Southern Europe

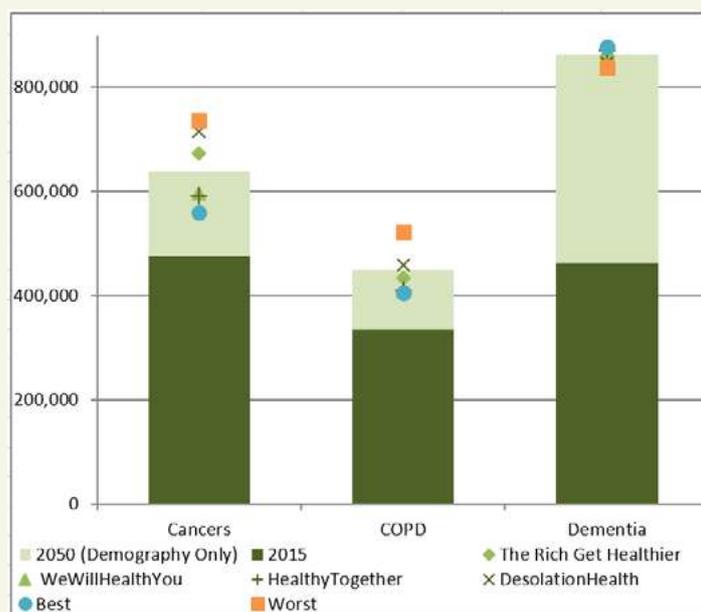
Source: Analysis based on a new model developed by OECD for the FRESHER project, 2017



The scenarios ‘The Rich Get Healthier’ and ‘Desolation Health’ would lead to increased numbers of new cases of chronic diseases (like diabetes, cancers, COPD, IHD, stroke), while the scenarios ‘Healthy Together’ and ‘We will health you’ would lead to reduced numbers of cases (Figure 6). The best and worst case scenarios, based on countries converging to the best and worst risk factor levels observed in 2015, have the most extreme outcomes. Dementia is a partial exception to the pattern described above: as people live older with fewer chronic diseases in the more favourable scenarios, the incidence of dementia tends to increase slightly.

Figure 6. New cases of chronic diseases according to the different foresight scenarios, Southern Europe

Source: Analysis based on a new model developed by OECD for the FRESHER project, 2017

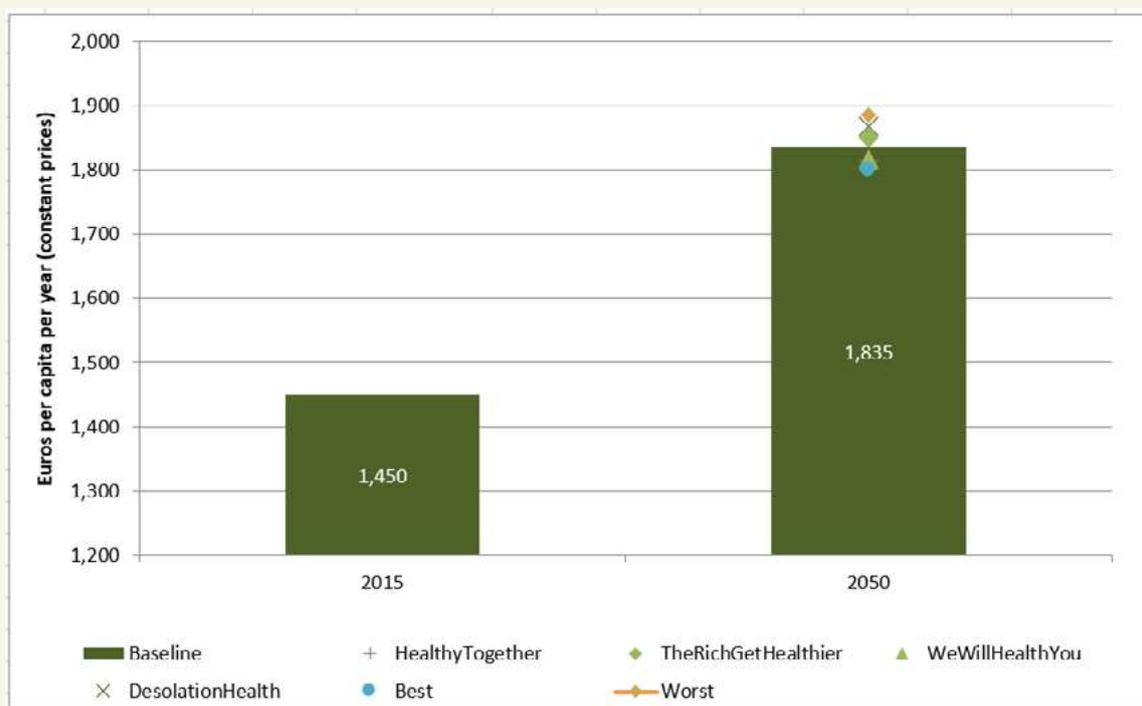


The projected health impacts of the four FRESHER scenarios are important, but relatively small compared with those of underlying demographic trends. None of the scenarios is projected to offset the life expectancy gains envisaged by current population projections. This means that an increase in chronic diseases is to be expected as an effect of population ageing, which could be fuelled or mitigated to some degree by societal trends, but would not be changed fundamentally in the absence of dramatic changes in policy or human behaviour.

The impacts of scenarios on health care expenditure are relatively minor compared to the projection of a 25% increase in health expenditure driven by the sole effect of population ageing. In Southern Europe, health care cost per capita will vary by -2% to +3% across different scenarios (Figure 7).

Figure 7. Impacts of scenarios on health expenditures, Southern Europe

Source: Analysis based on microsimulation, 2017

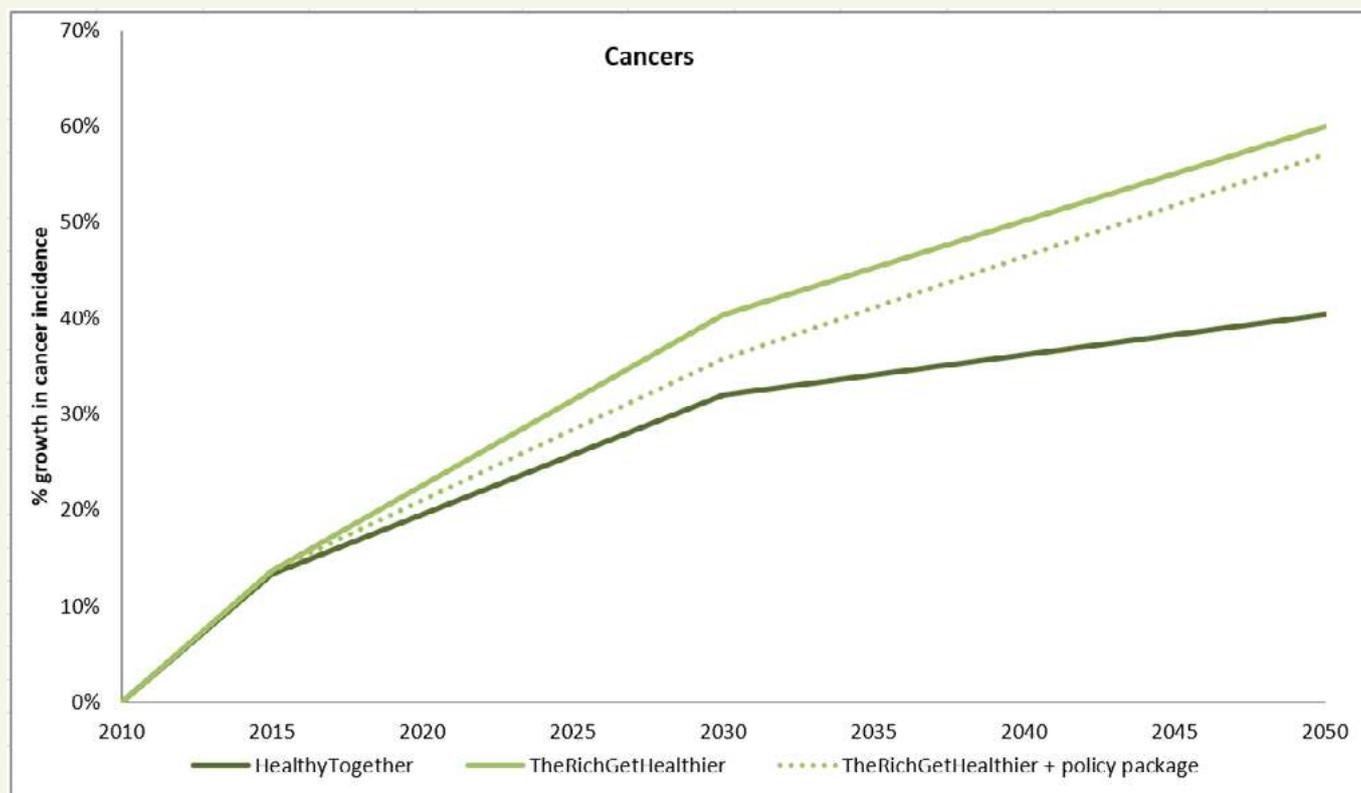


Europe needs greater environment and lifestyle improvements: how can we do better than today?

A first step to improve the health outlook for the European population would involve a consistent implementation of the public health policies which have been proven effective in reducing the prevalence of poor diets, sedentary behaviours, obesity, tobacco smoking and harmful use of alcohol across the whole of Europe. The FRESHER project has assessed the impacts of a combination of the most efficient policies aimed at tackling the above risk factors, finding that life expectancy would be prolonged by one month on average between 2018 and 2050, and the incidence of diseases would be reduced. In Southern Europe, a similar combination of policies would bend downwards the increasing trend in new cases of cancer compared to the scenario 'The Rich Get Healthier' (Figure 8). The policies would shift downwards the trend of the new cases of cancers –the increase of cancer new cases between 2010 and 2050 is estimated at 60% in 'The Rich Get Healthier' while 57% when policies are accounted for. For comparison, the 'Healthy Together' scenario would lead to an increase in the incidence of cancer of 40%.

Figure 8. Impacts of a combined set of policies on new cases of cancers, Southern Europe

Source: Analysis based on a new model developed by OECD for the FRESHER project, 2017



Based on its computer simulation analyses, the FRESHER project provides evidence that a consistent implementation and scaling up of established public health policy approaches in

tackling major risk factors for chronic diseases would lead to some improvements in the health of the European population. However, those policies alone can, at best, bend the increasing trend of chronic diseases. Those policies will not be sufficient to offset the impacts of current demographic trends, even if supported by favourable societal trends, as encapsulated in the healthier FRESHER scenarios.

European countries will face the dual challenge of an increasing burden of chronic diseases, crippling their workforce, productivity and welfare systems, and of an increasing demand for health services, leading to a rise in health and social expenditure. If all this is to be avoided, radical and innovative solutions are required, only some of which may be in sight today. The Sustainable Development Goals agenda for 2030 adopted in September 2015 by the United Nations offers an opportunity to elaborate and promote new inter-sectorial and global policies which would contribute to the control of NCDs.

Treating chronic diseases more and more efficiently, preventing their complications, optimizing medical drug prescriptions, especially in the oldest segment of the population, and coordinating effectively the care required by patients with multiple morbidities are all key steps in containing further growth in health and social care expenditure. However, the most radical, and most difficult, changes required are those that may reduce the number of people with chronic conditions. These changes include focusing public policies on reducing socio-economic and health inequalities, new ways of designing urban environments; new attitudes to the production and consumption of food and nutrition, to physical activity and to the use of technology in everyday life; and new and cleaner means of transportation, production and energy generation. New policies and grassroots initiatives must develop around these objectives, aiming at a much larger impact than those public health measures that have been attempted so far to prevent chronic diseases.



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