# Optimising the response to the epidemic of chronic diseases

## European Chronic Disease Alliance input to the Reflection Process on chronic diseases

# Annexes 1 – 4

# The major health determinants in chronic disease

The ECDA published in 2010 a report entitled "A Unified Prevention Approach" which was presented to Health Commissioner John Dalli in June 2010. It proposed a number of key measures that could form the basis for a coordinated and common strategy for the prevention of chronic diseases in Europe. The report focused on the key major health determinants i.e. tobacco, nutrition, alcohol and physical inactivity. The summary of the ECDA recommendations are presented below.

## Tobacco

The scientific evidence for the adverse health effects of smoking is overwhelming. There is a direct correlation between the number of cigarettes smoked and the risk of cancer, cardiovascular and chronic obstructive pulmonary diseases. Smoking, or exposure to smoke, causes up to 90% of lung cancers and is also proven to be an independent risk factor in diabetes. In general, about half of all continuing regular smokers will be killed by their smoking. Smokers who die in middle age as a result of their smoking lose about 22 years of life, with a larger proportion of that shortened life span being spent in ill health. However, stopping smoking before middle age largely eliminates this risk. Smoking increases the risk of cardiovascular disease five-fold in young and two-fold in older people. In addition, it is associated with both the onset and progression of Chronic Kidney Disease. It is estimated that approximately 650 000 EU citizens die prematurely every year because of tobacco consumption.

Young people who do not start smoking before the age of 20 will usually never smoke at all, which enormously increases the urgency of measures to protect young people from starting, such as the removal of vending machines and of cigarette packets from point of sale display as well as ensuring that tobacco is highly taxed.

Passive smoking poses a massive risk to public health. According to conservative estimates, approximately 80 000 adults, including almost 20 000 non-smokers, died in the EU-15 in 2002, because of diseases caused by exposure to tobacco smoke at home and in the workplace. The successful implementation of the measures proposed in the Framework Convention on Tobacco Control (FCTC), in particular those relating to smoking in the workplace, have already reduced the incidence of heart attacks by 17-19% in several countries. This success needs to be extended by the ratification and enforcement of the FCTC by all Member States. Implementing tobacco control strategies will require greater levels of investment across the EU, but economic evidence indicates that this is the second most cost-effective use of health funds after childhood immunisation. The European Commission has a clear role to play in coordinating and supporting these measures at a national level across all Member States.

Experiences within the European region, as well as worldwide, provide considerable knowledge on useful methods in controlling the use of tobacco. Immediate research priorities have been identified to clarify the true scale of the tobacco epidemic, mostly decreasing in males and increasing dramatically in females, especially in southern and central European countries: better understanding of the effects of tobacco on health and to best direct resources towards its control, improved surveillance data, standardised methodologies for research, particularly in the case of prevalence and mortality, and regular measurement of smoke exposure across all populations. It is essential that all regulation, research and advice, both at Member State and European level, be absolutely independent of all

influence from the tobacco industry. Article 5.3 guidelines of the FCTC on the protection of public health policies with respect to tobacco control from commercial and other vested interests of the tobacco industry should be transposed into national legislation and ministerial/public service codes of conducts of the Member States. They should also be strictly observed by the European Commission.

The tobacco industry is already required to disclose additives used in their products. This should extend to all chemical and design characteristics of these products, including the type of tobacco used, the way it is processed, the physical and chemical characteristics of its emissions, as well as the mode of use and behaviour of the user. Only in this way will it be possible to make comparisons between different tobacco manufacturers and establish a harmonised system for Member States to analyse, verify and finally report this information to the Commission.

## Recommendations for reducing the use of tobacco

### At EU level

- Ensure that taxation on tobacco is harmonised at a high level across the EU

- Cigarette packets should adopt a compulsory standardized packaging with all branding elements removed and 80% of the packet front and back devoted to pictorial health warnings

- Dealings with the tobacco industry, across the EU, should be absolutely transparent

- Internet sales of tobacco should be banned

- All regulatory, scientific and advisory capacity, at Member State and European level, to be independent of all tobacco industry influence - in line with FCTC Art 5.3 Guidelines

- Comprehensive disclosure of the physical, chemical and design characteristics of all tobacco products should be required and made public Ref. FCTC Arts 9 and 10 Guidelines

- Ensure accurate data about quantities of tar, nicotine and CO with qualitative information about hazardous content and 'stop smoking' help lines

### At Member State level

- All EU Member States should fully implement the Framework Convention for Tobacco Control (FCTC)

- All EU Member States should implement comprehensive bans on tobacco advertising and promotion, including on displays at point of sale in line with the FCTC

- All EU Member States should introduce a comprehensive ban on smoking in all public and workplaces

- Apply annual increases in tobacco tax above inflation as the most effective way to control consumption

- Cigarettes vending machines, should be banned

- Further development of smoking cessation and treatment strategies across all Member States including training of health professionals, increased accessibility of nicotine replacement therapies and national networks of treatment services

## Nutrition

There is a direct correlation between eating patterns and the prevalence of obesity, type 2 diabetes, cardiovascular disease, hypertension, emphysema, respiratory infections and certain types of cancer.

Low fruit and vegetable intake has been estimated to account for 4.4% of the burden of disease. Fruit and vegetables have a high content of vitamins, minerals, antioxidants and phytochemicals and play a positive role in preventing CVD, diabetes and specific cancer types. It is estimated that fruit and vegetable intake of 600 g per day could reduce the risk of coronary heart disease by up to 18% and stroke by 11%. This could prevent over 135 000 deaths from cardiovascular diseases each year.

A study published in NEJM warns that reductions in deaths resulting from cardiovascular disease could come to a halt as people get fatter. In contrast, a recently published WHO study suggests that deaths could be reduced by half by adopting a healthier diet and giving up smoking. Between 1970 and 1990 the death rate from cardiovascular disease fell by half, due to reductions in smoking, cholesterol levels and hypertension alongside an increase in physical activity. This trend has been halted since 1990 in young people due to the rise in obesity and increase in numbers of people with diabetes.

Much can be achieved by making relatively small changes across the broader population. These interventions target the risks faced by the entire population, from their social, economic and physical environments, and are also effective in reducing health inequalities. They include measures such as taxation on foods that are high in fat, salt and sugar, as well as reformulation measures (improving the composition of food to reduce the level of fat, saturated fat, salt and added sugar). Clear and easily understandable information on nutrition is crucial to the success of these interventions. Survey results consistently suggest that consumers like and understand a simple front of pack nutrition label, with traffic light colours, indicating whether the nutrient is present at a low, medium or high level. A simple traffic light system thus enables consumers to make informed choices.

The risks of a diet containing too many calories are shown in Europe and North America, where fast foods and soft drinks are increasingly popular. In countries such as Italy and Greece, where a traditional diet containing large amounts of fruit and vegetables has been replaced by foods high in carbohydrates and saturated fats, obesity, diabetes and coronary heart disease are on the increase.

Regulation is needed to control the use of transfats, which have been officially identified by WHO as a "clear risk for human health" as they contribute significantly to an increased risk of coronary heart disease events. Examples of successful legislation against the use of transfats are in existence in Denmark, Austria, Iceland and Switzerland.

The availability of fast and convenience foods should be reduced, in particular to younger people, for example through eliminating advertising and snack dispensers in schools. In Scotland restrictions have been introduced to limit the use of saturated fats in school meals, in particular through fried foods, but the effect of such measures is reduced by the availability of other outlets in the nearby locality.

High salt intake, coming mainly from processed foods, contributes to high blood pressure which in turn increases the risk of stroke, chronic kidney disease, coronary heart disease and diabetes. Some intervention studies show that a diet high in salt may increase the severity of disease in those with asthma, and that pulmonary function may improve in people with asthma who adopt a low salt diet. Several European countries have successfully reduced salt intake, through regulation and better labelling of processed foods. Such population wide interventions are likely to produce health benefits similar in magnitude to reductions in tobacco use, cholesterol levels and obesity. Measures are urgently needed to reduce the consumption of salt to less than five grams per day in all EU countries, as already successfully achieved in Finland.

Self-regulation by the industry on reducing salt is currently the policy makers' preferred option. It should be noted that voluntary measures for alcohol and tobacco have failed. Conversely, regulatory approaches have consistently proved to be the most effective, efficient and cost-effective way of achieving public health targets. This is what has been done in Finland, Japan and now Portugal. A law substantially reducing the amount of salt contained in bread was adopted in Portugal in March 2009.

Much has been done in recent years to improve nutritional health and try to reduce the prevalence of diabetes and cardiovascular disease as well as certain types of cancer. It is essential to maintain the political will to continue to take action. The introduction of a periodic report on nutritional health would help a great deal in maintaining momentum.

The 2007 Audiovisual Media Service Directive called upon governments and the European Commission to 'encourage media service providers to develop codes of conduct regarding inappropriate advertising of 'unhealthy' food and drinks in or accompanying children's programmes'.  However, the code of conduct has not been taken up in all Member States, and it is recognized that, given the intense marketing of goods in the internal market, measures can only be effective if harmonised across the EU. Nor do the restrictions limit internet sales and promotion.

### *Recommendations for improved nutrition*

#### At EU level

- Efforts to reduce the fat, sugar and salt content of mainstream food and drink products should be a key priority for Europe. The European Commission should set a firm agenda for progress in product reformulation. If the collaborative voluntary approach does not deliver results within that timescale, the Commission should introduce rules setting maximum levels of these nutrients/ingredients for different foodstuffs

- The European Commission should bring forward a proposal for an EU-wide ban on the addition of industrially produced transfats in foodstuffs marketed in the EU

- Mandatory food labelling on front and back of pack should include traffic light colour coding to facilitate consumer education and understanding

- An integrated European Food and Agriculture Policy which works towards improving European diets in a sustainable way should be developed; it should provide for, inter alia, an increased supply of and access to affordable fresh fruit and vegetables

- EU-wide measure to prohibit all marketing of 'unhealthy' food to children through television and non-broadcast media

- Research into measures by which internet advertising can be discouraged

### At Member State level

- Control the provision and sale of fatty snacks, confectionery and sweet drinks in public institutions, such as schools and hospitals

- Introduce subsidies on healthy foods to improve patterns of food consumption

## Alcohol

The use of alcohol accounts for over 7% of all ill-health and premature deaths in the EU. The prime target for damage is the liver. Indeed excessive consumption of alcohol is a major cause of cirrhosis and liver failure and also cancer (e.g. breast, oral cavity, oesophagus, pharynx), cardiovascular diseases and brain damage. Studies show that up to 9% of cancer incidence in Europe is attributable to alcohol intake. Several cancers, namely cancers of the oral cavity pharynx, larynx and oesophagus as well as breast, liver and colorectal cancer are causally linked to excess alcohol consumption.

Alcohol is also an immune-suppressant, increasing the risk of communicable disease in particular respiratory infections. It is also a potent teratogen, harming the foetus, including low birth weight, cognitive deficiencies and foetal alcohol disorders. Alcohol is processed in the body very similarly to the way fat is processed and provides almost as many calories.

The majority of alcohol control programmes are cost saving and effective. Benefits are rapid, usually within months of implementing legislation to control alcohol availability and use.

Price is a key driver in determining alcohol consumption. This is directly affected by increased taxation. A rise in excise duty is always cost effective since taxation policies cost relatively little to implement and can reap substantial health, as well as financial, returns.

Legislation to reduce the legal level of alcohol in car driver's blood, combined with an increase in roadside breath testing, has been extremely effective in reducing the number of deaths through traffic

accidents. Public information programmes, and media focus, have put drink-driving on the public and political agendas and have done much to reduce the social acceptability of driving with alcohol in the bloodstream.

Advertising increases the likelihood that children and adolescents will start to use alcohol and will drink more if they are already using alcohol. Legislation is badly needed to offset the budget inequalities involved in alcohol promotion. Last year, in the UK alone, £600 million was spent by the industry on promotion, whilst a mere £18 million was spent on education designed to reduce the abuse of alcohol. One immediately effective way to offset this difference would be the imposition of a ban on all price-related alcohol promotion.

Labelling is also a potentially important information tool for communication between producers, public authorities and consumers. Labels could inform customers of the dangers and health risks associated to the consumption of alcohol.

Early recognition of an alcohol related disorder is vital. A brief but timely intervention by a health professional is an extremely cost-effective way of preventing further harm. There is a clear need for specific training for staff in primary care, in emergency rooms and in schools, to recognize the signs of alcohol-use disorders and to deliver effective, brief interventions.

School based education alone is largely ineffective in protecting young people from early alcohol consumption. Perhaps predictably, industry-funded education programmes actually tend to have the reverse effect.

Reduction of access to retail outlets, and implementation of a comprehensive advertising ban have the potential to be very effective, but only if they are fully enforced across all Member States. The economic arguments for doing this are compelling: every healthy year of life gained saves approximately €500.

## *Recommendations for the reduction of alcohol consumption*

### EU level

- Ban alcohol advertising, promotion and sponsorship of events via TV radio programmes and sports

- Introduction of uniform minimum EU tax rates for all alcoholic beverages and their increase in line with inflation

- Restrict the amount and content of advertising for alcohol products: in particular all elements that have proved to be appealing to young people

- Use of educational programmes to reinforce awareness of the problems created by alcohol and to prepare the ground for specific interventions

### Member State level

- Reduce the availability of alcohol through restriction in the number of outlets for alcohol purchase

- Widespread help through primary-care agencies and intensive help for alcohol dependence

- Training for staff in primary care, in emergency rooms and in schools, to recognize the signs of alcohol-use disorders and to deliver effective, brief interventions

- Legal concentrations in the blood reduced eventually to 0.2 g/L, for all vehicle drivers, with stringent enforcement

# Physical inactivity

As mechanisation has reduced the need for manual labour and exercise, resulting in more sedentary lifestyles, the prevalence of the diseases addressed by this Alliance has increased. The World Health Organisation (WHO) describes physical activity as 'a fundamental means of improving the physical and mental health of individuals.' Physical activity is key to reducing the risk of cardiovascular and respiratory diseases, cancer, obesity, type 2 diabetes as well as liver diseases.

Lack of physical activity during childhood increases overweight and obesity. The WHO estimates that within a decade this trend will affect 5 million children, with a further 15 million overweight. The majority will carry their obesity into adult life. Type 2 diabetes is now being reported in children and is directly linked to obesity. Evidence shows that between 3% (males) and 6% (females) of cancer cases in Europe may be attributed to lack of physical activity and these figures are likely to increase. Furthermore, a causal link has been established between excess body mass index (BMI) and increased risk of several cancer types. Indeed, it is understood that physical activity reduces the risk of colon cancer, probably reduces the risk of breast and endometrial cancers and possibly reduces the risk of prostate, lung and ovarian cancers.

As people get older, some types of physical activity become more difficult. However some activities are suitable, even for the aged such as walking and gardening & cycling. Therefore increasing physical activity is an important message, especially in an ageing population.

In some areas appropriate fitness facilities are scarce and accessible only to some communities. Better facilities for physical exercise as well as planning measures to encourage greater physical activity play a great part in combating these diseases. But with the shift to academic subjects a priority within the school curriculum, many schools have had to reduce, or even phase out, physical education through lack of time. This has been further exacerbated by the sale of playing fields for development, by many local authorities. With the responsibility for physical exercise now shifting to extra-curricular sports clubs, the questions of safety and public transport become increasingly important.

There are many other areas of urban planning where simple measures could be taken to encourage greater activity, such as the provision of more and safer cycle lanes and footpaths, and making stairs more visible and accessible than lifts and escalators in public buildings.

Lifestyle interventions involving consistent physical activity and regulated diet, significantly reduces the incidence of type 2 diabetes and reverses the glucose intolerance which precedes it. Just one half hour of moderately vigorous activity a day, over and above normal levels, will reduce weight by 1-2kg per year. With sufficient support and monitoring, these interventions can be successfully implemented by a wide range of professions, in a wide range of settings, for a wide range of ethnic and age groups.

It will be important to promote physical activity also as a normal part of healthcare, and actions should be taken to include guidance on how to translate general public health recommendations on physical activity into levels that correspond to the capacity of a patient. Physical activity not only delays onset of chronic diseases but is also important for reducing severity of disease.

## *Recommendations for increased physical activity*

### At EU level

- Intensify the collection, analysis and dissemination of information on effectiveness of interventions in the area of physical activity

- Monitor EU citizens' participation in physical activity through regular surveys

### At Member State level

- Set urban planning standards prioritising non-motorised transport and for recreational areas encouraging physical activity

- Each school child to have access to periods of physical activity each day at school, and to be encouraged to after school physical activity

- Regular monitoring in all areas of child and adolescent growth and development e.g. height, weight, lung capacity etc.

- Improve facilities for physical activity in schools, and an end to the disposal of recreational land for development

- Encourage the implementation of the above recommendations at regional and local levels

**Table 2. Health care interventions to tackle noncommunicable diseases: identifying 'best buys'**

| Disease (% global burden; DALYs[a]) | Interventions / actions (* core set of 'best buys') | Avoidable burden (DALYs averted, millions) | Cost-effectiveness[b] (US$ per DALY prevented) [Very = < GDP per person; Quite = < 3* GDP per person; Less = >3* GDP per person] | Implementation cost (US$ per capita) [Very low = < US$ 0.50; Quite low = < US$ 1; Higher = > US$ 1] | Feasibility (health system constraints) |
|---|---|---|---|---|---|
| **Cardiovascular disease (CVD) and diabetes** (170 m DALYs; 11.3% global burden) | Counselling and multidrug therapy (including glycaemic control for diabetes mellitus) for people (≥30 years), with 10-year risk of fatal or nonfatal cardiovascular events ≥ 30% * c | 60 m DALYs averted (35% CVD burden) | Very cost-effective | Quite low cost | Feasible (primary care) |
| | Aspirin therapy for acute myocardial infarction * | 4 m DALYs averted (2% CVD burden) | Very cost-effective | Quite low cost | |
| | Counselling and multidrug therapy (including glycaemic control for diabetes mellitus) for people (≥ 30 years), with a 10-year risk of fatal and nonfatal cardiovascular events ≥ 20% | 70 m DALYs averted (40% CVD burden) | Quite cost-effective | Higher cost | |
| **Cancer** (78 m DALYs; 5.1% global burden) | **Cervical cancer screening (VIA), and treatment of pre-cancerous lesions to prevent cervical cancer*** | 5 m DALYs averted (6% cancer burden) | Very cost-effective | Very low cost | Feasible (primary care) Treatment may require referral |
| | Breast cancer – treatment of stage I | 3 m DALYs averted (4% cancer burden) | Quite cost-effective | Higher cost | Not feasible in primary care |
| | Breast cancer – early case-finding through biennial mammographic screening (50–70 years) and treatment of all stages | 15 m DALYs averted (19% cancer burden) | Quite cost-effective | Higher cost | |
| | Colorectal cancer-screening at age 50 and treatment | 7 m DALYs averted (9% cancer burden) | Quite cost-effective | Quite low cost | |
| | Oral cancer – early detection and treatment | Not established globally | Not assessed globally | Not assessed | |
| **Respiratory disease** (60 m DALYs; 3.9% global burden) | Treatment of persistent asthma with inhaled corticosteroids and beta-2 agonists | Not established globally (expected to be small) | Quite cost-effective | Very low cost | Feasible (primary care) |

a DALYs (or disability-adjusted life years) are widely used as a measure of premature mortality and ill-health - one DALY can be thought of as one lost year of healthy life.

b Prevention and control of NCDs: priorities for investment. Discussion paper for the First Global Ministerial Conference on Healthy Lifestyles and Noncommunicable Disease Control. Geneva, World Health Organization, 2011.

c Includes prevention of recurrent vascular events in people with established coronary heart disease and cerebrovascular disease.

# Early detection of chronic disease

## *Early detection of chronic respiratory diseases*

The earliest possible detection of disease and the best possible integrated and multi-disciplinary care are required when the disease is established and effective treatment exists. For example screening the general population for respiratory symptoms and lung function has been shown to be an effective method for detecting subjects with a mildly but persistently impaired lung function at an early undetected stage of the disease. When compared to other diseases, the cost per detected case is even relatively cheap, see table 1 below.

**Table 1**

Cost per detected case in screening programmes[1]

| Disease | Cost per detected case |
|---|---|
| Hypertension | 127 |
| Abdominal aortic aneurysm | 508 |
| COPD/asthma | 573 |
| Hypercholesterolaemia | 1117 |
| Prostate cancer | 4060–6598 |
| Breast cancer | 5786–23753 |
| Glaucoma | 13196 |
| Down's syndrome | 50755 |
| Cystic fibrosis | 63951–317219 |
| HIV | 125872 |

If every citizen had a regular lung health check, it would be possible to plan for those likely to require respiratory healthcare. This would enable us to anticipate respiratory health burdens of the future, and conveys a simple message about getting the public to understand the most basic function of their respiratory system, and preserve optimum lung capacity for each individual.

In asthma there is good evidence that early diagnosis resulting in early treatment with inhaled corticosteroids is effective, improves health outcomes and significantly reduces the socioeconomic burden of the disease, although medication continues to be the major component of the cost of asthma treatment. The Global Initiative for Asthma (GINA) published in 2011 the revised Guidelines on a Global Strategy for Asthma Management and Prevention with the most updated recommendations.[2] Furthermore, screening for nutritional status and weight is of particular relevance in respiratory

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[1] Van Shayck CP, Chavannes N: Detection of asthma and chronic obstructive pulmonary disease in primary care. *Eur RespirJ* 2003, 21: Suppl 39, 16s-22s.http://www.erj.ersjournals.com/content/21/39_suppl/16s.full.pdf+html
[2] Global Strategy for Asthma Management and Prevention 2011  http://www.ginasthma.org/uploads/users/files/GINA_Report_2011.pdf

conditions. Regular monitoring in all areas of child and adolescent growth and development e.g. height, weight and lung capacity should be initiated in the EU Member States.

COPD is a leading cause of morbidity and mortality worldwide, and results in an economic and social burden that is both substantial and increasing. The prevalence and morbidity data greatly underestimate the total burden of COPD because the disease is usually not diagnosed until it is clinically apparent and moderately advanced.[3,4] Delayed diagnosis results in patients suffering symptoms and limitations that could otherwise be alleviated by treatment. Spirometry is the most reliable detection method for COPD. Tobacco smoke is by far the most important risk factor for COPD worldwide. Other important risk factors are occupational exposures, socio-economic status and genetic predisposition. The latest evidences in COPD have proven that early detection in stages 1 and especially in stage 2 achieve significant improvements in the natural history of the disease.[5, 6] The Global Initiative for Chronic Obstructive Lung disease (GOLD) have released updated 2011 Guidelines on a Global Strategy for Diagnosis, Management and Prevention of Chronic Obstructive Pulmonary Disease which based on multiple scientific and clinical achievements since 2001.[7]

## *Early detection of cancer*

Cancer, comprising approximately 100 different types of malignant tumours of the body organs, is the second largest cause of death after CVD and the first cause of death at middle age, when mass screening programmes are offered for cervical, breast and colorectal cancer. Annually, there were about 3.2 million new cases and 1.7 million deaths in 2008. The most frequent cancers with each 13% of the total are colorectal, breast, prostate and lung cancer, whereas most deaths are due to lung (20%) and colorectal cancer (12%), breast cancer (7.5%) and stomach cancer (7%).

There is evidence for efficacy of screening in reduction of mortality in breast (by 25%), colorectal (20-25%) and cervical cancers (up to 80%) through mammography, FOB test and the Pap test/visual inspection respectively.

## *Early detection of cardiovascular diseases, including hypertension*

Across the European Union, millions of people are at high risk of developing and dying prematurely from cardiovascular diseases (CVD). There is a significant amount of CVD morbidity and mortality that could be prevented through early detection and primary prevention of these diseases

The aim of CVD risk-assessment programmes is to detect people who are at high risk, and to reduce the risk factors of those vulnerable to developing these diseases.

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[3] Celli BR, MacNee W, ATS/ERS Task Force: Standards for the diagnosis and treatment of patients with COPD: a summary of the ATS/ERS position paper. *Eur Respir J* 2004, **23**(6)**:**932-46.

[4] Price D et al: Earlier Diagnosis and earlier treatment of COPD in primary care. *Prim Care Resp J* 2011 20(1):15-22

[5] Stockley RA: Progression of chronic obstructive pulmonary disease: Impact of inflammation, comorbidities and therapeutic intervention. *Curr Resp Med Opin,* 2009, 25(5):1235-45

[6] Averame G et al "Alliance Project" Study Group: Office spirometry can improve the diagnosis of obstructive airway disease in primary care setting**.** *Respir Med* 2009, **103**(6)**:**866-72.

[7] Global Strategy for the Diagnosis, management, and prevention of chronic obstructive pulmonary disease. http://www.goldcopd.org/uploads/users/files/GOLD_Report_2011_Jan21.pdf

Importantly, these programmes will not only identify those at risk but will also ensure that the individuals are helped to reduce their risks, and avoid the onset of disease, through early primary prevention interventions e.g. smoking cessation, weight management, exercise interventions and use of medication in accordance with the European Guidelines on Prevention of Cardiovascular Diseases in Clinical Practice.[8]

CVD risk-assessment programmes should target people aged 30-65 who are not currently on a disease register or diagnosed with cardiovascular diseases.

Assessing risk of CVD requires the use of a validated risk-score tool which integrates multiple risk factors. Several risk-score tools are available and validated. About five basic elements are sufficient for assessing CVD risk: sex, age, tobacco use, blood cholesterol and blood pressure. These are included in all validated risk-score tools. In addition, the assessment could include taking the pulse which would allow identifying asymptomatic atrial fibrillation. Other elements are full lipid profiles (LDL, HDL cholesterol and triglycerides), family history of premature CVD, diabetes, body mass index, waist circumference and lifestyle factors other than smoking (e.g. exercise, intake of fruit and vegetables) as well as social deprivation. The measurement of all elements are straight forward, non-invasive and relatively cheap.

Where very high levels of individual risk factors are found, the assessment should be expanded to include family members. In particular, where very high level of blood cholesterol is found cascade-screening should take place. In deprived communities, the rate of high-risk individuals is known to be significantly higher than in other areas[9]. It is, therefore, critical to establish structures that enable the inclusion of hard-to-reach groups and to perform opportunistic risk-assessment.

It is preferable that life-time risk is assessed since age is a predominant risk factor. Lifetime risk assessment avoids underestimation in younger individuals. However, it should be noted that even well-validated risk-score tools assessing lifetime risk may underestimate risk in some ethnic groups, for whom not enough data are available, and overestimate risk in higher socio-economic groups.

CVD risk assessment should be repeated with a five-year interval for those not found at high risk or diagnosed with cardiovascular disease.

## *Early detection in chronic kidney disease*

Kidney diseases (both chronic and acute) have recently been identified in the global non-communicable disease (NCD) action plan, recently adopted in the UN political declaration. There is indeed compelling evidence that kidney disease is a key determinant of the poor health outcomes of diabetes and cardiovascular disease (including hypertension), and prevention of kidney disease requires attention within national NCD programs particularly at the primary-care level as recommended by the WHO.

CKD is associated with an eight- to tenfold increase in cardiovascular mortality and is a risk multiplier in patients with diabetes and hypertension. Milder CKD (often due to diabetes and hypertension) may affect up to 10% of the population and is more common in developing countries and disadvantaged and

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[8] European Guidelines on Cardiovascular Disease Prevention in Clinical Practice, European Journal of Cardiovascular Prevention and Rehabilitation, 2007, http://www.escardio.org/guidelines-surveys/esc-guidelines/GuidelinesDocuments/guidelines-CVD-prevention-ES-FT.pdf
[9] Cardiovascular diseases inequalities: causes and consequences. Capewell, S. http://www.slideshare.net/sanidadyconsumo/cardiovascular-disease-inequalities-causes-and-consequences

minority populations, also in developed countries. As with many NCDs, awareness of CKD is low, generally less than 20%, even at more advanced stages and in developed nations.

Early detection and treatment of CKD using readily available, inexpensive therapies can slow or prevent progression to end-stage renal disease (ESRD) and will be associated with a reduction in premature cardiovascular disease.

Also in European countries early detection of CKD has been facilitated by the implementation of routine reporting of estimated glomerular filtration rates (eGFRs) by simple serum creatinine measurement and by education of primary care physicians on the implications of detecting a decreased eGFR with respect to patient safety as well as to cardiovascular and renal outcomes.

Even a mild reduction in estimated glomerular filtration rate (eGFR) is associated with adverse clinical outcomes, as is increased urinary protein excretion. Among subjects with normal kidney function, proteinuria is associated in a continuous fashion with an increased risk of these adverse outcomes, which is further amplified in the setting of reduced eGFR.

Although the incidence of ESRD shows signs of levelling off in most countries in the EU, perhaps in part because of increased awareness of CKD, ESRD is a major cost driver for health-care systems. Interventions targeting CKD, particularly to reduce urine protein excretion, are efficacious, cost-effective methods of improving cardiovascular and renal outcomes, especially when applied to high-risk groups (diabetics, elderly, hypertensives and presence of familial kidney diseases. Integration of these approaches within NCD programs could minimize the need for costly renal replacement therapy in the form of dialysis or transplanatation. Early detection and treatment of CKD can be implemented at minimal cost and will reduce the burden of ESRD, improve outcomes of diabetes and cardiovascular disease (including hypertension), and substantially reduce morbidity and mortality from other non-communicable diseases. Prevention of CKD should thus be considered in planning and implementation of European and national NCD policy.


### *Early detection for diabetes*

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Type 2 diabetes, the most prevalent form of the disease, is often asymptomatic in its early stages and can remain undiagnosed for many years**.**

The chronic hyperglycemia of diabetes is associated with long-term dysfunction, damage, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels. Often the patients experience a diagnose-free interval with hyperglycaemia which can last more than 10 years were the leasion for the diabetes associated complications progress.

Individuals with undiagnosed type 2 diabetes are also at significantly higher risk for stroke, coronary heart disease, and peripheral vascular disease than the nondiabetic population. They also have a greater likelihood of having dyslipidemia, hypertension, and obesity. Because early detection and prompt treatment may reduce the burden of diabetes and its complications, screening for diabetes may be appropriate under certain circumstances. Recent studies indicate that the early detection of diabetes symptoms and treatment can decrease the chance of developing the complications of diabetes.

The onset of type 1 diabetes is usually sudden and dramatic while the symptoms can often be mild or absent in people with type 2 diabetes, making this type of diabetes gradual in onset and hard to detect.

At present, type 1 diabetes cannot be prevented. The environmental triggers that are thought to generate the process that results in the destruction of the body's insulin-producing cells are still under investigation. Type 2 diabetes, however, can be prevented in many cases by maintaining a healthy weight and being physically active. Studies in China, Finland and the United States have confirmed this.

According to the latest figures released by the 3$^{rd}$ edition of the Policy Puzzle, 52,8 million people in Europe have diabetes (representing 8.1% of the adult population) and these figures are expected further rise to 64 million (i.e. 9.5% of the adult population by 2030). The risk of developing type 2 diabetes increases with age, obesity, and lack of physical activity. Type 2 diabetes is more common in individuals with a family history of the disease and in members of certain racial/ethnic groups. It occurs more frequently in women with prior gestational diabetes (GDM) or polycystic ovary syndrome and in individuals with hypertension, dyslipidemia, impaired glucose tolerance (IGT), or impaired fasting glucose (IFG).

The International Diabetes Federation (IDF) recommends that all people at high risk of developing type 2 diabetes be identified through opportunistic self-screening. Such high risk groups can be easily identified through a simple questionnaire to assess risk factors such as age, waist circumference, family history, cardiovascular history and gestational history.

Once identified, people at high risk of diabetes should have their plasma glucose levels measured by a health professional to detect Impaired Fasting Glucose or Impaired Glucose Tolerance, both of which indicate an increased risk of type 2 diabetes. Prevention efforts should target those at risk in order to delay or avoid the onset of type 2 diabetes.

To obtain the best glycaemic control and minimise the risks of the secondary complications, it is crucial that people with diabetes receive individualised education in all aspects of their care, from diet, medication and appropriate self-monitoring of blood glucose to life style and physical activity. Diabetes educators, doctors, trained diabetes nurses and other health care professionals all have an important role in supporting individualised therapeutic self management and education sustained throughout the lifetime of the individual.

There is substantial evidence that achieving a healthy body weight and moderate physical activity can help prevent the development of type 2 diabetes. In primary prevention there is an important role for the interdisciplinary diabetes team to help people understand their individuals risks and set realistic goals to improve and maintain health. IDF recommends a goal of at least 30 minutes of daily exercise, such as brisk walking, swimming, cycling or dancing – which has been shown to reduce the risk of type 2 diabetes by 35-40%.

Based on available data, the cost burden of diabetes and its complications in Europe is significant and growing. In many countries, diabetes is responsible for more than 10% of total healthcare spending. Current estimates of the cost of diabetes are, however, considered to be underestimates – especially due to the lack of consideration for both direct and indirect costs associated with the disease and its extremely expensive complications, such as stroke, myocardial infarction, amputation, blindness and end-stage kidney disease.

The absence of reliable data remains a barrier to assessing the true cost burden of diabetes on individuals, healthcare systems and economies in Europe. It also prevents governments from assessing the impact and effectiveness of national diabetes policies and programmes.

## *Early detection of liver disease*

Depending on the stage at which it is diagnosed, liver disease covers

- Fatty liver - a range of conditions where there is a build-up of fat in the liver cells. It is caused by certain chemical compounds (particularly alcohol) and by nutritional and endocrine disorders.

- Hepatitis - the most common liver disease which causes inflammation of the liver. It can occur in both viral (e.g. Hepatitis A, B, C, D, E) and non-viral forms (e.g. alcoholic and autoimmune hepatitis) and may result in an acute or chronic condition.

- Cirrhosis – the excessive development of scar tissue within the liver which can lead to complete liver failure. This is the result of long-term, continuous damage to the organ.
- Liver cancer - may occur as both primary (cancer that starts in the liver) and secondary (cancer that first develops elsewhere in the body and then spreads to the liver)

- Genetic diseases – includes conditions such as Haemochromatosis, Wilson's Disease and Glibert's Syndrome. These diseases are rare (with a prevalence of less than 50 per 100,000 people).

In addition to viral hepatitis, obesity, diabetes and excessive alcohol intake are the main causes for liver disease. Regardless of the cause liver disease is estimated to affect 6% of the EU's population (approx. 29 million people) and is reported to be the EU's 5th biggest killer, accounting for at least one in six deaths. Despite such alarming statistics, liver disease is still widely neglected by the EU.

Severe diseases, such as liver cirrhosis, are growing at an alarming rate and strike younger people than in the past. For instance, in England there has been a tenfold increase among women aged 35-44 dying from this disease over the last 30 years. (Institute of Alcohol Studies UK 'Alcohol Consumption and Harm in the UK and EU').

A national study carried out in Portugal showed that 3.8% of deaths were attributable to alcohol. Considering the sum of deaths and disability, liver disease represented the main source of the burden attributable to alcohol. The cost of illness incurred amounted to €95.1 millions are attributable to alcohol-related disease admissions (liver diseases, cancer, traffic accidents, and external causes) while the ambulatory costs of alcohol-related diseases were estimated in €95.9 million, totalling €191.0 million direct costs, representing 0.13% of Gross Domestic Product and 1.25% of total national health expenditures. (The Burden of Disease and the Cost of Illness Attributable to Alcohol Drinking—Results of a National Study, Helena Cortez-Pinto, Miguel Gouveia, Luís Dos Santos Pinheiro, João Costa, Margarida Borges, António Vaz Carneiro, 2010).

# Screening and early interventions in chronic diseases

## *Cancer screening*
From the point of view of public health, the following cancer prevention programmes would qualify as examples of successful secondary prevention measures:

1) Breast cancer: Screening mammography:
   a. Bi-annual mammography screening programmes for the early detection and raising of cure rates for breast cancer in women between 50-70 years of age
   b. Tailor-made screening for women at familial cancer risk

2) Mass Screening for Cervical Cancer and HPV in sexually active young females (>25 years) for the early detection of and raising cure rates in cervical cancer.

3) Large bowel cancer:
   a. Mass Screening with iFOB-Testing for the early detection and raising of cure-rates
   b. Screening in high risk families: guidelines for active surveillance have been developed; patients with a potential family history are nowadays identified by special search of histological specimens (MSI?)
   c. Active surveillance of patients with colo-rectal cancer.

## *Spirometry*
Spirometry is the most reproducible and objective measurement of airflow limitation available. Spirometry enables the primary care health professional to make an objective measurement of airflow limitation and the degree to which it is reversible, and is an important tool for accurate diagnosis and effective management of chronic respiratory diseases including asthma and COPD. However, spirometry remains underused in primary care. Barriers to performing spirometry in community settings include lack of access to calibrated spirometers, inadequate training in performing spirometry, price of conventional spirometers, lack of quality-control systems to ensure accurate results, and inadequate interpretation skills among health professionals performing the test. Despite these barriers, early detection of COPD appears to be feasible through offering spirometry to adults with tobacco/occupational exposure and at least 1 respiratory symptom.[1]

Having a simple screening tool adapted to the primary care setting that would detect diseases in early stages would reduce the number of patient referrals. This would result in fewer later stage cases of disease and consequently, better quality of life for patients, and help savings for the healthcare burden.

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[1] Ulrik CS  et al. Early detection of COPD in general practice. *Int J Chron Obstruct Pulmon Dis.* 2011;6:123-7.

### Smoking cessation

Smoking cessation is one of the one of the most important ways to improve the prognosis of patients with respiratory disease.[2] More effort should be put into cessation programmes if there is any prospect of preventing the predicted rise in chronic respiratory disease.[3] These programmes are cheap and highly cost-effective especially in the context of chronic respiratory diseases.[4] The recent Conference of the Parties (COP4) to the WHO FCTC decided to issue excellent guidelines on how the parties could encourage smoking cessation, ranging from making the recording of tobacco use in medical notes mandatory to the development and dissemination of comprehensive guidelines and addressing tobacco use by healthcare workers and others involved in smoking cessation.

As a result of the very large number of patients that will be suffering from chronic respiratory diseases such as COPD, more diagnosis and management is needed in general practice and among general physicians. An internal "leadership" survey was conducted by the European Respiratory Society (ERS) in 2009–2010 among its members[5]. An overwhelming majority of those interviewed (93%) believe it is their responsibility to advise their patients about smoking cessation, yet just 39% have had formal training on smoking cessation approaches. Gaps such as these will need to be addressed in future also at the level of post-graduate medical education.

### Early diagnosis of diabetes

An early diagnosis of hyperglycemia and diabetes mellitus is the key for optimal chronic care management and crucial for the prevention of diabetes associated complications. Patients with diabetes mellitus experience diagnose free intervals from sometimes more than 10 years and during this period the lesions for the late complications are generated. An early diagnosis can reduce these diagnose-free intervals and by this the most effective procedure for the prevention of late complications. An adequate diabetes diagnosis can be performed in fasting conditions, by measuring fasting glycaemia as basis and optimal measuring also 2-h glucose value with an oral glucose tolerance test or postmeal glucose.

Due to the high number of people with undiagnosed diabetes, a high number of diabetes diagnosis is missed if the focus is only onto clinical diagnosis. Therefore screening procedures by using population adjusted risk scores are recommended and in those, where an increased diabetes risk is identified as a second step, a clinical test should be performed. Furthermore, American guidelines as well as a growing number of guidelines worldwide recommend using the HbA1c for diagnosis, which presents some advantages, but cannot replace the quality of a clinical diagnosis.

Due to the fast growing number of patients with diabetes mellitus and the number of undiagnosed patients, actions for adequate screening and early diagnosis of diabetes are needed. They can be an efficient tool to reduce the burden of associated complications. Structured and standardised screening programs by using a 2-step-procedure and including a patient self assessment by risk scores followed by

[2]Tønnesen P et al. Smoking cessation in patients with respiratory diseases: a high priority, integral component of therapy. *Eur Respir J* 2007, 29**(2):**390-417.

[3] Oberg M, Jaakkola MS, Woodward A, et al. Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. Lancet 2011; **377**: 139–146.

[4] Hoogendoorn M, Feenstra TL, Hoogenveen RT, et al. Long-term effectiveness and cost-effectiveness of smoking cessation interventions in patients with COPD. Thorax 2010; 65: 711–718.

[5] Z. Kabir, B. Ward and L. Clancy on behalf of the Tobacco Control Committee of the European Respiratory Society Attitudes, training and smoking profile of European Respiratory Society members, ERJ, volume 38, pg-225-227

a clinical test in high risk subjects are recommended. Criteria for the definition of diabetes diagnosis have to be clearly communicated. The use of oral glucose tolerance test is a gold standard, but can be replaced to increase efficiency and efficacy of the screening by the measurement of postmeal glucose, HbA1c and fasting glycaemia. Programs for screening of undiagnosed diabetes should be implemented in regular clinical and ambulatory care and should be offered to persons above the age of 35 years, if additional risk factors are present and above 45 years of age continuously.

## *Early diagnosis of Liver Disease*

With the increasing prevalence of liver cirrhosis and liver cancer in Europe, caused by excessive and chronic alcohol consumption it is important to put forward evidence-based solutions that will contribute to tackling the problem. Harmful alcohol consumption is now recognised as the 3rd largest cause of early death and illness in the EU, just behind tobacco and high blood pressure.[6]

The following suggested interventions to ensure a reduction in harmful alcohol and, as a result, in liver disease, are recommended:

- Active and effective surveillance system to monitor the prevalence of alcohol-related liver disease and mortality.

- High profile, sustained health information and education campaigns to convey the importance of a healthy liver and the dangers of excessive alcohol consumption, particularly in school and university environments.

- Professional education and training campaigns targeted at primary and secondary care medical, nursing and associated professionals, as well as social workers and teachers to promote the early recognition of alcohol misuse.

- Introduction of health warnings on all alcoholic beverages, as is already the case in some Member States

- Brief interventions to assess the extent of alcohol consumption and, if cause for concern, the monitoring and follow up as well as

Sedentary lifestyles and diets high in fat and sugar are leading to a high prevalence of obesity, which in turn increases the risk of developing a form of liver disease called 'Non-alcoholic fatty liver disease' (NAFLD).

NAFLD, which is estimated to affect 10-24% of the world's population, includes a range of liver diseases from the most common, 'fatty liver' (accumulation of fat in the liver), to 'Non-alcoholic steatohepatitis' (NASH, fat in the liver causing liver inflammation), to 'cirrhosis' (irreversible, advanced scarring of the liver as a result of chronic inflammation of the liver).

Doctors and public health officials project that obesity-related liver diseases (NAFLD, cirrhosis and liver cancer) will become the leading cause of liver failure and liver transplantation in the near future.

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[6] http://ec.europa.eu/health/ph_determinants/life_style/alcohol_factsheet_en.pdf

The European Association for the Study of the Liver (EASL) recommends that the EU:

- Recognise obesity as a leading cause of chronic liver disease.
- Promote data gathering through the monitoring, reporting and surveillance of obesity trends as well as its correlation to liver disease incidence in order to improve our knowledge on these subjects
- Strengthen policy initiatives in major chronic diseases which are linked to obesity.
- Further develop soft-law measures and tools that are capable of translating the ambitions stated by the institutions and the Obesity Platform into monitored and measurable results at the EU and national level.
- Raise public awareness on the correlation between ill-nutrition, obesity and liver disease amongst European citizens. In this respect, it should avoid ad hoc events and ensure proper follow-up and coherent coordination of campaigns at national level.