

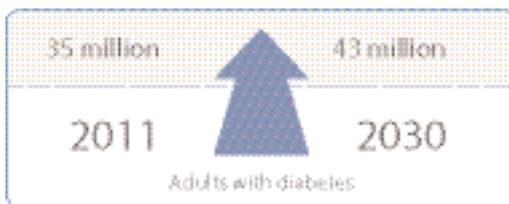
Italian Health Policy Brief

Diabetes in Europe: A Roadmap

Foreword

About 35 million people, corresponding to 6.2% of the adult population in Europe, had diabetes in 2011. Unless prompt action is taken estimates show that this number could increase by 23%, reaching an alarming 43 million by 2030 (figure 1).

Figure 1



Recent estimates by the International Diabetes Federation (IDF) show that the prevalence of diabetes in several European countries is as follows (see table):

Denmark	5.7%	France	5.6%
Germany	5.5%	Israel	7.6%
Italy	5.3%	Holland	5.4%
Poland	9.2%	Spain	6.5%
Turkey	8.1%	U.K.	5.4%

These figures might be an underestimation.

The data available today tell us that 89 billion euros were spent on treating and managing diabetes and its related complications in 2011.

However, the true cost of diabetes also includes indirect costs, such as productivity loss, which can dramatically increase the costs associated with the disease.

The IDF estimates suggest trouble ahead for the European healthcare systems, with economic consequences that will be difficult to address.

Furthermore, delays in diagnosis and treatment deficiencies might make diabetes-related complications more likely and will inevitably increase healthcare costs in the future. Chronic diseases like diabetes can reduce a household's income, which, in a time of financial hardship like the present, can lead to the risk of increasing social inequality and poverty.

In the overall economy, this can have a negative impact on the gross domestic product (GDP), as well as bring about severe consequences in absolute economic terms.

Diabetes in Europe: A Diverse Picture

Although rates of premature death from cardiovascular disease have decreased in western Europe, they vary greatly within the region, with the highest rates found in eastern European countries.

Furthermore, there is a significant differ-

ence in life expectancy across Europe, highlighting the fact that European countries are at very different stages in terms of formulating strategies and responding to the challenge posed by chronic diseases.

Despite having the benefit of some of the most developed healthcare systems in the world, in many parts of Europe there are currently large variations in the availability and measurement of data with regard to diabetes prevalence and costs.

IDF estimates concerning the number of people with diabetes and the levels of current healthcare spending attributable to diabetes vary noticeably from country to country in Europe, thus reflecting issues that exist on a local level.

For instance:

- The estimated prevalence of diabetes varies from 2.8% in Albania to 9.8% in Portugal;
- Estimated healthcare spending due to diabetes ranges from 312 euros per person in the Republic of Macedonia to 6,896 euros per person in Norway.

The large differences in the prevalence and costs associated with diabetes are due to a

number of factors, including differences between countries in terms of healthcare systems, treatment and management costs, technology and lifestyles.

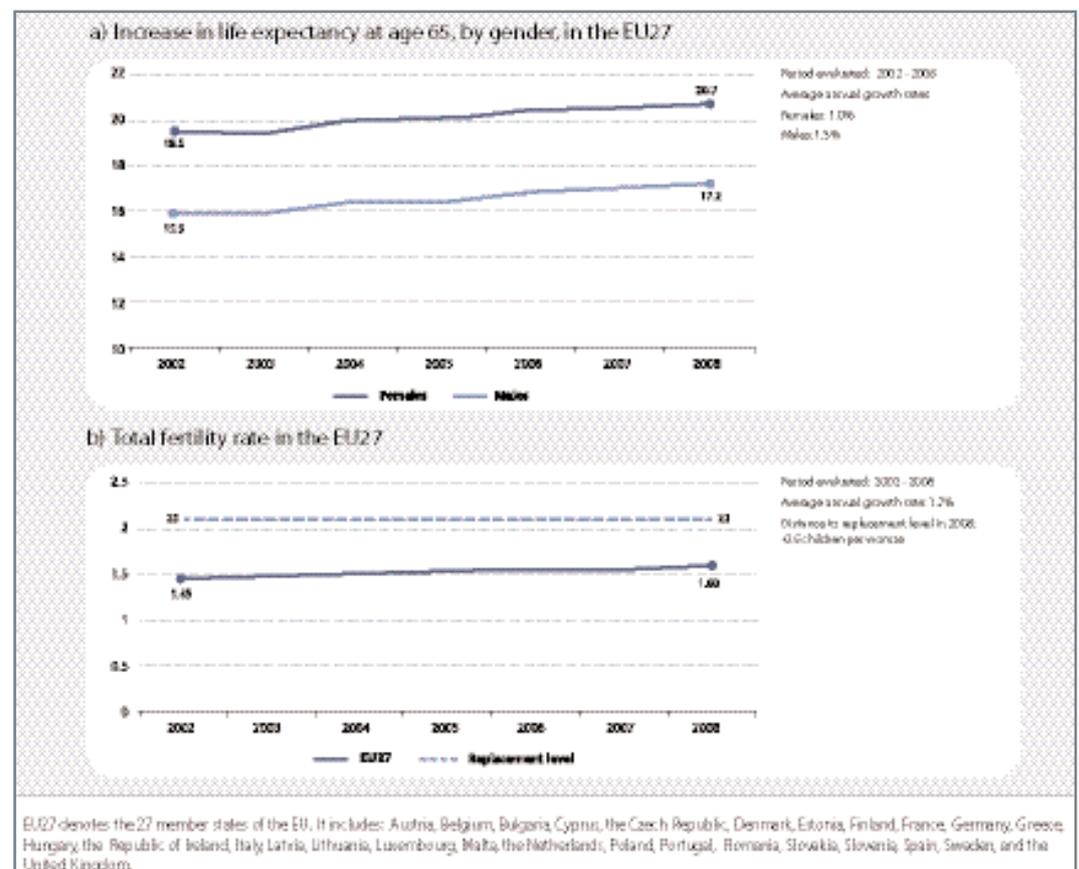
What are the challenges involved in changing the future of diabetes in Europe?

During the last 50 years, economic and technological improvements, together with the introduction of more effective drugs, have increased life expectancy in Europe (figure 2).

The ageing of the population is one of the risk factors for developing type 2 diabetes and chronic diseases in general. Chronic conditions are possibly connected to comorbidities in ageing populations, as the number of people in western Europe over the age of 64 has more than doubled, and the number of people over 80 has quadrupled over the last few decades.

For example, in Denmark an estimated 40% of the population already live with at least one long-term condition. This poses a great challenge not only to healthcare systems, but also to society and economy as a whole.

Figure 2



It has been estimated that the ratio of elderly and economically inactive people (> 65 years) to people of working age in the EU will double between 2005 and 2050, with serious consequences on the welfare systems of all countries.

As a result, the quality of healthcare could suffer as fewer people must cover the increasing costs of healthcare. Governments must hasten and carry out substantial reforms, implementing again benchmarking and analysis models before financial problems caused by the demographic change associated with an ageing population strangle the socio-economic and healthcare systems. A further challenge will be posed by immigration, which is another factor that can directly impact chronic disease and have broad repercussions on national healthcare systems. In fact, in the European population the role of ethnicity is well documented, as type 2 diabetes is up to six times more common among people of South Asian descent and up to three times more common among those of African and African-Caribbean origin.

Regular exercise and healthy diet, strategies aimed at preventing and combating obesity, access to care and care uniformity across healthcare systems are, therefore, priority goals that require action.

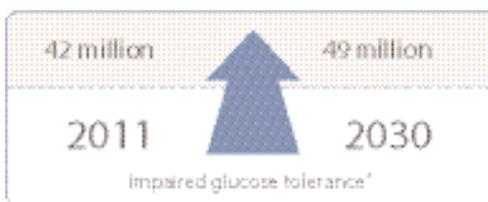
- As the population in Europe gets older and life expectancy increases, there will be more people with type 2 diabetes and other chronic diseases;
- Obesogenic working and social environments, combined with unhealthy eating habits and physical inactivity, have serious implications for type 2 diabetes and other chronic diseases;
- There is an uneven distribution of chronic disease, with a higher prevalence among the poor and vulnerable, as well as certain ethnic groups.

Taking Immediate Action

In 2011, the IDF estimated that 42 million people in Europe, representing 9.5% of the total European population, had impaired

glucose tolerance. This number is projected to increase by 15% to 49 million by the year 2030 (Figure 3).

Figure 3



Early detection and adequate intervention are an opportunity to improve the clinical outcomes of people with type 2 diabetes and other chronic diseases. Early diagnosis and treatment can therefore become a healthcare strategy at both a European and national level, in order to decrease costs associated with complications and the productivity loss of people with type 2 diabetes.

From Political Debate to Action

The international will to address the threat of diabetes has been expressed in a number of major declarations and specific plans concerning the disease. Among the earliest is the 1989 St. Vincent Declaration, which was supported by the WHO's regional office for Europe (WHO/Europe).

Since the adoption of the St. Vincent Declaration in 1989 – a milestone in the development of political strategies against diabetes at an international level – diabetes has enjoyed growing attention from international institutions and national governments, thus becoming a priority. Nevertheless, most countries have not yet adopted effective measures to stem the diabetes epidemic in Europe.

At an international level, after 1989 a number of legal and policy initiatives have been implemented to encourage individual countries to adopt specific diabetes plans, such as:

1. The European Parliament Written Declaration on Diabetes (January 2006);
2. The EU Council Conclusions on the promotion of healthy lifestyles and pre-

- vention of type 2 diabetes (June 2006);
3. The UN Resolution on diabetes 61/225 (December 2006).

In December 2010, the EU Council adopted conclusions that called for the European Commission to initiate a reflection process, involving both EU member states and civil society, that is aimed at identifying options with which to optimise the response to the challenges of chronic diseases.

This process is due to end in late 2012 or early 2013 and will result in a specific report on diabetes in Europe. Additionally, in September 2011 the European Parliament adopted a resolution that stresses the importance of the prevention and control of Non-Communicable Chronic Diseases (NCDs).

In September 2011, heads of state and government leaders attended a UN high-level meeting in New York on NCDs, where delegates voted and unanimously adopted a political declaration that calls for a united campaign by governments, the private sector and civil society to synergically address this global health issue.

Finally, in March 2012 the European Parliament adopted a Resolution on Addressing the EU Diabetes Epidemic which calls for a range of initiatives to improve the prevention, detection and management of diabetes, as well as encourage member states to adopt national diabetes plans.

During the first six months of 2012, Denmark holds the Presidency of the Council of the EU. The Danish EU Presidency has identified chronic diseases as one of the key health priorities, with diabetes the model disease. This represents a unique opportunity for further collaboration between politicians, governments, Ministries of Health, patient organisations and the private sector with regard to the urgency of improving prevention, early detection and quality of care in Europe.

All of this has given rise to a wide debate, that has then yielded to the Copenhagen Roadmap.

Copenhagen Roadmap Outcomes of the European Diabetes Leadership Forum

Foreword

In a time of financial crisis, an ageing population and a growing burden of chronic diseases such as diabetes, societies across Europe and their healthcare systems are under great pressure.

In recent years much political attention has been given to diabetes and other chronic diseases, resulting in initiatives such as the *United Nations (UN) Resolution on Diabetes 61/225*; the *“European Coalition for Diabetes Grand Challenge: Delivering for Diabetes in Europe”* document; the *Political Declaration of the 2011 UN High Level Meeting on the Prevention and Control of Non-Communicable Diseases (NCDs)*; the *European Parliament resolution of 14 March 2012 on addressing the EU diabetes epidemic*; and *Council Conclusions* from previous European Union presidencies addressing the issue, including Austria, Belgium and most recently Poland. We must build on these and turn policy into action by outlining concrete initiatives which can form part of National Diabetes Programmes to improve the lives of people with diabetes. The European Diabetes Leadership Forum took place on 25th and 26th April 2012 in Copenhagen, during the Danish Presidency of the Council of the European Union. The Forum gathered a variety of leading experts, policymakers, industry, NGO's and healthcare professionals to promote concrete and workable initiatives. The outcomes of the European Diabetes Leadership Forum have been collected in this Copenhagen Roadmap, a document which aims to inspire stakeholders who are working to improve diabetes and chronic disease care across Europe.

High-quality research on diabetes will help to provide the evidence base to assess these initiatives and thus will contribute to better prevention, early detection as well as better management and control of diabetes.

Prevention

Type 2 diabetes is a largely preventable disease. Risk factors include overweight and

obesity, an unhealthy diet and lack of physical activity. Promoting and facilitating a healthy lifestyle can prevent or delay the onset of type 2 diabetes, and is particularly effective when targeting those at high-risk as well as children, pregnant women, ethnic minorities and vulnerable groups. Central and local governments, including municipalities, the private sector, as well as non-governmental organisations all have a role to play.

Use a cross-sectoral approach to promote healthy behaviour and create an environment enabling healthy lifestyle

- Raise awareness of type 2 diabetes and its risk factors through health promotion. Encourage healthy lifestyles with physical activity and a balanced diet, including healthy nutritious food with less sugar, salt and saturated fats
- Make healthy choices attractive and affordable. Incorporate prevention of type 2 diabetes and its risk factors in relevant legislation and policy, including taxation, food labelling and advertising restrictions, for example towards children
- Encourage healthy cities through urban design. Incorporate opportunities for physical activity in the infrastructure, for example by developing cycling routes and outdoor exercise areas
- Use the workplace environment as an opportunity to promote healthy behaviour and ensure that employee health is embedded in the employer's policies and practices. Prioritise a healthy food selection, establish access to physical activity and offer support to healthy lifestyles Improve the health of pregnant women, infants and children
- Raise awareness of pre-natal health, effects of overweight and gestational diabetes mellitus (GDM). Improve pre-natal care including dietary advice, and consider early detection of GDM, intervention and follow-up, as well as promotion of breastfeeding
- Use schools as platforms for promoting a healthy lifestyle. Improve health literacy, facilitate access to healthy foods in canteens, and encourage physical activity Implement prevention initiatives in

vulnerable and high-risk populations

- Educate healthcare professionals, including diabetes specialist nurses, to assess and systematically target high-risk groups, raising awareness of practical steps towards lifestyle modification and healthy lifestyle choices
- Target vulnerable populations, such as the economically disadvantaged or ethnic minorities susceptible to type 2 diabetes. Establish awareness of risk factors for type 2 diabetes and encourage a healthy lifestyle, for example through communitybased interventions

Early detection and intervention

Early detection and early intervention decrease the risk of complications. They provide a window of opportunity for action, which can improve the individual outlook and has the potential to decrease the economic burden on healthcare systems and society.

Use national type 2 diabetes risk questionnaires

- Adapt validated type 2 diabetes and cardiovascular disease risk questionnaires to a given national context so they provide a reliable estimate of the respondent risk level based on the answers to simple questions on personal and lifestyle characteristics
- Disseminate the risk questionnaires through primary care, community and workplace platforms. Risk questionnaires can motivate individuals to make healthy choices and may also facilitate targeted health checks Design and implement a programme of targeted health checks
- Design health check programmes targeting high-risk populations to secure cost-effective early detection of type 2 diabetes and cardiovascular disease. Include assessment of overall health and measurement of blood pressure, cholesterol and blood glucose
- Implement targeted evidence-based (systematic or opportunistic) health check programmes in primary care, community or workplace contexts. Encourage risk groups to attend health

checks Ensure that intervention is provided as soon as appropriate

- Provide support, including diet and exercise programmes and lifestyle guidance, to those at high risk of developing type 2 diabetes and other chronic diseases
- Ensure early intervention for those detected with increased levels of blood glucose, indicating pre-diabetes or diabetes, in order to bring people into optimal control early on

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Better management and control

People with well-controlled type 1 and type 2 diabetes will have better long-term outcomes. A people-centred approach that seeks to improve the entire diabetes pathway will keep people healthy and delay complications and co-morbidities for as long as possible. This will require a coordinated approach involving primary, secondary, tertiary care and the social sector, with the individual at the centre.

Deliver coordinated and high-quality care

responses to address the needs of people living with diabetes

- Ensure that health care professionals are trained to respond adequately to the needs of people with diabetes and other chronic diseases. All nurses should be trained in chronic disease management
- Adopt a life course approach and create coordinated responses, mainly anchored in primary care, that support people with multiple morbidities, for example by designing Disease Management Programmes and encouraging medical teams to coordinate
- Ensure access to safe and effective treatments (including treatment combinations and best treatment pathways) which improve control, reduce long-term complications and prevent hospitalisation
- Increase awareness of the importance of adherence to treatment

Empower patients through people-centred chronic care models

- Implement evidence-based guidelines for people-centred chronic care with a particular focus on individual needs assessment and target setting as well as patient empowerment
- Provide diabetes self-management education at relevant stages. Involve relevant professionals to educate and help individuals manage their condition(s). Promote patient empowerment through activities driven by civil society organisations and patient associations
- Promote and support the uptake of proven cost-effective tools and strategies, including telemedicine and e-health
- Improve equity of access and health outcomes by tailoring support to individual needs and by ensuring equal rights for people with diabetes

Capture data to inform and drive decision making

- Collect data – including diabetes prevalence, outcomes, and costs – for example by using population-based national registries and surveys (including general practitioners' and hospital discharge databases)

The Copenhagen Roadmap clearly shows that diabetes can be effectively prevented and defeated in all European countries by implementing strategies and synergies aimed at:

- Ensuring universal access to a healthy diet and promoting daily exercise at all ages and in all environments
- Considering education and self-management to be an essential pivot and making them accessible to everybody with diabetes
- Monitoring, assessing, and circulating the results at a regional, national, and international level
- Addressing diabetes not only from a clinical point of view, but also from a political, economic, and social perspective, by focusing on prevention and early detection and treatment
- Establishing concrete synergies between policy-makers, scientific societies, experts, patients associations and the industry, in order to identify effective and sustainable solutions

Comments on the implementation of the Copenhagen Roadmap in the Italian context

The principles outlined by the Copenhagen Roadmap can be fully implemented in Italy by enhancing the role played by diabetes centers in the care of people with diabetes. The Italian diabetes network is certainly one of the most advanced in the world. The clinical, social, and economic outcomes – extensively documented in the international literature – demonstrate Italy's excellence regarding the care of people of diabetes, which needs to be safeguarded at a policy and planning level.

In order to attain this goal, it is necessary to promote, within the national and regional programs on diabetes, a strategic pathway concerning the approach to this disease, taking into account not only the functional aspects but also those pertaining to facilities and organisation.

Diabetes can be considered a model disease for other chronic diseases; it shares risk factors with many other chronic diseases, a large proportion of people with type 2 diabetes have multiple chronic diseases, and interventions proven effective within diabetes are often replicable to other chronic diseases.

Based on the link between diabetes and other chronic diseases we encourage the priority areas outlined in the Copenhagen Roadmap to serve as inspiration for action frameworks within other chronic disease areas as well.

Authorship of the Copenhagen Roadmap lies with multiple stakeholders. The hosts and partners to the European Diabetes Leadership Forum developed the foundation of the Copenhagen Roadmap, and contributions to the content were made by speakers, panellists and participants who attended the Forum. As a result of the collaborative effort, no organisation or individual should be made independently responsible for the Copenhagen Roadmap.

The European Diabetes Leadership Forum was hosted by the OECD and the Danish Diabetes Association and held under the auspices of the Danish Presidency of the Council of the European Union and the Danish Ministry of Health. Partners to the European Diabetes Leadership Forum were the European Association for the Study of Diabetes (EASD), the International Diabetes Federation European region (IDF Europe), the Foundation of European Nurses in Diabetes (FEND), Primary Care Diabetes Europe (PCDE) and Steno Diabetes Center. The European Diabetes Leadership Forum was endorsed by Business and Industry Advisory Committee to the OECD (BIAC), International Hospital Federation (IHF), International Social Security Association (ISSA), Assembly of European Regions (AER), HIMMS Europe, Pharmaceutical Group of the European Union (PGEU), SHE network, Danish Committee of Health Education. The Forum was supported by Novo Nordisk.

Download the Copenhagen Roadmap and learn more about the European Diabetes Leadership Forum by visiting diabetesleadershipforum.eu

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References

1. Beaglehole R, Bonita R, Horton R et al.; for The Lancet NCD Action Group and the NCD Alliance. Priority actions for the non-communicable disease crisis. *Lancet* 2011; 377:1438-1447.
2. World Health Organization. Global burden of disease. 2012. Available from: http://www.who.int/topics/global_burden_of_disease/en/ (accessed 6 March 2012)
3. World Health Organization. Global burden of disease. Preventing chronic diseases: a vital investment. 2005. Available from: http://www.who.int/chpchronic_disease_report/full_report.pdf (accessed 6 March 2005)
4. World Health Organization. Gaining Health: The European Strategy for the Prevention and Control of Noncommunicable Diseases. 2006. Available from: http://www.euro.who.int/___data/assets/pdf_file/0008/76526/E89306.pdf (accessed 6 March 2012).
5. Gaede P, Vedel P, Larsen N et al. Multifactorial intervention and cardiovascular disease in patients with type 2 diabetes. *New England Journal of Medicine* 2003; 348:383-393.
6. United Nations. General Assembly. Political declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Noncommunicable Diseases. 2011. Available from: <http://www.un.org/en/ga/ncdmeeting2011/> (accessed 6 March 2012).
7. World Health Organization. First Global Ministerial Conference on Healthy Lifestyles and Noncommunicable Disease Control. Discussion paper: Prevention and control of NCDs: priorities for investment. 2011. Available from: http://www.who.int/nmh/publications/who_bestbuys_to_prevent_ncds.pdf (accessed 6 March 2012).
8. United Nations. High-level Meeting on Non-communicable Diseases. 2011. Available from: <http://www.un.org/en/ga/president/65/issues/ncdiseases.shtml> (accessed 6 March 2012).
9. Lindström J, Neumann A, Sheppard KE et al.; on behalf of the IMAGE Study Group. Take action to prevent diabetes - the IMAGE toolkit for the prevention of type 2 diabetes in Europe. *Hormone and Metabolic Research* 2010; 42:S37-S57.
10. Tuomilehto J, Lindström J, Eriksson JG et al. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *New England Journal of Medicine* 2001; 344:1343-1350.
11. Knowler W, Barrett-Connor E, Fowler S et al.; Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Eng J Med* 2002;346[6]:393-403.
12. Lindström J, Ilanne-Parikka P, Peltonen M et al.; on behalf of the Finnish Diabetes Prevention Study Group. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: the follow-up results of the Finnish Diabetes Prevention Study. *Lancet* 2006; 368:1673-1679.
13. Paulweber B, Valensi P, Lindström J et al.; for the Writing Group on behalf of the IMAGE Study Group. A European evidence-based guideline for the prevention of type 2 diabetes. *Hormone and Metabolic Research* 2010; 42:S3-S37.
14. Organisation for Economic Co-operation and Development. OECD Health Ministerial Meeting, Session 2: Healthy Choices. 2010. Available from: <http://www.oecd.org/dataoecd/14/13/46098333.pdf> (accessed 6 March 2012).
15. Alberti KGMM, Zimmet P & Shaw J. International Diabetes Federation: a consensus on type 2 diabetes prevention. *Diabetic Medicine* 2007;24:451-463.
16. International Diabetes Federation. Global Diabetes Plan 2011-2021. 2011. Available from: <http://www.idf.org/global-diabetes-plan-2011-2021> (accessed 6 March 2012).
17. International Diabetes Federation. IDF Diabetes Atlas, 5th ed. Brussels, Belgium: International Diabetes Federation, 2011.
18. Busse R, Bl, mel M & Scheller-Kreinsen D. Tackling chronic disease in Europe: strategies, interventions and challenges. 2010. Available from: http://www.euro.who.int/___data/assets/pdf_file/0008/96632/E93736.pdf (accessed 6 March 2012).
19. International Diabetes Federation. A Call to Action on Diabetes. 2010. Available from: <http://www.idf.org/webdata/Call-to-Action-on-Diabetes.pdf> (accessed 6 March 2012).
20. Tal på diabetes 1996-2010, Sundhedsstyrelsen 2011.
21. Green, A.: Diabetes Mellitus i Danmark 1997-2006. Epidemiologiske Analyser
22. European Commission. Sustainable development in the European Union. 2011. Available from: http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p__product_code=KS-31-11-224 (accessed 6 March 2012).
23. Davis TM. Ethnic diversity in type 2 diabetes.

- Diabet Med 2008; 25(Suppl. 2): 52-56.
24. World Health Organization. Adherence to long-term therapies: Evidence for action. 2003 Available from: "http://whqlibdoc.who.int/"http://whqlibdoc.who.int/publications/2003/9241545992.pdf (accessed 6 March 2012).
 25. Varo JJ, Martinez-Gonzalez MA, Irala-Estévez J et al. Distribution and determinants of sedentary lifestyles in the European Union. *International Journal of Epidemiology* 2003; 32:138-146.
 26. World Health Assembly. WHO global strategy on diet, physical activity and health. 2004. Available from: http://www.who.int/dietphysicalactivity/strategy/eb11344/strategy_english_web.pdf (accessed 6 March 2012).
 27. Elmadfa I & Freisling H. Nutritional status in Europe: methods and results. *Nutrition Reviews* 2009; 67 (Suppl. 1) :S130-S134.
 28. Schwarz PE, Greaves CJ, Lindström J et al. Nonpharmacological interventions for the prevention of type 2 diabetes mellitus. *Nature Reviews Endocrinology* 2012; doi:10.1038/nrendo.2011.232.
 29. Malnick S, Knobler H. The Medical Complications of Obesity. *QJM* 2006; 99[9]:565-579.
 30. Abdullah A, Peeters A, de Courten M et al. The magnitude of association between overweight and obesity and the risk of diabetes: a meta-analysis of prospective cohort studies. *Diabetes Research and Clinical Practice* 2010; 89:309-319.
 31. Organisation for Economic Co-operation and Development. Obesity and the Economics of Prevention. Available from: <http://dx.doi.org/10.1787/9789264084865-en/content/book/9789264084865-en> (accessed 6 March 2012).
 32. International Obesity Task Force. EU Platform Briefing Paper. 2005. Available from: http://ec.europa.eu/health/ph_determinants/life_style/nutrition/documents/iotf_en.pdf (accessed 6 March 2012).
 33. World Health Organization. Waist Circumference and Waist-Hip Ratio: Report of a WHO Expert Consultation. 2008. Available from: http://whqlibdoc.who.int/publications/2011/9789241501491_eng.pdf (accessed 6 March 2012).
 34. Vazquez G, Duval S, Jacobs DR et al. Comparison of body mass index, waist circumference, and waist/hip ratio in predicting incident diabetes: a metaanalysis. *Epidemiologic Reviews* 2007; 29:115-128.
 35. Mackenbach JP. Health inequalities: Europe in profile. 2006. Available from: http://ec.europa.eu/health/ph_determinants/socio_economics/documents/ev_060302_rd06_en.pdf (accessed 6 March 2012).
 36. Wilkinson R, Marmot M (eds). *Social Determinants of Health: the Solid Facts*. 2nd ed. Available from: http://www.euro.who.int/_data/assets/pdf_file/0005/98438/e81384.pdf (accessed 6 March 2012).
 37. Sheehy AM, Coursin DB, Gabbay RA et al. Back to Wilson and Jungner: 10 good reasons to screen for type 2 diabetes mellitus. *Mayo Clinic Proceedings* 2009; 84:38-42.
 38. American Diabetes Association. Standards of Medical Care in Diabetes. *Diabetes Care* 2005; 28(Suppl.):S4-S36.
 39. Holman R, Paul S, Bethel M et al. 10-year follow-up of intensive glucose control in type 2 diabetes. *N Engl J Med* 2008; 359:1577-1589
 40. Glumer C, Yuyun M, Griffin S et al. What determines the cost-effectiveness of diabetes screening? *Diabetologia* 2006; 49:1536-1544.
 41. Kahn R, Alperin P, Eddy D et al. Age at initiation and frequency of screening to detect type 2 diabetes: a cost-effectiveness analysis. *Lancet* 2010;375:1365-1374.
 42. Bailey CJ & Kodack M. Patient adherence to medication requirements for therapy of type 2 diabetes. *International Journal of Clinical Practice* 2011;653:314-322.
 43. Gherman A, Schnur J, Sassu R et al. How are adherent people more likely to think?: A meta-analysis of health beliefs and diabetes self-care. *Diabetes Educator* 2011; 373:392-408.
 44. Peyrot M & Rubin RR. Resistance to insulin therapy among patients and providers: results of the cross-national Diabetes Attitudes, Wishes, and Needs (DAWN) study - response to Phillipov and Phillips. *Diabetes Care* 2006; 29:953.
 45. International Diabetes Federation Clinical Guidelines Task Force. Global guideline for type 2 diabetes. 2005. Available from: <http://www.idf.org/webdata/docs/IDF%20GT2D.pdf> (accessed 6 March 2012).
 46. World Health Organization. *Innovative Care for Chronic Conditions: Building Blocks for Action*. 2002. Available from: <http://www.who.int/chp/knowledge/publications/iccreport/en/> (accessed 6 March 2012).
 47. International Alliance of Patients' Organizations. Declaration on Patient-Centered Healthcare. 2006. Available from: <http://www.who.int/chp/knowledge/publications/iccreport/en/> (accessed 6 March 2012).

- patientsorganizations.org/attach.pl/547/269/1 APO%20Declaration%20 on%20Patient-Centred%20Healthcare%20-%20Colour.pdf (accessed 6 March 2012).
48. Asche C, LaFleur J & Conner C. Review of diabetes treatment adherence and the association with clinical and economic outcomes. *Clinical Therapeutics* 2011; 331:74-109.
 49. Williams GC & Zeldman A. Patient-centered diabetes self-management education. *Current Diabetes Reports* 2002; 22:145-152.
 50. Norris SL, Chowdhury FM, Van Le K et al. Effectiveness of community health workers in the care of persons with diabetes. *Diabetic Medicine* 2006; 235:544-556.
 51. Organisation for Economic Co-operation and Development. *OECD Health Policy Studies - Improving Value in Health Care: Measuring Quality*. 2010. Available from: <http://www.oecd.org/health/measuringquality> (accessed 6 March 2012).
 52. Novo Nordisk A/S. *Changing Diabetes® Barometer*. 2012. Available from: <http://www.changingdiabetesbarometer.com> (accessed 6 March 2012).
 53. Gudbjörnsdóttir S, Cederholm J, Nilsson PM et al. The National Diabetes Register in Sweden: an implementation of the St. Vincent Declaration for Quality Improvement in Diabetes Care. *Diabetes Care* 2003; 26:1270-1276.
 54. Carstensen B, Christensen JK, Marcussen MM et al. The National Diabetes Register. *Scandinavian Journal of Public Health* 2011; 39 (Suppl.):58-61.
 55. Det Nationale Indikatorprojekt. *Det Nationale Indikatorprojekt: Hvad er det? Hvad får man? Hvad skal der ydes på afdelings-/sygehus- og regionalt niveau?* 2007. Available from: http://www.nip.dk/files/Subsites/NIP/Om%20NIP/20071214_NIP_Pixi.pdf (accessed 6 March 2012).
 56. *European Best Information through Regional Outcomes in Diabetes. Objectives*. 2012. Available from: <http://www.eubirod.eu/objectives.htm> (accessed 6 March 2012).
 57. Federation of European Nurses in Diabetes, International Diabetes Federation Europe. *Diabetes. The Policy Puzzle: Is Europe Making Progress?* 3rd ed. 2011. Available from: <http://www.idf.org/sites/default/files/idf-europe/ThePolicyPuzzleBook.pdf> (accessed 6 March 2012).
 58. Huxley R. Excess risk of fatal coronary heart disease associated with diabetes in men and women: meta-analysis of 37 prospective cohort studies. *BMJ* 2006; 332:73-78.
 59. Ren J & Ceylan-Isik AF. Diabetic cardiomyopathy: do women differ from men? *Endocrine* 2004; 25:73-83.
 60. Shea L & Owens-Gary M. Diabetes and depression in older women - double the risk, double the burden. *Diabetes Voice* 2009; 54:8-11.
 61. Bellamy L, Casas J-P, Hingorani AD et al. Type 2 diabetes mellitus after gestational diabetes: a systematic review and meta-analysis. *Lancet* 2009; 373:1773-1779.
 62. Clausen TD, Mathiesen ER, Hansen T et al. High prevalence of type 2 diabetes and prediabetes in adult offspring of women with gestational diabetes mellitus or type 1 diabetes: the role of intrauterine hyperglycemia. *Diabetes Care* 2008; 312:340-346.
 63. Fetita LS, Sobngwi E, Serradas P et al. Consequences of fetal exposure to maternal diabetes in offspring. *Journal of Clinical Endocrinology & Metabolism* 2006; 91:618-624.
 64. World Diabetes Foundation, Global Alliance for Women's Health. *Diabetes, women, and development. Meeting, expert recommendations for policy action, conclusions, and follow-up actions*. *International Journal of Gynecology & Obstetrics* 2009; 104:S46-S50.
 65. Hanson MA & Gluckman PD. Developmental origins of noncommunicable disease: population and public health implications. *American Journal of Clinical Nutrition* 2011; 94(6 Suppl.):1754S-1758S.
 66. Keeling A & Dain K. IDF: putting women and diabetes on the global agenda. *Diabetes Research and Clinical Practice* 2010; 89:196-199.
 67. Haines L, Wan KC, Lynn R et al. Rising incidence of type 2 diabetes in children in the U.K. *Diabetes Care* 2007; 30:1097-1101
 68. Sinnott M, Carr BM, Walsh C et al. Combination of FINDRISC and fasting plasma glucose (FPG) in screening for type 2 diabetes in an Irish population: the type 2 diabetes mellitus and vascular health initiative (DMVHI). *Diabetologia* 2011; 54(Suppl. 1):S102.
 69. The AMD Annals 2010 Working Group & Cimino A, Fava D, Giorda CB et al. *AMD Annals 2010: Quality Indicators in Diabetes Care in Italy*. 2010. Available from: http://infodiabetes.it/files/Annali_2010_inglese_II.pdf (accessed 6 March 2012).
 70. Goldfracht M, Levin D, Peled O et al. Twelve-year follow-up of a populationbased primary care diabetes program in Israel. *International Journal for Quality in Health Care* 2011; 236:674-681.

71. Gillett M, Dallosso HM, Dixon S et al. Delivering the diabetes education and self management for ongoing and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: cost effectiveness analysis. *BMJ* 2010; 341:c4093
72. World Health Organization. Diabetes Care and Research in Europe: The St Vincent Declaration 1989. Available from: <http://www.idf.org/webdata/docs/SVD%20and%20Istanbul%20Commitment.pdf> (accessed 6 March 2012).
73. European Parliament. Declaration of the European Parliament on diabetes. 2006. Available from: [http://www.europarl.europa.eu/sides/getDoc.do?reference=P6_TA\(2006\)0185&language=EN](http://www.europarl.europa.eu/sides/getDoc.do?reference=P6_TA(2006)0185&language=EN) (accessed 6 March 2012).
74. Council of the European Union. Council Conclusions on promotion of healthy lifestyles and prevention of type 2 diabetes. 2006. Available from: http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/lsa/89847.pdf (accessed 6 March 2012).
75. United Nations. United Nations Resolution 61/225: World Diabetes Day. 2007. Available from [http://www.worlddiabetesfoundation.org/media\(3892,1033\)/UNR_media_kit_0407.pdf](http://www.worlddiabetesfoundation.org/media(3892,1033)/UNR_media_kit_0407.pdf) (accessed 6 March 2012).
76. Council of the European Union. Council conclusions innovative approaches for chronic diseases in public health and healthcare systems. 2010. Available from: "http://whatsnew.eucomed.org/wp-content/uploads/2010/12/101215_"http://whatsnew.eucomed.org/wp-content/uploads/2010/12/101215_council_conclusions_chronic_diseases_071210.pdf (accessed 6 March 2012).
77. European Parliament. EU position and commitment in advance of the UN high-level meeting on the prevention and control of non-communicable diseases. 2011. Available from: <http://www.europarl.europa.eu/sides/>"<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P7-TA-2011-0390+0+DOC+XML+V0//EN&language=EN> (accessed 6 March 2012).
78. The Emerging Risk Factors Collaboration. Diabetes Mellitus, Fasting Glucose, and Risk of Cause-Specific Death. *N Engl J Med* 2011; 364:829-841.
79. Stratton IM, Adler AI, Neil AW et al. Association of glycemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. *BMJ* 2000; 321:405-412.
80. Gæde P, Lund-Andersen H, Parving HH et al. Effect of a multifactorial intervention on mortality in type 2 diabetes. *New England Journal of Medicine* 2008; 358:580-591.
81. UK Prospective Diabetes Study Group. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. *BMJ* 1998; 317:703-713.
82. Action to Control Cardiovascular Risk in Diabetes Study Group, Gerstein HC, Miller ME, Byington RP et al. Effects of intensive glucose lowering in type 2 diabetes. *New England Journal of Medicine* 2008; 358:2545-2559.
83. ADVANCE Collaborative Group, Patel A, MacMahon S, Chalmers J et al. Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes. *New England Journal of Medicine* 2008; 358:2560-2572.
84. Duckworth W, Abraira C, Moritz T et al. VADT Investigators. Glucose control and vascular complications in veterans with type 2 diabetes. *New England Journal of Medicine* 2009; 360:129-139.
85. Ray KK, Seshasai SR, Wijesuriya S et al. Effect of intensive control of glucose on cardiovascular outcomes and death in patients with diabetes mellitus: a meta-analysis of randomised controlled trials. *Lancet* 2009; 373:1765-1772.
86. Turnbull FM, Abraira C, Anderson RJ, et al. Intensive glucose control and macrovascular outcomes in type 2 diabetes. *Diabetologia* 2009; 52:2288-98.
87. Holman N, Forouhi NG, Goyder E et al. The Association of Public Health Observatories (APHO) Diabetes Prevalence Model: estimates of total diabetes prevalence for England, 2010-2030. *Diabetic Medicine* 2011; 28:575-582.
88. Pyorala K, Pedersen TR, Kjekshus J et al. Cholesterol lowering with simvastatin improves prognosis of diabetic patients with coronary heart disease. A subgroup analysis of the Scandinavian Simvastatin Survival Study (4S). *Diabetes Care* 1997; 20:614-620.
89. Heart Outcomes Prevention Evaluation Study Investigators. Effects of ramipril on cardiovascular and microvascular outcomes in people with diabetes mellitus: results of the HOPE study and MICRO-HOPE substudy. *Lancet* 2000;355:253-259.
90. Egede LE, Zheng D & Simpson K. Comorbid depression is associated with increased health care use and expenditures in individuals with

- diabetes. *Diabetes Care* 2002; 25:464-470.
91. de Groot M, Anderson R, Freedland KE et al. Association of depression and diabetes complications: a meta-analysis. *Psychosomatic Medicine* 2001; 63:619-630.
 92. Lin EH, Katon W, Von Korff M et al. Relationship of depression and diabetes self-care, medication adherence, and preventive care. *Diabetes Care* 2004; 27:2154-2160.
 93. Gannon B & Nolan B. Disability and labor force participation in Ireland. *The Economic and Social Review* 2004; 35:135-155.
 94. Koopmanschap M. Coping with type II diabetes: the patient's perspective. *Diabetologia* 2002; 45:S18-S22.
 95. Kanavos P, van den Aardweg S & Schurer W. Diabetes expenditure, burden of disease and management in 5 EU countries. 2012. Available from: "<http://www2.lse.ac.uk/LSEHealthAndSocialCare/research/LSEHealth/MTRG/http://www2.lse.ac.uk/LSEHealthAndSocialCare/research/LSEHealth/MTRG/LSEDiabetesReport26Jan2012.pdf> (accessed 6 March 2012).
 96. F Storms, F Carinci, C De Beaufort, M Massi Benedetti on behalf of the EUBIROD Consortium, Towards a European Diabetes Information System: from St. Vincent Declaration to EUDIP, EUCID, BIRO and EUBIROD. Are we getting closer? EUPHA Conference 2010, Amsterdam, Netherlands, 12th November 2010, disponibile presso: HYPERLINK "http://www.eubirod.eu/documents/poster/storms_eupha2010.pdf" http://www.eubirod.eu/documents/poster/storms_eupha2010.pdf
 97. F Carinci on behalf of the EUBIROD Consortium, A Novel International Framework for Privacy-Enhanced Data Processing, Exchange, and Pooled Analysis of Disease Registers: The European BIRO/EUBIROD Projects Academy Health Research Meeting 2010, Boston, Massachusetts, USA, June 2010, disponibile presso: <http://www.academyhealth.org/files/2010/tuesday/carincif.pdf> <http://www.academyhealth.org/files/2010/tuesday/carincif.pdf>
 98. F Carinci, V Baglioni, CT Di Iorio, L Rossi, J Azzopardi, P Beck, S Cunningham, S Skeie, G Olympios, S Pruna, M Massi Benedetti. A novel framework for the routine production of EU indicators: the BIRO system, European Working Conference on Health Services Research, The Hague, Netherlands, April 2010, disponibile presso: "https://www.surfgroepen.nl/sites/hsr-europe/SiteCollectionDocuments/Posters/87_Fabrizio.Carinci.pdf" https://www.surfgroepen.nl/sites/hsr-europe/SiteCollectionDocuments/Posters/87_Fabrizio.Carinci.pdf
 99. F. Carinci, M. Massi Benedetti, EUBIROD Consortium. Monitoring diabetes outcomes across Europe, and beyond: the EU DG SANCO funded EUBIROD project, Abstract Book of the IDF World Diabetes Congress, Montreal, Canada, 18-22 October 2009, D-0721, pag. 242, disponibile presso: "http://www.eubirod.eu/documents/papers/IDF2009_EUBIROD_abstract.pdf" http://www.eubirod.eu/documents/papers/IDF2009_EUBIROD_abstract.pdf
 100. F Carinci, L Rossi. A European model for the automatic production of standardized performance indicators: the BIRO statistical engine, EUPHA Conference 2010, Amsterdam, Netherlands, 12th November 2010, disponibile presso: "http://www.eubirod.eu/documents/slides/f.carinci_eupha2010_final.pdf" http://www.eubirod.eu/documents/slides/f.carinci_eupha2010_final.pdf
 101. F. Carinci, M. Massi Benedetti, Conoscere il diabete in Europa attraverso le 'lenti' dei registri regionali: il progetto Eubirod parla italiano, disponibile presso: <http://www.changingdiabetesbarometeritaly.com/pdf/aprile-2010/sole-24-ore-2010.pdf> <http://www.changingdiabetesbarometeritaly.com/pdf/aprile-2010/sole-24-ore-2010.pdf>
 102. CToncetta Tania Di Iorio, Fabrizio Carinci, Massimo Brillante, Joseph Azzopardi, P Beck, N Bratina, SG Cunningham, C De Beaufort, N Debacker, P Jarosz-Chobot, M Jecht, U Lindblad, T Moulton, } Metelko, A Nagy, G Olympios, S Pruna, M R-der, S Skeie, F Storms and M Massi Benedetti. Cross-border flow of health information: is privacy by design enough? Privacy performance assessment in EUBIROD, *Eur J Public Health* (2012), May 4, 2012
 103. CT Di Iorio, F Carinci, V Baglioni, J Azzopardi, P Beck, S Cunningham, A Evripidou, G. Leese, K. F. Loevaas, G Olympios, M Orsini Federici, P Palladino, S Pruna, S Skeie, P Taverner, V Traynor, M Massi Benedetti. Privacy Impact Assessment in the design of transnational public health information system: the BIRO project *Journal of Medical Ethics*, 2009, (35)12, 753-761
 104. CT Di Iorio, F Carinci on behalf of the EUBIROD Consortium. Cross-border flow of health information: is privacy by design sufficient to obtain complete and accurate data for public health in Europe? The case of BIRO/EUBIROD diabetes registers EU-

- PHA Conference 2010, Amsterdam, Netherlands, 12th November 2010, disponibile presso: "http://www.eubirod.eu/documents/slides/ct.diiorio_eupha2010_final.pdf" http://www.eubirod.eu/documents/slides/ct.diiorio_eupha2010_final.pdf.
105. CT Di Iorio, R Ad-ny, J Azzopardi, T Battelino, P Beck, G Boran, M Brillante, SG Cunningham, C de Beaufort, N Debacker, PK Jarosz-Chobot, M Jecht, U Lindblad, } Metelko, G Olympios, S Pruna, M R-der, S Skeie, F Storms, D Whiting, M Massi Benedetti and F Carinci, Privacy Impact Assessment Report, EUBIROD Consortium, 2010, disponibile presso: "http://www.eubirod.eu/documents/downloads/D5.2_final_update_2012.pdf" http://www.eubirod.eu/documents/downloads/D5.2_final_update_2012.pdf
106. F Carinci, CT Di Iorio, W Ricciardi, N Klazinga and M Verschuuren, Revision of the European Data Protection Directive: opportunity or threat for public health monitoring? *Eur J Public Health*. 2011 Dec;21(6):684-5. Epub 2011 Jul 23
107. B.Zander, R.Busse. Coordination with European and International Health Data Initiatives EUROReach Workpackage 2, March 2012, disponibile presso: "<http://www.euroreach.net/activities/workpackages/w2>" <http://www.euroreach.net/activities/workpackages/w2>

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