

Bundesgesundheitsbl 2018 · 61:1300–1306  
<https://doi.org/10.1007/s00103-018-2806-z>  
 Published online: 6 September 2018  
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# National public health system responses to diabetes and other important noncommunicable diseases

## Background, goals, and results of an international workshop at the Robert Koch Institute

### Introduction

#### Background

Diabetes mellitus and other noncommunicable diseases (NCDs) present a growing burden for countries across the world, regardless of their economic situation. Therefore, the World Health Organization (WHO) has developed a global action plan for the prevention and control of NCDs [1, 2]. Two key objectives of the action plan are (1) to reduce modifiable risk factors through a health-promoting environment and (2) to monitor trends and determinants of NCDs. Both goals are

closely linked through the public health action cycle. Monitoring and surveillance serve as an essential basis for the development of prevention measures and their evaluation. Since the launch of the WHO global action plan in 2013, many countries have started implementing national strategies for prevention of NCDs, including disease surveillance systems.

#### Workshop goals

For the exchange of best practice examples regarding NCD surveillance and prevention strategies, the Robert Koch Institute (RKI) and the Federal Center for Health Education (BZgA) jointly organized a two-day international workshop in Berlin on June 7–8, 2018. The first day focused on the implementation of NCD

surveillance activities, formats for timely and targeted dissemination of results, and the link to prevention strategies. The talks covered the following topics:

- Development of a national diabetes surveillance system in Germany—current status
- Continuous efforts for strengthening of data sources to overcome limitations, especially of routine data in Belgium
- Development of innovative digital formats for information dissemination based on examples from Switzerland and England
- A systematic approach for the stepwise expansion from diabetes to NCD surveillance as implemented in Canada

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- Integration of surveillance data into the evaluation of prevention programs as shown by the North Karelia Project in Finland

On the second day, the different approaches for the development of diabetes prevention strategies with regard to the country-specific political environment and health care systems were discussed, which was reflected in the presentations:

- Development of the national awareness and prevention strategy on diabetes in Germany—aims, approach, activities
- Participatory approach for the successful implementation of a diabetes prevention strategy reflecting the country-specific stakeholder landscape in Austria and Switzerland
- Continuous adjustment and advancement of diabetes prevention measures based on surveillance data in a real-world setting in Finland
- Development of a primary prevention program for type 2 diabetes and its gradual implementation in the environment of the English health care system

## Results

### Presentations on day 1

#### From diabetes surveillance to NCD surveillance—Christa Scheidt-Nave

Diabetes is one of the major NCDs, with about 6.7 million adults affected in Germany [3, 4]. Despite improvements in screening and treatment, persons affected by diabetes still have an increased mortality and risk for complications. Therefore, diabetes is associated with a high societal burden and costs for the German health care system. In response to this public health challenge, the Federal Ministry of Health commissioned the RKI with the development of a diabetes surveillance system.

During the first project phase, a conceptual framework was developed [5] and consensus on 40 indicators for the surveillance of diabetes was reached among experts and stakeholders at the national and regional level by applying a

two-tier Delphi method [6]. The indicators were assigned to four areas of action: (1) reducing diabetes risk, (2) improving diabetes early detection and treatment, (3) reducing diabetes complications, and (4) reducing the disease burden and costs. Both primary data from the national health surveys and secondary data from claims data or official statistics enable the description of indicators and regular data updates. In order to ensure the timely and targeted dissemination of results, the project currently focuses on improved use and collation of existing data sources as well as the development of interactive publication formats.

As many NCDs follow comparable causal chains with common risk factors, the diabetes surveillance serves as a model for surveillance of other NCDs. The developed conceptual framework, the established network of stakeholders, and the growing database can act as leverage for the implementation of a sustainable NCD surveillance system.

#### NCD surveillance in Belgium—Petronille Bogaert, Herman van Oyen

In Belgium, NCDs contribute to 85% of the total burden of disease, including 2% due to diabetes. Of persons aged at least 15 years, 28% reported having more than one chronic disease or long-lasting disability [7]. NCDs have been identified as a priority in the national Priority to Chronic Diseases program.

In 2015, the Belgian Federal Minister of Health launched a plan for integrated care of chronic diseases: the patient and his or her environment are at the center of a care continuum which works across silos of providers. The plan aims to: (1) improve health and equity for all populations, specifically the chronically ill; (2) improve the quality, safety, and experiences of care; and (3) create best value for public health system resources. Further NCD targets are formulated at the federal level, as the competences on, e.g., health promotion, are distributed.

Information on NCDs and their determinants are collected through primary data sources (Health Interview Survey) and routine data (insurance, general practitioners, and hospital records). The

latter often focus on care as a clinical performance measurement rather than assessing the health of the population.

Overall, disease-specific information on incidence or prevalence is difficult to obtain. Efforts should be maintained to strengthen the data sources for the surveillance of NCDs, and to prepare this information for policy decision-making.

#### NCD monitoring and knowledge transfer in Switzerland—Laure Curt, Wally Achtermann

In Switzerland, cancer, diabetes, cardiovascular diseases, and chronic respiratory diseases are responsible for over 50% of premature mortality (deaths before the age of 70 years) among men and over 60% among women. Together with musculoskeletal disorders, these five NCDs account for around 40% of total health care costs.

In order to address the NCD challenge, the Federal Office of Public Health (FOPH) initiated and developed the National Strategy on the Prevention of NCDs (NCD strategy 2017–2024) in close cooperation with the 26 Swiss cantons and numerous stakeholders [8]. Since then, the NCD strategy and the National Drug Strategy have replaced the national programs on alcohol, tobacco, drugs, diet, and physical activity which had shaped the federal prevention policy over the last 20 years.

This new strategy allows the federal government to focus on the prevention of NCD risk factors, while disease-specific strategies such as the national strategy for cardiovascular diseases, stroke, and diabetes (CVSD) are drafted and implemented by the cantons and nongovernmental public health associations.

Monitoring and research are considered core activities within one of five action fields of the NCD strategy. Overall, 99 NCD indicators [9] have been selected, among them seven that relate to diabetes. These indicators not only survey the development of NCDs and their risk factors in Switzerland, they also assess the long-term impact of the NCD strategy and its action plan on population health. The NCD indicators will be online from autumn 2018.

Bundesgesundheitsbl 2018 · 61:1300–1306 <https://doi.org/10.1007/s00103-018-2806-z>  
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## National public health system responses to diabetes and other important noncommunicable diseases. Background, goals, and results of an international workshop at the Robert Koch Institute

### Abstract

Diabetes mellitus and other noncommunicable diseases (NCDs) represent an emerging global public health challenge. In Germany, about 6.7 million adults are affected by diabetes according to national health surveys, including 1.3 million with undiagnosed diabetes. Complications of diabetes result in an increasing burden for individuals and society as well as enormous costs for the health care system. In response, the Federal Ministry of Health commissioned the Robert Koch Institute (RKI) to implement a diabetes surveillance system and the Federal Center for Health Education (BZgA) to develop a diabetes prevention strategy. In a two-day workshop jointly organized by the RKI and the BZgA,

representatives from public health institutes in seven countries shared their expertise and knowledge on diabetes prevention and surveillance. Day one focused on NCD surveillance systems and emphasized both the strengthening of sustainable data sources and the timely and targeted dissemination of results using innovative formats. The second day focused on diabetes prevention strategies and highlighted the importance of involving all relevant stakeholders in the development process to facilitate its acceptance and implementation. Furthermore, the effective translation of prevention measures into real-world settings requires data from surveillance systems to identify high-risk groups and

evaluate the effect of measures at the population level based on analyses of time trends in risk factors and disease outcomes. Overall, the workshop highlighted the close link between diabetes prevention strategies and surveillance systems. It was generally stated that only robust data enables effective prevention measures to encounter the increasing burden from diabetes and other NCDs.

### Keywords

Diabetes mellitus · Noncommunicable diseases · Public Health · Surveillance · Prevention

## Nationale Public-Health-Maßnahmen für Diabetes und andere wichtige nichtübertragbare Krankheiten. Hintergrund, Ziele und Ergebnisse eines internationalen Workshops am Robert Koch-Institut

### Zusammenfassung

Diabetes mellitus und andere nichtübertragbare Krankheiten („noncommunicable diseases“, NCD) stellen global eine wachsende Herausforderung dar. Gemäß nationalem Gesundheitssurvey sind in Deutschland 6,7 Mio. Erwachsene an Diabetes erkrankt, davon sind 1,3 Mio. Fälle nicht diagnostiziert. Diabeteskomplikationen führen zu einer hohen Krankheitslast für Betroffene und Gesellschaft sowie zu enormen Kosten für das Gesundheitssystem. Als Reaktion beauftragte das Bundesministerium für Gesundheit das Robert Koch-Institut (RKI) mit der Entwicklung einer Diabetes-Surveillance und die Bundeszentrale für gesundheitliche Aufklärung (BZgA) mit der Erarbeitung einer Aufklärungs- und Kommunikationsstrategie

zu Diabetes. Zum Erfahrungsaustausch bezüglich dieser beiden Themen organisierten RKI und BZgA gemeinsam einen 2-tägigen Workshop mit Fachkundigen aus dem Public-Health-Bereich aus 7 Ländern. Der erste Tag behandelte NCD-Surveillance-Systeme und betonte die Stärkung von Datenquellen sowie die zeitnahe und zielgerichtete Veröffentlichung der Ergebnisse mittels innovativer Formate. Am zweiten Tag wurden Präventionsstrategien diskutiert und die Einbindung aller relevanten Stakeholder in deren Entwicklung unterstrichen, da dies die Akzeptanz und Implementierung vereinfacht. Weiterhin werden zur effektiven Umsetzung von Präventionsmaßnahmen Surveillance-Daten benötigt, um Hochrisikogruppen zu

identifizieren und den Effekt der Maßnahmen auf Bevölkerungsebene anhand zeitlicher Trends von Risikofaktoren und Krankheitsindikatoren zu evaluieren. Zusammengefasst zeigt der Workshop die starke Verbindung zwischen Präventionsstrategien und Surveillance. Es wurde betont, dass erst solide Daten effektive Präventionsmaßnahmen ermöglichen, um der wachsenden Krankheitslast von Diabetes und anderen NCD entgegenzuwirken.

### Schlüsselwörter

Diabetes mellitus · Nichtübertragbare Krankheiten · Public Health · Surveillance · Prävention

## Public Health England's approach to NCD surveillance—Justine Fitzpatrick

The role of Public Health England (PHE) is to protect and improve the health of England's population, and to reduce inequalities in health. Surveillance is a core function of PHE and a guideline setting the principles of PHE's surveillance has been published [10].

A major element of PHE's NCD surveillance work is the collation, analysis, and presentation of data that have been collected by PHE and other agencies. This analysis is then used to monitor trends in health outcomes, the wider determinants of health, and those elements of health service use which inform public health action. The main presentation vehicle for PHE's surveillance activi-

ties is the Fingertips platform (<http://fingertips.phe.org.uk>). This platform is also used for publication of indicators used for monitoring the government's strategy for health improvement, the Public Health Outcomes Framework (PHOF).

This PHOF consists of two high-level indicators for monitoring improvement in life expectancy and inequalities in

healthy life expectancy as well as other indicators organized across the domains of public health. The Fingertips platform is also used for diabetes surveillance and includes indicators for prevalence and risk, care process, structured education, treatment targets, and complications.

PHE's ambition for NCD surveillance is to expand the data sources used to include more innovative and digital sources, increase automation of outputs, expand modelling capabilities, and develop clearer mechanisms for the initiation of action based on surveillance findings.

### **Surveillance of chronic diseases in Canada: a collaborative approach—Louise Pelletier**

The Canadian Chronic Disease Surveillance System (CCDSS) is a collaborative network of provincial and territorial surveillance systems supported by the Public Health Agency of Canada (PHAC). It started as the National Diabetes Surveillance System in 1999.

The CCDSS collects data on all Canadians who are eligible for provincial or territorial health insurance and covers approximately 97% of the population. The CCDSS can generate national estimates and trends over time for 19 chronic diseases, multimorbidities, and direct health care costs for selected diseases. The CCDSS identifies disease cases from provincial and territorial administrative health databases, including physician billing claims, hospital discharge abstract records, and publicly funded drug databases, which are linked to provincial and territorial health insurance registry records using a unique personal identifier (ID). Only aggregated data are submitted to PHAC, respecting the provincial and territorial obligations to protect individual privacy.

Numerous chronic disease surveillance products are generated from the CCDSS and other data sources (such as national surveys, vital statistics). These include the Public Health Infobase, disease-specific reports, fact sheets, and infographics. The Public Health Infobase is of particular interest, since it includes the CCDSS data tool and the Canadian Chronic Disease Indicators, which are

updated annually [11]. In addition, the CCDSS datasets are available through the Government of Canada—Open Data.

### **From a demonstration project to national action—development of NCD prevention in Finland—Pekka Jousilahti**

Mortality from coronary heart disease (CHD) and other NCDs started to increase in Finland in the 1950s. In the late 1960s, CHD mortality was the highest in the world, particularly high among working-age men in the eastern part of the country.

The North Karelia Project, a community-based project aimed at preventing cardiovascular disease (CVD), was launched in 1972 [12]. The main aim was to reduce the high mortality from CHD by reduction of the three main CVD risk factors: smoking, high serum cholesterol, and elevated blood pressure. The project focused on behavioral change through community action, supported by screening of high-risk individuals and medical treatment. Systematic monitoring of risk factors in the population was developed as part of the project.

Between 1972 and 2012, the levels of CVD risk factors decreased markedly [13]. Smoking prevalence fell from 53 to 29% among men. Smoking was rare among women in the 1970s, and an increase was observed (from 11 to 19%). In both sexes, serum total cholesterol declined remarkably during the first 35 years but increased slightly between 2007 and 2012. Mean blood pressure decreased considerably in both men and women.

From the baseline level in 1969–1972 to 2012, CHD mortality decreased by 82% in working-age (35–64 years) men and by 84% in working-age women. During the first 10 years, changes in risk factors contributed to nearly all of the reduction in CHD mortality. In the 1990s, about three quarters, and in the last 10 years, about two thirds of the CHD mortality reduction could be explained by changes in the three main CVD risk factors.

Reductions in disease burden and mortality due to CHD can be achieved through the use of population-based primary prevention programs. Secondary prevention among high-risk individu-

als and treatment of acute CHD events could confer additional benefit.

## **Presentations on day 2**

### **The national awareness and prevention strategy on diabetes in Germany—Daniela Zahn**

The national awareness and prevention strategy on diabetes in Germany was initiated by the Federal Ministry of Health to tackle the challenges associated with the increasing number of people with diabetes in order to contribute to the goals of the Saint Vincent Declaration [14]: reduce diabetes incidence, improve early detection and early treatment, and reduce late complications and improve quality of life. The German health care system offers a range of diabetes-related prevention and care measures. However, such services are underused. There are also knowledge deficits concerning diabetes as well as a need for more information among health care professionals [15]. Besides this, people with diabetes often report stigmatization. Thus, the national awareness and prevention strategy on diabetes in Germany aims at increasing knowledge and awareness about diabetes and diabetes-specific health literacy, improving health care use in vulnerable groups and decreasing stigmatization.

In order to reach these goals, the strategy's approach includes a thorough needs assessment, on the basis of which preventive measures are developed and implemented. To ensure broad acceptance by relevant stakeholders and to facilitate long-term implementation of the strategy, a participatory approach by means of an advisory board including important stakeholders (e.g., scientific societies, patient organizations, health care professionals, and health insurance companies) is chosen. The next steps are to develop the strategy's concept, launch its planned web-based information system, and conduct and evaluate preventive actions according to the strategy's concept.

### The development of the Austrian diabetes strategy—a participatory approach—Raimund Weitgasser

Diabetes represents a major challenge for health care providers worldwide. In 2016, the Austrian Ministry of Health and Women's Affairs initiated the development of the Austrian Diabetes Strategy. Main goals of the strategic framework were to reduce the probability of the Austrian population to develop diabetes and to enable people with diabetes living in Austria to maintain the highest possible quality of life for as long as possible.

The Austrian Diabetes Strategy was developed by means of a broad participatory process, taking into account all interest groups' and stakeholders' input to support the successful and sustainable implementation of the strategy. More than 100 decision-makers—experts and representatives of the national government, federal states, social insurance institutions, self-help groups, and professional representatives—were invited to participate. Five relatively small effective working groups were formed to define the strategy's objectives and recommendations. An even broader range of stakeholders were invited to comment on the draft version of the strategy. The final version was peer reviewed by two international experts.

The strategy contains six broad objectives such as improving diabetes-specific knowledge in the general population (goal 01) or empowering diabetes patients with respect to self-management (goal 03), as well as specific recommendations on how to reach these objectives. Based on the strategy, an action plan including measurable outcomes will be developed with all relevant partners [16].

### The Swiss National Strategy for Cardiovascular Diseases, Stroke, and Diabetes (2017–2024)—Peter Diem

In 2016, the joint platform for dialogue on national health policy set up by the federal and cantonal governments developed the Swiss National Strategy for the Prevention of NCDs, envisioning that “more people (should) stay healthy or enjoy a high quality of life despite chronic

illness” and “fewer people (should) contract avoidable NCDs or die prematurely” [8]. In parallel, a large number of professional societies and organizations from the health care system, patient organizations, leagues, and other relevant players have developed a disease-specific strategy for cardiovascular diseases and diabetes [17]. This strategy was developed using an inter-professional and interdisciplinary participative process under the leadership of the network CardioVasc Suisse.

Supplementing the Swiss National Strategy for the Prevention of NCDs, the strategy for CVDs and diabetes aims to strengthen prevention and early detection, promote high-quality, integrated, and patient-centered care for chronically ill and multimorbid patients, optimize acute care of heart attack and stroke, reinforce coordination and cooperation at all levels, improve the available data(bases) for Switzerland, and close funding gaps and improve the health policy framework [17]. Priorities with regard to diabetes were: identifying persons at risk, promoting best practice guidelines as well as interdisciplinary care, to empower people with diabetes, and to improve knowledge regarding complications and access to optimal treatment and care [17]. Furthermore, the strategy aims to improve the quality of epidemiological data and promote a Swiss Diabetes Registry. The strategy defines objective specific measures and assigns authorities to be responsible for the implementation of such measures. This will be done in consultation with the Steering Committee of the strategy and the Coordination Office.

### Prevention of type 2 diabetes in Finland—challenges, lessons learnt, and recent advancements—Jaana Lindström

Type 2 diabetes is a great challenge for the health care system also in Finland, due to, e.g., population ageing, increasing obesity, and changes in lifestyle. In order to tackle the epidemic, health promotion activities targeted at the whole population are mandatory. In addition, actions directed toward individuals and population groups at increased risk are needed.

The Finnish Diabetes Prevention Study (DPS) was the first controlled, individually randomized clinical trial to show that type 2 diabetes is preventable by lifestyle intervention. Follow-up of the study participants further demonstrated that the effect of intervention can be sustained for several years.

The results of the clinical trial were soon put into practice as Finland started the national diabetes program (DEHKO 2000–2010) and its implementation pilot project FIN-D2D (2003–2008) led by the Finnish Diabetes Association. The pilot project included a strong and novel component of risk identification and prevention of diabetes. Positive learnings from FIN-D2D include the recognition of importance of risk screening and preventive services provided by the health care system. Still, challenges such as behavioral maintenance, changing health care systems, and changing societies and living environments need to be addressed with new strategies.

StopDia is an on-going national initiative aiming at stopping diabetes by three levels of action: individual, environmental, and societal, with strong theoretical background and use of digital solutions. To make the uptake of new models like StopDia feasible for society, consideration of new innovative funding mechanisms, such as the Social Impact Bond (SIB), are timely.

### Experiences developing and implementing in England the National Health Service (NHS) Diabetes Prevention Program—Jonathan Valabhji

The increase in prevalence of overweight, obesity, and type 2 diabetes has implications for the sustainability of health systems internationally. In 2014, the NHS in England committed to becoming the first country to implement a national evidence-based type 2 diabetes prevention program (DPP).

The Healthier You: NHS DPP was launched in 2015, and the ambition of universal national coverage will be realized in Summer 2018 [18]. Interventions involve an initial assessment and at least 13 face-to-face group-based sessions, involving at least 16 h of contact time over

at least 9 months. First-year data have been published [19]. By the end of March 2018, the program had achieved 75% coverage of England; 182,000 individuals had been referred into the program, with 59% conversion to attendance at initial assessment. Completion rates for those who attend the first intervention session are 52%, and mean weight loss in completers is 3.3 kg.

A digital component to the program, offering remote delivery, will recruit 5000 individuals with a formal evaluation to assess effectiveness in real-world environments and will report in late 2019. An independent evaluation assessing effects of the full program on type 2 diabetes incidence in England will report in 2021.

## Conclusion

Following the WHO call for action, many countries responded to the growing burden from NCDs. Both a reliable disease surveillance system and an aligned prevention strategy are essential parts of their responses. However, approaches differ mainly between countries, influenced by the country-specific health care system and political environment.

Both Germany and Belgium are in the early stages of developing an NCD surveillance system. For its implementation, reliable data sources—both primary and secondary—are key, and continuous effort is needed to strengthen and validate the available data. A strong and sustainable surveillance system is crucial to both the identification of high-risk groups and for the evaluation of preventive measures. This has already been demonstrated in the Finnish North Karelia Project and is also becoming evident in the ongoing evaluation of the National Health Service Diabetes Prevention Program in England. For timely dissemination of surveillance data, innovative digital formats can be used, such as the Fingertips Platform in the UK or comparable platforms in Canada and Switzerland.

The discussion on the development of preventive strategies highlighted the importance of a participatory approach to facilitate the acceptance and implementation of a strategy, as shown in Austria and Switzerland. As demonstrated

by the long-standing experiences in Finland, preventive measures can be effectively and successfully implemented in a real world setting. However, the implementation of a sustainable strategy needs sound funding. New models such as the Social Impact Bond in Finland may introduce new funding opportunities. In general, targeting vulnerable groups as well as tailoring interventions to population characteristics and needs has been emphasized. This may be achieved by using new digital technologies, lowering barriers to health care use, or addressing environmental determinants. Continuous (re-)adjustment of preventive measures based on local context and surveillance data is crucial.

Above all, the workshop demonstrated the close link between diabetes prevention strategies and surveillance as well as the coordination of both in order to meet the challenge of diabetes and other NCDs.

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**Acknowledgements.** We would like to express our special thanks to Mr. Sezai Arslan, who organized the event very thoroughly, setting the basis for a very productive two-day workshop.

## Compliance with ethical guidelines

**Conflict of interest.** L. Reitzle, S. Hansen, R. Paprott, W. Achtermann, J. Baumert, P. Bogaert, L. Curt, Y. Du, S. Eiser, J. Fitzpatrick, C. Heidemann, P. Jousilahti, B. Kulzer, J. Lindström, H. Neuhauser, H. van Oyen, L. Pelletier, C. Schmidt, J. Valabhji, R. Weitgasser, T. Ziese, D. Zahn, and C. Scheidt-Nave declare that they have no competing interests. P. Diem was an editor of the diabetes section of the National strategy for cardiovascular diseases, stroke and diabetes.

This article does not contain any studies with human participants or animals performed by any of the authors.

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