COST Action CA18218
European Burden of Disease Network

1st WG meeting & 2nd MC meeting

Burden of Disease in Europe
Taking stock and moving forward

National Food Institute, Technical University of Denmark
Kgs. Lyngby, Copenhagen, Denmark
18-19 February 2020

www.burden-eu.net/DTU2020

DTU Food
National Food Institute

DTU Technical University of Denmark

1st WG meeting & 2nd MC meeting

Local organizing committee

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Program

Tuesday 18 February 2020

Working Group Meeting

9h00	Registration	
9h30	Welcome & Presentation of COST action CA18218 burden-eu	Room 146
10h00	Short-term scientific missions & IPC conference grants	Room 146
10h15	COST administration: reimbursement rules	Room 146
10h30	Coffee break	
11h00	**Using temporal heat maps as a visualization tool to analyze time changes: A preliminary analysis of death and disability-adjusted life year rates in the European Union** *— João Vasco Santos, ARS Norte / University of Porto, PT*	Room 146
11h10	**Disease burden in the Nordic region: Toll of life style differs among neighbour welfare states. Results from the Global Burden of Disease Study 2017** *— Ann Kristin Knudsen, Norwegian Institute of Public Health, NO*	Room 146
11h20	**National burden of diseases studies using Disability-Adjusted Life Years (DALYs) measure. Evolution of methods and construction of DALY – the example of Poland, 1997 – 2019** *— Katarzyna Kissimova-Skarbek, Jagiellonian University, PL*	Room 146
11h30	**The burden of disease in Spain: Results from GBD 2016** *— Joan B Soriano, Hospital de La Princesa, ES*	Room 146
11h40	**Estimating mortality attributed to ill-defined codes of death and at national and local level in Serbia** *— Jovana Todorovic, University of Belgrade, RS*	Room 146
11h50	**Development and growth of the Italian Global Burden of Disease Initiative** *— Lorenzo Monasta, Institute for Maternal and Child Health, IT*	Room 146
12h00	**Does the choice of life table in Burden of Disease studies impact how causes are ranked?** *— Georgia MC Dyer, Lund University, SE*	Room 146
12h10	**Disease burden calculation in the health impact assessment of the anti-smoking legislation proposal in Hungary** *— Balázs Ádám, University of Debrecen, HU*	Room 146
12h20	**Substituting red meat with pulses in the Danish diet: The impact on disease burden** *— Freja Fabricius, Technical University of Denmark, DK*	Room 146
12h30	**Report of pilot workshop 'Estimating the national burden of foodborne disease'** *— Lucie Vermeulen, National Institute for Public Health and the Environment, NL*	Room 146
12h40	**Computing the burden of infectious diseases in an ageing population: Accounting for competing mortality risks** *— Scott McDonald, National Institute for Public Health and the Environment, NL*	Room 146
12h50	**Application of a new methodology and R package reveals a high burden of healthcare-associated infections (HAI) in Germany compared to the average in the European Union/European Economic Area, 2011 to 2012** *— Sebastian Haller, Robert Koch Institute, DE*	Room 146

13h00	Lunch	
Separate WG Sessions – Vertical pillars (WG1-3)		
14h00	WG1 – Non-communicable diseases and injuries	Room 146
14h00	WG2 – Infectious diseases	Room 148
14h00	WG3 – Risk factors	Room 143
15h30	Coffee break	
Separate WG Sessions – Horizontal pillars (WG4-5)		
16h00	WG4 – Methods	Room 146
16h00	WG5 – Knowledge translation	Room 143
17h30	Closure of day 1	

burden-eu dinner

19h00	Madklubben Bistro-de-Luxe

Wednesday 19 February 2020

Working Group Meeting

9h00	Welcome by Prof. Rasmus Larsen, Executive Vice President and Provost, Technical University of Denmark	Room 146
9h20	**Update on the GBD 2019 study (videocall)** *— Mohsen Naghavi, Institute for Health Metrics and Evaluation*	Room 146
9h40	**Measuring the impact of communicable diseases: methodologies, challenges and lessons learned** *— Alessandro Cassini, World Health Organization*	Room 146
10h10	**Estimation of burden of disease and recent developments in Australia** *— Richard Juckes, Australian Institute of Health and Welfare*	Room 146
10h40	Coffee break	
11h10	**The role of burden of disease analysis in evidence-informed policy making** *— Tarang Sharma, WHO Regional Office for Europe*	Room 146
11h40	Presentations of discussions and decisions of the WG meetings	Room 146
12h55	Closure of Working Group meeting	Room 146
13h00	Lunch	

Management Committee Meeting

(restricted to invited MC members, substitutes and observers)

14h00	MC meeting	Room 146
16h00	Closure of MC meeting	

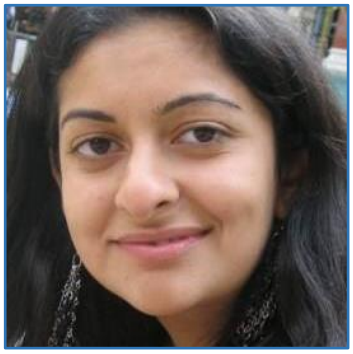
Invited speakers

Alessandro Cassini, World Health Organization

Alessandro Cassini is a medical doctor specialized in public health and epidemiology of infectious diseases. After an MSc LSE & LSHTM, he joined the European centre for Disease Prevention and Control to lead the Burden of Communicable Diseases in Europe (BCoDE) project, while also focusing on bridging the communication and technical gap between risk assessors and managers (knowledge translation) and ultimately enhancing informed and evidence-based health policy decision-making. At ECDC, Alessandro has also been responsible for country visits to discuss AMR issues, for field work in outbreak response (e.g. Ebola), for EUCAST and supported the development of risk ranking methodologies. In March 2019, Alessandro joined the Infection Prevention and Control (IPC) Technical and Clinical Hub (Department of Integrated Health Services) at the World Health Organization.

Richard Juckes, Australian Institute for Health and Welfare

Richard Juckes is the head of Health Group at the Australian Institute of Health and Welfare. The AIHW produces authoritative, independent information and statistics to inform and support better policy and service delivery decisions, leading to better health and wellbeing for all Australians. Health Group focuses on the health status of the population, monitoring diseases and risk factors and undertaking Australian Burden of Disease analysis and reporting. Richard has developed expertise across many components of the Australian health system, working in a wide range of health policy and health data roles for over 20 years.



Tarang Sharma, World Health Organization European Regional Office

Tarang Sharma is a Technical Officer with the Knowledge Management, Evidence and Research for Policy-making within the Division of Information, Evidence, Research and Innovation at the World Health Organization Regional Office for Europe. She has previously worked with the Editorial and Methods department of Cochrane at their headquarters and as a Senior Analyst with the National Institute for Health and Care Excellence (NICE) both in the UK, as well as a Research fellow with the Nordic Cochrane Centre and as a Health Economist with Novo Nordisk in Denmark. She is interested in supporting the use of evidence in policy-making, knowledge translation, evidence-based priority setting of health research and the inclusion of patient reported outcomes, patient experience and citizen involvement in decision-making, especially in the field of mental health. She has a PhD in Public Health and Epidemiology from the University of Copenhagen a MPH from University of Sheffield (UK) and a MS from New York University (USA).

Abstracts

Keynote lectures

Oral presentations

Poster presentations

Measuring the impact of communicable diseases: methodologies, challenges and lessons learned

Alessandro Cassini[1]

[1] *World Health Organization*

The Burden of Communicable Diseases in Europe (BCoDE) project generated hallmark estimates on the burden of infectious diseases (community-, healthcare-associated and antimicrobial-resistant) in the Europe Union and European Economic Area (EU/EEA). The project was initiated by the European Centre for Disease Prevention and Control (ECDC), and was supported by several European research groups. During his talk, Dr Cassini will introduce the initial objectives and vision for BCoDE, and present the methodological issues that had to be addressed during the project – including the estimation of true disease incidence, attributable complications (death and sequelae), duration of disability and disability weights. Several of these methodological issues were tackled through a multidisciplinary approach involving many different experts active at national and international levels. Finally, Dr Cassini will conclude by showing how the results have been disseminated and which impact they have had, and continue to have, on research and decision-making.

Estimation of burden of disease and recent developments in Australia

Richard Juckes[1]

[1] *Australian Institute for Health and Welfare*

Australia has a long and successful history in conducting country specific Burden of Disease analysis. Richard will present the history of Australia's national Burden of Disease work, including how it relates to the Global Burden of Disease work and other international studies. He will describe the most recent study: Australian Burden of Disease 2015, including a description of methods, results (overall burden, risk factors and Health Adjusted Life Expectancy), innovations, challenges and future plans.

The role of burden of disease analysis in evidence-informed policy making

Tarang Sharma[1], Tjede Funk[1], Tanja Kuchenmüller[1]

[1] *World Health Organization Regional Office for Europe*

The work undertaken by the unit of Knowledge Management, Evidence and Research for Policy-making within the Division of Information, Evidence, Research and Innovation at the World Health Organization Regional Office for Europe towards supporting the use of evidence for policy-making in the WHO European Region will be presented. In particular, the session will be based on the Health Evidence Network (HEN54) synthesis report on mechanisms and tools for the use of health information for decision-making, with burden of disease as a case study. Current work to update this review from 2017 and the development of a framework to translate health information, including burden of disease data, into policy will be highlighted.

Using temporal heat maps as a visualization tool to analyze time changes: A preliminary analysis of death and disability-adjusted life year rates in the European Union

João Vasco Santos[1,2,3], Júlio Souza[1,2], João Viana[1,2], Carlos Saéz[4], Alberto Freitas[1,2]

[1] MEDCIDS—Department of Community Medicine, Information and Health Decision Sciences, Faculty of Medicine, University of Porto, Porto, Portugal
[2] CINTESIS—Centre for Health Technology and Services Research, Porto, Portugal
[3] Public Health Unit, ACES Grande Porto VIII (ARS Norte), Espinho/Gaia, Portugal
[4] Biomedical Data Science Lab, Instituto Universitario de Tecnologías de la Información y Comunicaciones (ITACA), Universitat Politècnica de València (UPV), Valencia, Spain

Background

Nowadays, there are plenty of visualization tools allowing a quick analysis and interpretation of data. Heat maps are one of these solutions widely used in several fields, such as genetics, molecular biology but also epidemiology. We present an application of temporal heat maps, i.e. heat maps using time as one of the variables, in the Global Burden of Disease (GBD) burden of disease and injuries estimates for European Union (EU).

Methods

Using the GBD 2017 study estimates, we displayed temporal heat maps between 1990 and 2017 for age-standardized death and disability-adjusted life years (DALYs) rates in European Union, considering the 169 level 3 causes. We visually inspected time trends and abrupt changes throughout time.

Results

Visual inspection of temporal heat maps for age-standardized death and DALY rates allowed us to quickly identify some major time trends such as the decrease of age-standardized DALY rates due to tuberculosis or meningitis, the age-standardized death rate decrease due to HIV/AIDS or its increase due to bacterial skin diseases or diarrheal diseases. Abrupt changes were also observed, such as the high peaks of age-standardized death and DALY rates in 2003 due to environmental heat and cold exposure and in 1991-1992 due to conflict and terrorism.

Conclusion

Temporal heat maps showed to be an interesting method for rapid data assessments in an epidemiological context. It allows sub-analyses by all the variables that might be considered, such as age groups, sex and country. This simple visualization method can also be applied to several other fields.

Key messages

- Temporal heat maps can be used for rapid assessment of trends and abrupt changes in epidemiology such as the DALY rates
- Heat maps are particularly useful in detecting temporal patterns in big datasets

Disease burden in the Nordic region: toll of life style differs among neighbour welfare states. Results from the Global Burden of Disease Study 2017

Ann Kristin Knudsen[1,2]; on behalf of the Nordic Burden of Disease Collaborators.

[1] *Centre for Disease Burden, Norwegian Institute of Public Health, Bergen, Norway*
[2] *Department of Psychosocial Science, University of Bergen, Bergen, Norway*

Background

The Nordic countries – Norway, Sweden, Finland, Iceland, Denmark - combine liberal and open-market economies with public welfare and universal health services. As separate countries with differences in culture and lifestyle, important health differences may exist between them. The aim of this study was to compare life expectancy and disease burden by causes and risk factors in the Nordic countries, including Greenland as constituent country under Denmark.

Methods

Age-standardised overall, cause-, and risk factor-specific estimates of disability-adjusted life-years (DALYs), along with life expectancy, were analysed in the Global Burden of Diseases, Injuries and Risk Factors Study 2017 (GBD 2017). Sex and country cause-specific estimates were compared with Nordic regional estimates.

Findings

Lower life expectancy than the other countries were found for males and females in Denmark (males: 78.8 years, 95% uncertainty interval 78.1-79.5; females: 82.7 years, 81.9-83.4), and males in Finland (78.6 years, 77.8-79.2). Males and females in Greenland had much lower life expectancy (males: 70.8 years, 70.3-71.4; females: 77.2 years, 76.2-78.0) and substantially higher disease burden than the rest of the Nordic region (males: 33101.3 DALYs, 30182,3- 36218.6; females: 26666.6 DALYs, 23478.4-30218.8). Variation in DALY rates between the Nordic countries was primarily due to differences in causes associated with mortality, including ischaemic heart disease, chronic obstructive pulmonary disease, lung cancer, alcohol use disorder, and self-harm. These causes contributed more to male than female DALYs. Little variation was found between countries for non-fatal diseases, which were dominant contributors to DALYs among females. Smoking and metabolic risk factors were important risk factors across all countries. DALYs attributed to smoking and alcohol use were particularly high among males (smoking: 2717.3 DALYs, 2459.8-2973.2; alcohol use: 1955.9 DALYs, 1456.0-2505.8) and females (smoking: 1944.5 DALYs, 1731.4-2174.6; alcohol use: 619.8 DALYs, 358.2–946.2) in Denmark and males in Finland (alcohol use: 2531.1 DALYs, 1982.9–3192.4).

Conclusion

The GBD framework facilitates within-region comparisons for benchmarking exercises and can guide policy development. The comparison of disease burden in the Nordic countries illustrates how differences in risk factors may drive life expectancy and disease burden differences in high-income settings.

National burden of diseases studies using Disability-Adjusted Life Years (DALYs) measure. Evolution of methods and construction of DALY – the example of Poland, 1997–2019

Katarzyna Kissimova-Skarbek[1]

[1] Department of Health Economics and Social Security, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland

Background

The purpose of this study is to show the burden of diseases work done in Poland for over two decades applying the Global Burden of Disease (GBD) study methodology using DALY measure in the period 1997-2019 years.

Methods

Since the first publications GBD methodology is constantly being improved. Four stages can be distinguished in the GBD study development process, which have the following features:

1) GBD results released in 1993–1995: six classes of disability to estimate the average disability weights for both treated and un-treated forms of disease;

2) Results published in 1996–2009 (with disability weights based on 7 classes of disability). Both stages took into consideration additional social preferences – age weighting, discounting years lost due to death and disability, gender differentiated standard life expectancies at birth used to calculate the YLLs;

3) Work in years 2010–2012: new GBD-2010 methodology introduced and results released in 2012. This was the first significant revision in calculating DALY in that it: (i) eliminates age weights; (ii) uses a prevalence approach to calculate YLD; (iii) removes discounting of time-period lost, (iv) introduces an equal standard life expectancy for both sexes (86.6 years at birth) in order to avoid gender inequalities while assessing diseases burden and health interventions' impact;

4) The last (published) GBD-2017 and GBD-2019 estimates, ready for release at World Health Assembly in Maj 2020. Provide new and more robust evidence on the health of populations worldwide through the inclusion of an expanded group of countries and data sources for models' input. Poland has been involved from the very beginning of GBD study implementation.

Results

Examples of assessing the diseases burden in Poland are presented (methods applied and data sources used) and follow four stages described above. Stages 1 and 2: (i) Sub-national burden of diseases for 49 voivodships in Poland, (ii) Burden of selected diseases (diabetes, dementia, schizophrenia, injuries) studies using so called "Generic DALY" construction; Stage 3: Burden of Non-Communicable Diseases in Poland (DALYs, YLDs, YLLs, avoidable YLLs); Stage 4: Drivers for change in diabetes burden over period of time and Sub-national 2019 burden of diseases study for 16 voivodships.

Conclusion

Polish example can be helpful for network members to discuss how the national burden of disease study can be performed for national evidence-based policy making employing all available and acceptable data sources.

Key messages

- GBD methodology is constantly being changed, data sources and locations increased
- This avoids comparability of results from different rounds of estimates
- It is crucial to adapt the GBD methods for national diseases burden assessment

The burden of disease in Spain: Results from GBD 2016

Joan B Soriano[1,2]; on behalf of the GBD Collaborators in Spain

[1] *Hospital Universitario de la Princesa, Madrid, Spain*
[2] *Universidad Autónoma de Madrid, Madrid, Spain*

Background

The global burden of disease (GBD) project measures the health of populations worldwide on an annual basis, and results are available by country. We summarized the state of health in Spain in 2016 and report trends from 1990.

Methods

GBD 2016 estimated disease burden due to 333 diseases and injuries, and 84 risk factors. Mortality and DALYs, risk factors, and progress towards the SDGs are presented.

Results

There were 418,516 deaths in Spain in 2016, 80.5% of them in those aged 70+ years. Overall, NCDs (92.8%) were the main cause of death, followed by 3.6% injuries, and 3.5% communicable diseases. The leading causes of death were IHD (14.6%), Alzheimer's (13.6%), stroke (7.1%), COPD (6.9%), and lung cancer (5.0%). Remarkable increases in mortality from 1990 to 2016 were observed in other cancers, LRIs, CKD, and other CVD. Low back and neck pain became the top cause of DALYs in 2016, just surpassing IHD, while Alzheimer's moved to 3rd position. Overall, smoking is by far the most relevant risk factor in Spain. Finally, Spain scored 74.3 of 100 points in the SDG index classification in 2016, and the main national drivers of detrimental health in SDGs were alcohol consumption, smoking and child obesity. An increase to 80.3 points is projected in 2030.

Conclusion

Low back and neck pain were the most important contributor of disability in Spain in 2016, with a remarkable increase in the burden due to Alzheimer's. Tobacco remains the most important health issue to address in Spain.

Key messages

- Tobacco remains the most important health issue to address in Spain, responsible for 1 million lost DALYs per year
- NCDs were the main cause of death in 2016, corresponding to 92.8% of all deaths

Estimating mortality attributed to ill-defined codes of death and at national and local level in Serbia

Santric Milicevic M[1], Todorovic J[1], Rosic N[2], Vujetic M[2]

[1] *Institute of Social Medicine, Faculty of Medicine, University of Belgrade*
[2] *City Institute of Public Health of Belgrade*

Background

The Global Burden of Disease Study (2017) developed an overall rating for each country for vital registration completeness, percentage of deaths coded to causes that cannot be true underlying causes of death (garbage codes), detail of the cause list and age groups for period 1980-2016. We explored the causes of death data from the local level (Belgrade) and the national level (Serbia) to estimate the mortality attributed to ill-defined deaths (ICD-10 group XVIII) and garbage codes for the period 2016-2018.

Methods

The data were drawn from the Health Statistical Yearbooks of the Republic of Serbia, published by the Republic Institute of Public Health, 'Dr Milan Jovanovic Batut' and the database of the Institute of Public Health of the City of Belgrade.

Results

From 2005 to 2018 the crude mortality rate in Serbia increased (1430/100000 to 1460/100000), while the share of the ill-defined causes decreased from 6.14% to 4.16%. The crude mortality rate in Belgrade decreased from 1300/100000 in 2010 to 1270/100000 in 2018, the share of ill-defined causes was 5.3% in 2010 and 2018. Garbage codes (GBDs list) contribute significantly to the mortality in Belgrade (20.05% in 2016 and 23.97% in 2018).

Conclusion

All garbage codes contribute considerably to overall mortality at the local level; the ill-defined conditions much less attribute to overall mortality, but were ranked among the top five most frequent causes of death. Study shows that focusing only on improving the coding of ill-defined conditions would only partially affect the quality of mortality data.

Key messages

- All garbage codes contribute considerably to overall mortality in Belgrade.
- There is a need to focus on all garbage codes to improve quality of mortality data

Development and growth of the Italian Global Burden of Disease Initiative

Lorenzo Monasta[1], Cristiana Abbafati[2], Ettore Beghi[3], Francesco Saverio Violante[4], Giancarlo Logroscino[5], Giuseppe Remuzzi[3], Miriam Levi[6], Massimo Cirillo[7], Norberto Perico[3], Boris Bikbov[3], Filippo Ariani[6], Andrea Farioli[4], Luca Ronfani[1]

[1] *Institute for Maternal and Child Health – IRCCS Burlo Garofolo, Trieste, Italy*
[2] *La Sapienza University, Roma, Italy*
[3] *Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Milano, Italy*
[4] *University of Bologna, Bologna, Italy*
[5] *Univeristy of Bari "Aldo Moro", Bari, Italy*
[6] *Local Health Unit Toscana Centro, Firenze, Italy*
[7] *Univeristy of Naples "Federico II", Napoli, Italy*

Background

The Burden of Disease approach has spread significantly, especially since the launch of the GBD project by IHME in 2007. Researchers from different Countries have taken different approaches to national BoD estimates, with some Countries taking official positions regarding the development of own estimates or the engagement with IHME. In Italy, since early 2016, a small group of GBD collaborators started working together independently, to improve the exchange with IHME and, consequently, the estimates generated for Italy.

Methods

The Italian group shared common objectives: 1) share different knowhow and experiences, and coordinate activities related to production and revision of GBD estimates for Italy and areas of expertise; 2) disseminate GBD estimates at national and regional level, and stimulate the active participation of health planners; 3) intensify the sharing of data and information with IHME and reach an agreement with IHME for the production of sub-national estimates; 4) elaborate joint research projects to cover data gaps.

Results

The Italian group has reached 80 collaborators. In October 2018 IHME agreed to generate sub-national estimates, which we are now reviewing and will officially be published in 2021. A throughout analysis of the epidemiological situation in Italy was published in November 2019. Other articles are being submitted. Researchers are structured in thematic working groups. Regions are now being involved to start approaching regional estimates and contribute to their revision.

Conclusion

Despite the lack of active Governmental involvement, the Italian network is growing and significantly contributing to the improvement of GBD estimates for Italy and globally.

Key messages

- The network improves the exchange with IHME and impacts on the quality of estimates
- This organized effort increases ownership and spendability of estimates for planning

Does the choice of life table in Burden of Disease studies impact how causes are ranked?

Grant MA Wyper[1], Georgia MC Dyer[2], Eilidh Fletcher[3], Ian Grant[3], Gerry McCartney[1], Diane L Stockton[1]

[1] Public Health Science Directorate, NHS Health Scotland, Glasgow, Scotland
[2] Faculty of Medicine, Lund University
[3] Information Services Division, NHS National Services Scotland, Edinburgh, Scotland

Background

A fundamental decision in Burden of Disease studies is the life table used to translate mortality counts into Years of Life Lost (YLL) estimates. The Global Burden of Disease (GBD) study uses an aspirational life table for all countries, whilst our Scottish Burden of Disease (SBoD) study opted to use national life tables. The aim of this study was to evaluate how disease Disability-Adjusted Life Years (DALYs) ranks differed between YLL constructed using national life tables compared to those constructed using the GBD aspirational life table.

Methods

Estimates of DALYs for 68 causes of disease/injury were obtained from the SBoD study, reflecting a 3 year average across 2014-16. YLL was calculated using sex-specific national life tables. Comparative DALYs were then calculated with YLL estimates derived using the GBD 2016 aspirational life table. The main study outcome was to describe how the rank of causes, based on number of DALYs, varied dependent on the method used.

Results

The leading 20 causes were the same under both methods, although the ranking varied. Lower back and neck pain and depression were the second and third leading causes in the SBOD study. They dropped to fifth and sixth respectively when the GBD life table was used, whilst lung cancer and cerebrovascular disease became the second and third leading causes.

Conclusion

The choice of life tables has large implications for how we value YLL in relation to YLD. The choice of life table remains a contentious area for which further research is required.

Key messages

- Ranks of the leading causes of YLD are sensitive to the choice of life table used
- Scottish national life tables led to higher ranks of the leading causes of YLD

Disease burden calculation in the health impact assessment of the anti-smoking legislation proposal in Hungary

Balázs Ádám[1], Ágnes Molnár[1], Róza Ádány[1]

[1] *Department of Preventive Medicine, Faculty of Public Health, Medical and Health Science Center, University of Debrecen, Hungary*

Background

A major goal of anti-smoking programmes is the protection of non-smokers from environmental tobacco smoke (ETS) exposure. In addition to increasing taxes, smoking restriction in public places is the most effective measure for the reduction of smoking-related morbidity and mortality. After several countries introduced comprehensive anti-smoking policies, in 2009 Hungarian political decision-makers also realized the need for amending the existing anti-smoking legislation by enacting full restriction of smoking in public places.

Methods

A comprehensive, prospective health impact assessment was carried out, aiming to assess the impact of planned legal changes, using international experiences, epidemiological data and known association measures for the qualitative and, where applicable, quantitative assessment that expressed health outcomes in changes of attributable deaths and disability-adjusted life years (DALY).

Results

The proposal was found to decrease ETS exposure that positively affects air quality, built environment and workplace conditions especially for non-smokers who can experience reduction in lung cancer, coronary heart diseases, stroke and chronic pulmonary diseases. The amendment would also decrease cigarette consumption that has considerable positive effects on a wide range of diseases, among them the ones reduced by decreased ETS exposure and have the greatest public health importance. The health gain calculated for the quantifiable health outcomes was close to 1,700 attributable deaths postponed and 16,000 DALYs saved annually in Hungary.

Conclusion

The provision of smoke-free public places has an unambiguous positive impact on the health of public, especially in a country with high burden of smoking-related diseases, like Hungary.

Key messages

- Disease burden calculations can be used to support quantitative health impact assessment
- Total ban of smoking in closed public places has substantial positive health impact on the population

Substituting red meat with pulses in the Danish diet: The impact on disease burden

Freja A Fabricius[1], Sofie Theresa Thomsen[1], Maarten Nauta[1]

[1] *Division of Diet, Disease Prevention and Toxicology, National Food Institute, Technical University of Denmark (DTU), Kgs. Lyngby, Denmark*

Background

The Danish food-based dietary guidelines advise the Danish population to increase consumption of vegetables while decreasing consumption of red meat, e.g. by substituting red meat by pulses. However, quantitative estimates of the health impact of such substitution is lacking. We aimed to investigate the health impact of substituting red meat by pulses in the Danish diet by comparing the change in disease burden attributable to nutritional risk factors and chemical exposures.

Methods

The health impact of substituting red meat by pulses was modelled for the Danish population (4-75 years) in the terms of Disability-Adjusted Life Years (DALY), based on national consumption data and food monitoring. We defined four substitution scenarios and compared current dietary patterns with a 25%, 50%, 75% and 100% substitution.

Results

We estimated an overall health gain of the substitution with an increasing benefit with increased substitution. Up to 118 (95% UI 85; 148) DALYs/100,000 per year could be averted by a 100% substitution. A decreased burden of Ischaemic Heart Disease due to increased pulse consumption contributed most to the health benefit with up to 44 (95% UI 17; 69) DALYs/100,000 averted per year. However, the substitution would also increase the disease burden of intellectual disability due to increased lead exposure in children (up to 1.7 (95% UI 0.3; 3.5) DALYs/100,000).

Conclusion

This study estimated an overall health gain of substituting red meat by pulses in all substitution scenarios for the Danish population. However, public health strategies should consider variability in health impact between subgroups.

Key messages

- Substituting red meat by pulses would decrease the burden of disease in Denmark
- Main benefit estimated from decrease in ischemic heart disease and type 2 diabetes

Report of pilot workshop 'Estimating the national burden of foodborne disease'

Lucie C Vermeulen[1], Joke van der Giessen[1], Juanita Haagsma[2]

[1] WHO Collaborating Centre Risk Assessment of Pathogens in Food and Water, hosted by the National Institute for Public Health and the Environment (RIVM), the Netherlands
[2] Erasmus MC, the Netherlands

Background

Foodborne diseases are an important cause of morbidity and mortality but the full extent is unknown. Calculating the foodborne burden of disease (BoD) is helpful for setting priorities in health risk management.

In 2005 the WHO Foodborne Burden of Disease Epidemiology Reference Group (FERG) initiated first ever estimates of the global and regional burden of foodborne disease. The results were published in a report and six publications and a symposium was organized in 2015. Additionally, FERG promoted actions at a national level, including capacity building through national foodborne BoD studies.

To continue work on national foodborne BoD after FERG, a workshop by was developed and piloted by the WHO Collaborating Centre Risk Assessment of Pathogens in Food and Water. The aim of this workshop is to assist WHO in strengthening the capacity of countries in conducting foodborne BoD assessments and to increase the number of countries that have undertaken a foodborne BoD study.

Methods

Students work in a hands-on setting, alternating between lectures and practical work. Learning goals include:

- How to calculate the foodborne BoD using software tools (BCoDE)
- To work with the concept of Disability Adjusted Life Years (DALYs)
- To perform a stakeholder analysis for the food sector
- How to approach setting a national foodborne BoD study
- Knowledge translation

Results

Students of the pilot workshop evaluated the course very well, giving an average rating of 4.4 out of 5.

Conclusion

A workshop has been developed to strengthen the capacity of countries in conducting foodborne BoD assessments.

Key messages

- A capacity building workshop on national foodborne BoD has been developed
- Students of the pilot workshop evaluated the course very well

Computing the burden of infectious diseases in an ageing population: Accounting for competing mortality risks

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Background

The mortality burden of influenza or other infectious diseases relatively common among the elderly is challenging to determine. The presence of co-morbid conditions can affect background mortality risk and therefore life expectancy, and so standard approaches for computing years of life lost (YLL) may lead to overestimation of the burden.

Methods

We estimated influenza-attributable mortality burden in adults 60+ years of age in the Netherlands in terms of YLL, comparing 'standard' YLL computation with YLL taking competing mortality risks into account. To estimate deaths due to influenza, weekly laboratory surveillance data for influenza and other respiratory pathogens and weekly extreme temperature served as covariates in Poisson regression models fitted to weekly age-group specific mortality data for the period 1999/2000 through 2012/13. Mortality burden for age-groups 60-64 through 85-89 years was computed as years of life lost before age 90 (YLL90) using simulation and restricted mean lifetimes survival analysis.

Results

Influenza-attributable YLL90 was highest among age-groups 80-84 and 85-89 years (914 YLL90 per 100,000 persons, 95% uncertainty interval(UI): 867:963 and 787 YLL90/100,000, 95% UI: 741-834). Ignoring competing risks in the computation led to substantial over-estimation of burden, from 3.5% for 60-64 years to 82% for persons aged 80-89 years at death.

Conclusion

Particularly for the oldest age-groups, who have a high prevalence of multi-morbidity, it appears vital to compute YLL for influenza treating death from other causes as competing risks. Future work will investigate how heterogeneity in mortality risk – recognising the distribution of multi-morbidity – can be handled in this framework.

Key messages

- In the context of population ageing, for assessment of potential prevention initiatives policy-makers require accurate information regarding the burden of infectious and chronic diseases in the elderly
- Failure to account for competing mortality risks has implications for the accuracy of infectious disease burden estimates, particularly for the oldest age-groups

Application of a new methodology and R package reveals a high burden of healthcare-associated infections (HAI) in Germany compared to the average in the European Union/European Economic Area, 2011 to 2012

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Background

Healthcare-associated infections (HAIs) pose a major challenge to healthcare systems.

We estimated the burden of five common types of HAI in Germany, including healthcare-associated pneumonia (HAP), healthcare-associated urinary tract infection (UTI), surgical site infection (SSI), healthcare-associated Clostridium difficile infection (CDI), and healthcare-associated primary bloodstream infection (BSI).

Methods

This study builds on the approach of the Burden of Communicable Diseases in Europe (BCoDE) project and data from the European Centre for Disease Prevention and Control (ECDC) point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals 2011-2012.

Results

We estimated that 478,222 (95% UI: 421,350 - 537,787) new cases of the selected types of HAIs occur each year in Germany, resulting in 16,245 (95% UI: 10,863 - 22,756) attributable deaths and 248,920 (95% UI: 178,693 - 336,239) DALYs. The health burden of these five types of HAI in Germany was substantially higher than the burden of any other communicable disease. Although Germany had a relatively low HAI prevalence in acute care hospitals compared to other European Union/European Economic Area (EU/EEA) countries, the burden of HAIs per 100,000 population was higher than the EU/EEA average.

Conclusion

This is the first study that estimates the burden of HAIs in Germany expressed in DALYs. A probable cause for the high health burden of HAIs in Germany is the country's large hospital patient population. Germany has the highest number of curative beds in Europe. Thus, identification and reduction of avoidable hospital stays could potentially reduce the burden of HAIs in Germany. The open-source R package that was developed for this study will allow other countries to estimate their national burden of HAIs following our methodology.

Key messages

- HAI-burden of disease estimation helped to identify important target for prevention
- Toolboxes for modelling BoD should be understandable and modifiable

Dietary exposure to Cadmium and the associated burden – results from a duplicate diet study in Portugal (2012)

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Background

Cadmium is a toxic metal classified as human carcinogen (Group 1) and considered an endocrine disruptor. Human exposure in the non-smoking general population occurs mainly via food ingestion. In order to evaluate the levels of Cd exposure trough food intake in Portugal and the associated burden, a duplicate diet study was conducted in the city of Aveiro, Portugal, in 2012.

Methods

Duplicate diet samples were obtained for seven days from 30 individuals from Aveiro in 2012. Cadmium levels were quantified by inductively coupled plasma mass spectrometry (ICP-MS). Assuming this exposure as representative of the exposure to Cadmium of the Portuguese population, the Disability-Adjusted Life Years (DALYs) were estimated for the age group 20 – 59 years old.

Results

Cadmium was detected in all analyzed food samples with values ranging from 6.6 to 212 $ng.g^{-1}$ wet weight (median 9.16 μg kg bw^{-1} $week^{-1}$). The estimated dietary weekly intakes varied from 1.1 to 48 μg kg bw^{-1} $week^{-1}$ (median 1.92 μg kg bw^{-1} $week^{-1}$). Dietary intakes of Cadmium higher than the tolerable weekly intake were registered in 30% of the participants.

DALYs associated to the dietary exposure to Cd of the studied Portuguese population were estimated as 99.61. Despite the associated uncertainties, the obtained result constitutes the first approach to the characterization of the health impact of dietary exposure to Cd in the Portuguese population.

Conclusion

Food is an important source of cadmium to the non-smoking general population and preventive measures should be implemented to reduce the burden associated with this toxic metal.

Key messages

- Cd levels were quantified in duplicate diet samples (7-days) from Portugal
- DALYs associated with Cd dietary exposure were estimated at 99.61

Disability weights for the calculation of DALYs: A new approach to evaluate the efficacy of countries' policies

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Background

The estimation of the DALYs, and specifically of the YLDs component, requires the calculation of disability weights (DWs). Current approaches usually apply the same criteria to the entire world population (e.g. GBD study; WHO GBD); the same DWs are applied to all Countries. This choice respects a principle of equity. We share this point of view. However, this approach does not provide information on how much national policies aimed at mitigating disability effects contribute to decreasing DALYs. The use of non-standard DW would allow a comparison between Countries and within Countries and over time to evaluate the possible impact of policies aimed at mitigating disabilities.

Methods

We propose to create a panel of experts (including people with a background on both social and medical sciences) to select specific policies to be used as case studies (e.g.: investments to decrease/eliminate architectural barriers; tactile paving to assist visually impaired pedestrians; policies for return to work of cancer patients). Then, the panel will establish how much each policy reduces the DW and will propose non-standard DW to be applied by period and Country based on implemented policies. Our results will be compared with main findings from the standard approach to determine which policies might substantially impact the burden of disease in the EU.

Expected Results

The proposed secondary analysis based on non-standard disability weights will allow to evaluate the effectiveness of policies aimed at mitigating disabilities. A list of recommend actions will be presented.

Key messages

- Policies to mitigate disabilities might have a major role in determining DALYs
- A comparison between EU countries might identify high-priority policies

Estimating the incidence and under-reporting of diarrheal disease in the general population of four African LMIC (Ethiopia, Mozambique, Nigeria, and Tanzania): The FOCAL population survey

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Background

Foodborne illnesses (FBIs) impact 1 in 10 people globally, each year. FBIs are most severe in low-and-middle-income countries (LMIC), mainly African LMIC. Diarrhea and vomiting are the most common symptoms of FBIs. Data unavailability on diarrheal illnesses in African LMIC – limits informed decision making. The overall aim of the FOCAL population survey is to describe the epidemiology of acute diarrhea in the general population in Ethiopia, Mozambique, Nigeria, and Tanzania.

Methods

We will conduct a cross-sectional population survey, to collect retrospective, self-reported data on the occurrence of common symptoms of FBI (e.g., vomiting, diarrhea). Data collection will span 24 months, to capture seasonal variation in FBI occurrence. The population survey will take place in one rural and one urban community. The target minimum sample size is 550 per community. The target population is the general population (i.e., all community members). The survey tool is comparable to other diarrheal disease population surveys conducted in Canada, Denmark, Germany, Ireland, Italy, and New Zealand. Data will be collected using an online platform, via smartphone or face-to-face using data collectors. During data collection, we will use a broad definition (any diarrhea) for high sensitivity and case capture; and during analysis, we will apply various definitions for comparability with other studies. We will explore weighting by age and sex to the population in the selected study area. Ethical approval of the protocol is taking place at multiple review boards in multiple institutions in the countries.

Funding

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GBD data for health care planning – the importance to account for disproportions in prevalence and disability-adjusted life-years

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Background

Global burden of disease (GBD) data are important source of information for health care planning. The disability-adjusted life-years (DALYs) were proposed as a summary metric of disease burden, and many publications focus primary on DALYs. However, some diseases could have disproportional DALYs compared to prevalence that should be accounted during decision making.

Methods

We explored the GBD 2017 estimates for 163 third-level causes of morbidity and mortality, considering all-age rates of DALYs and prevalence at the global level, excluding acute conditions with zero prevalence.

Results

The correlation between prevalence and DALYs rates was moderate (Spearman's r = 0.56, $p<0.0005$). The median difference between rates was 162.7 (IQR -12.9 to 1312.0) per 100,000 population, indicating higher prevalence compared to DALYs. This difference was positive for 112 and negative for 51 causes.

We further explored the top-20 globally most prevalent causes. The prevalence rates were more than 100 times higher than DALYs rates for oral disorders, hemoglobinopathies, sexually transmitted infections, intestinal nematode infections, fungal skin disease due to their temporary nature or low impact on overall health. However, for such chronic conditions with high impact on personal and public health as tuberculosis, liver cirrhosis, chronic kidney disease, and diabetes mellitus the prevalence rates were 7 to 42 times higher compared to DALYs rates.

Conclusion

Health care planning should account to all disease burden metrics and consider not only DALYs but also prevalence. The reasons of extreme disproportion between different metrics for chronic disease with high burden should be critically evaluated.

Key messages

- For diabetes, chronic liver and kidney diseases prevalence largely exceeds DALYs
- Health care resources planning should account for all disease metrics

Disease-specific research funding and burden of disease: A comparative study

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Background

Measures of disease burden including mortality, years of life lost, and disability adjusted life years (DALYs) are essential for priority setting regarding research funding. Previous studies indicate that country specific DALYs is the single most predictive variable of research funding. In this study, we investigate the alignment between disease burdens with research funding and compare public research funding for migraine research to that for other diseases chosen to represent the full spectrum of DALYs, both on global and country-specific levels.

Methods

We extracted publicly available data on global and country-specific burden of disease and public research funding in the USA and Sweden and employed linear regression to assess the alignment of disease-specific public research funding with burden of disease (DALYs). We further compared the funding for migraine with diseases of diverse burden.

Results

Country-specific burden of disease accounted for 40.6% and 43.2% of the variance of public research funding in Sweden in the years 2017 and 2018 respectively while 26.4% in 2017 and 25.8% in 2018 of variance in disease-specific funding by NIH was accounted for by the burden of disease in the USA. Migraine in both countries was underfunded compared to diseases of similar and even lower burden of disease such as asthma and autism.

Conclusion

Public research funding in the United States was more aligned with global burden of disease as opposed to Sweden where public research funding was more aligned with country specific burden of disease

Key messages

- DALY is an important predictor of disease research funding
- Global and country-specific DALYs correlates differently with disease research funding

Burden of neoplasms in Portugal (2007-2017)

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Background

Within the UN's Sustainable Development Goals (SDG), SDG 3 aims to reduce the number of premature deaths due to non-communicable diseases (NCD). Within NCD, cancer has a significant impact on life expectancy and quality of life of populations, being currently a societal problem for European countries. In fact, the EU has elected cancer as one of its research missions under Horizon Europe.

Methods

We used the Global Burden of Disease study data to describe neoplasm incidence, mortality, years lived with disability (YLDs), years of life lost (YLLs), and disability-adjusted life years (DALYs) in Portugal over the period 2007-2017.

Results

In 2017, there were 670.448 (59.893-75.748) incident cases (20,6% increase from 2007), 29.599 (28.062-31.195) deaths (virtually unchanged from 2007), and 565.791 (532.976-597.784) DALYs due to cancer (unchanged from 2007).

In 2017, "other neoplasms", skin, colorectal, prostate and breast cancers were the most incident etiologies (both sexes). In men, the most relevant were "other neoplasms", prostate, skin, colorectal and lung cancers, while in women they were "other neoplasms", breast, skin cancer, colorectal and uterine cancers.

Neoplasms were responsible for 18.03% (15.83-20.4) DALYs in the country, being the leading contributor. Overall, 26.02% (25.38-26.65) of all deaths in 2017 were attributed to neoplasms.

Conclusion

Among high sociodemographic index countries, cancer-related DALYs and deaths have increased 7.4% and 12.8%, respectively, in 2007-2017. This is not the trend found in Portugal, where neither factor increased, despite the 20% increase in incident cases. These results are relevant for their potential implications for future policy choices and assessment of ongoing programs.

Key messages

- Neoplasms were responsible for 18% of DALYs in Portugal in 2017
- Overall, 26.02% of all deaths in 2017 were attributed to neoplasms

Health effects of dietary risks in Portugal

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Background

A growing body of research has shown direct relation between suboptimal diet and several non-communicable diseases (NCDs). Understanding the risk-outcome associations between dietary risks factors and such NCDs can be used to efficiently prevent health loss and guide policies.

Methods

We used the Global Burden of Disease study 2017 numbers to highlight the risk-outcome associations of the most relevant dietary risk factors with diabetes mellitus', neoplasms' and cardiovascular diseases' attributable deaths and disability-adjusted life-years (DALYs) among adults, in Portugal.

Results

In 2017, 16.329 deaths and 299.077 DALYs were attributable to dietary risk factors. Low intake of whole grains (5.226 deaths and 110.427 DALYs), low intake of fruits (3.139 deaths and 63.293 DALYs), low intake of nuts and seeds (2.819 deaths and 52.880 DALYs), and high intake of sodium (2.444 deaths and 42.399 DALYs) were the leading dietary risk factors for deaths and DALYs in Portugal. Cardiovascular diseases were the leading cause of diet-related deaths (13.008 [14.652–11.431]) deaths and DALYs (189.446), mainly due to low intake of whole grains, fruits and, nuts and seeds (9.724 deaths and 150.257 DALYs). Cancer was the second cause of diet-related deaths (2.238) and DALYs (41.699) and type 2 diabetes closed the top-3 (966 deaths and 65.174 DALYs).

Conclusion

This overview provides a broad picture of the potential impact of dietary habits on the most relevant NCDs for Portuguese society, highlighting the need to draw awareness to the critical relation between diet and health, as well as, to accommodate some new dietary guidelines for strategic health planning.

Key messages

- Cardiovascular diseases were the leading cause of diet-related deaths
- Cancer was the second cause of diet-related deaths

Alcohol misuse and illicit drug dependence research and disease burden in Europe

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Background

Alcohol misuse imposes a disease burden of 5.5% of the European total (measured in DALYs) because of factors external to the patient, such as interpersonal violence, road traffic accidents, and foetal alcohol syndrome. The burden of drug dependence is about 0.8% of the European total.

Methods

We conducted a bibliometric study using the Web of Science (WoS) of research on alcohol misuse and drug dependence in 2002-18 in order to compare research outputs with the volume of biomedical research and the disease burden. We also determined the impact of this research through citations on research papers and the references on clinical practice guidelines (CPGs).

Results

Alcohol misuse research, relative to all biomedical research, has been steadily declining, and was only about 0.28% in 2018, or one twentieth of the disease burden percentage. Drug dependence research, by contrast, has relatively increased slightly and is now nearly equal as a percentage of biomedical research to the percentage of the disease burden. The research cited on CPGs was largely from the USA, but several European countries were relatively over-cited compared with their presence in the subject areas.

Conclusion

The relative lack of research on alcohol misuse, a serious social problem, calls for a much greater effort in individual European Member States and for more co-ordination of research between them. In particular, work is needed on prevention measures, such as minimum pricing and the control of advertisements, and their evaluation, and better treatment for binge drinkers.

Key messages

- Illicit drug research appears to be adequate relative to the European disease burden
- Alcohol misuse research is twenty times less that of its European disease burden

Complete denture based prevalence estimation of edentulism for the Dental Clinic of Vojvodina in the 2008-2019 period

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Background

There is a lack of information about edentulism as a "final marker of disease burden for oral health" in Serbia. The aim of this study was to investigate the prevalence of edentulism based on the data on prosthetic rehabilitation by complete dentures at the Dental Clinic of Vojvodina as a tertiary referral health institution.

Methods

Database of all groups of patients in the 2008-2019 period at the Prosthetic Department of the Dental Clinic of Vojvodina, was used as an input for estimation of prevalence of edentulous patients based on the number of complete dentures constructed. A total sample of 70 956 patients was examined using IBM SPSS Statistics 25, including 2 672 patients restored with complete dentures (42.7% male, 57.3% female, mean age 64).

Results

Between 2008 and 2019, the age-standardized prevalence of complete dentures constructed has increased from 3.7% to 4.7%, presumably indicating an increase in the number of edentate people. For both sexes, prevalence increased gradually with age, with a peak at the interval of 65-74 years (52.4% were older than 65 years). The majority of patients (55.3%) had out-of-pocket expenditure, signalizing a rising demand for relevant oral health policies.

Conclusion

Acting as policy advisors for Public health institutions, we could contribute to the improvement of Oral health status monitoring in Serbia. Bearing in mind the possible estimation of DALYs based on YLDs only as reported by others, we are looking forward to a realistic outcome of DALYs calculation in the upcoming period.

Key messages

- Inadequate monitoring of population oral health status in Serbia
- Estimated prevalence could provide aliment for future disease burden measurements

Burden of injuries: High sensitivity to selection criteria of what worth to be considered "permanent" disability

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Background

In the GBD study, YLDs of not fatal injuries are evaluated considering, for each injury category, a specific proportion of cases leading to permanent disability.

The Italian regional data on occupational injuries, based on individual insurance data, offer ample coverage and avoid overlaps with other areas. Each case contain details on injury type and duration. Permanent disabilities are not expressed as a dichotomous variable, but on a scale variable in single units ("GI") between 0 and 100, considering effects on overall health status.

Methods

Some 1.3 mln. injury records occurred in Tuscany 1990-2015 with complete data on injury type, were linked with GBD injury categories. YLLs and YLDs for temporary disability were calculated considering life expectancy, DWs and individual duration. YLDs for permanent disabilities were calculated progressively reducing the thresholds of inclusion from 11 to 1 GIs.

Results

Total YLLs were 59.4k, total YLDs for temporary disability were 3.4k

YLDs for lifelong disabilities increased with threshold reduction, from 64.6k to 242.9k.

This depends on the severity distribution of disabilities: 86% cases had no permanent disability, 3.6% had obvious permanent disability (>10GI), 10.4% were questionable mild disabilities, causing large effects on YLDs if calculated or not for the whole remaining life expectancy.

Conclusion

Calculation of YLDs caused by injuries is highly sensible to the evaluation criteria of what worth to be considered permanent disability. The argument is derived from occupational injuries but can be applied to all injuries and influences their total weight compared to other GBD causes.

Key messages

- Selection of "permanent" disabilities is a key point in estimating YLDs for injuries
- Such choice is not an easy binary one, and instead requires delicate evaluations

Data linkage between two different data sources on occupational fatal injuries

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Background

Fatal occupational accidents are a propriety for public health. In Italy, the main data source about occupational injuries, is the Institute of Insurance for Occupational Illness and Injury (INAIL). This registration system is one of the most complete in Europe. On this specific issue, it is the main source for Italian data considered in Eurostat, Ilostat and GBD.

Nonetheless, previous studies have identified some limitation of this sources when comparing collected data with those of other registries.

Previous researches conducted in Tuscany (Italy) revealed that, in 1997-2002, INAIL archive included about 60% of the total cases of fatal accidents, when comparing with the Regional Mortality Registry (RMR). An assessment for the following years has not been conducted by now.

The aim of this study is to verify the completeness of the data on occupational fatal accidents collected by INAIL in Tuscany in 2002- 2016, in order to estimate the total number of cases really occurred in that period.

Methods

The study is in progress. A linkage between the INAIL data and those registered by the RMR will be conducted. Cases will be identified from each sources, and then the capture-recapture methods will be applied to estimate the number of fatal occupational deaths. Completeness of each data sources by sector will be assessed.

Results

The results will confirm or not the underestimation of INAIL in counting fatal occupational deaths.

Conclusion

This study will provide elements to correctly assess the burden of fatal occupational deaths

Key messages

- The number of fatal occupational deaths registered in insurance databases is underestimated
- The linkage of different data sources could be useful to assess the burden of this phenomenon

Estimate of injury burden caused by commuting accidents through linkage of different data sources

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Background

Commuting accidents are connected to a considerable proportion of injury burden. In Italy, 2017, the GBD study attributes to occupational factors a 13,63% of total DALYs for transport injuries. For same year, the Institute of Insurance for Occupational Illness and Injury (INAIL) indicates that 26.6% of occupational recognized fatalities were commuting accidents.

Some doubts concern the proportion of commuting injuries correctly declared by the victims to INAIL. Insurance of industrial workplace has a long tradition, with large coverage dating since early '900 and stabilized social habits of injury claims. Instead commuting accidents are recognized only since 2001, indemnification is often disputed and this may to a lower declaration rate

Local health emergency data since 2017 onward, with details regarding nature of injury, anatomical location and injury cause (like commuting accidents) are now accessible in Tuscany using the so called "SISPC" data system.

Methods

The study is in progress. Local health emergency SISPC data will be filtered to select those caused by commuting accidents. A linkage between such data and commuting accidents declared to INAIL for the same year will be conducted.

Cases will be identified from each sources, and then the capture-recapture methods will be applied to estimate the number of commuting accidents, assess the completeness of each data source, and estimate the proportion of commuting accidents correctly declared.

Results

The results will confirm or not the underreporting of commuting accidents to INAIL.

Conclusion

This study will provide further elements to correctly assess the burden of commuting accidents.

Key messages

- Commuting accidents and their injury burden could be underreported in INAIL data
- The linkage of different data sources could improve estimates of this phenomenon

Gender, nationality and job position differences in burden for occupational injuries

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Background

The GBD study perform a "top down" distribution of the total mortality and pathology data among causes and risk factors, avoiding overlaps and gaps and considering distributions for sex and age.

The Italian regional individual insurance data on occupational injuries offer ample coverage and avoid overlaps with other areas. In this case a "bottom-up" estimate should lead to similar total results, accompanied by richer details on injury types, duration, long term consequences, individual job positions and nationalities, economic sectors, accident circumstances.

Methods

Some 1.8 mln. injury records occurred in Tuscany1990-2015 were linked with GBD injury categories. YLLs and YLDs were calculated considering life expectancy, DWs and individual durations, then distributed for nature of injury and individual variables.

Results

Feminine proportion of total burden is 15.7%, higher (>20%) for most fractures and minor burns, lower (<10%) for more lethal categories (high YLL/DALY ratio) and eye injuries.

Female proportion of N.injuries increased (18% to 31%), mean DALY/event decreased (0.19 to 0.12) and burden shifted toward white collar roles, while for males remained anchored to blue collars.

For foreign workers, burden proportion increased 2000 onward (8,3% to 20,4%) and for both sexes mean DALY/event and proportion pertaining to blue collars are higher.

Mean DALY/event since 2000 is increasing for all blue collars (+67%) while mildly degreasing for whites (-8%).

Conclusion

Occupational injuries and job roles show strong gender and nationality dimensions with complex temporal dynamics. Interactions with economic sectors and accident circumstances should be deepened in order to plan targeted preventive actions.

Key messages

- Occupational injury burden and job roles, are different for males and females
- Temporal dynamics and interactions with nationality should be deepened

Subnational burden of occupational injuries occurred in Italy, 1976–2017

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Background

Recent editions of GBD study offer subnational estimates for many countries.

Regarding Italian occupational injuries, main data used in current GBD model consider this nation as a whole. Local details are available only for total injuries and population, so missing local economical and technical particularities, known to cause differences in injury rates.

Italian INAIL estimates report indemnified events occurred in each region since 1976, divided by compensation category: temporary disabilities (TE), permanent disabilities (PE), fatalities of workers with (MC) and without (MS) survivors entitled to compensation. Individual insurance data permit to calculate mean DALY/event for such categories, thus permitting to estimate local burden.

Methods

1.8 mln. individual injury records occurred in Tuscany 1990-2015 were transcoded in GBD injury categories. YLLs and YLDs were calculated considering life expectancy, DWs and durations, then distributed by compensation category.

Proportion of MC fatalities, not reported by INAIL prior to 2001, was estimated considering Tuscan data 1990–2017 and national data 2001-2017.

Results

In 1990-2000 mean DALY/event for each category was MC=40.60; MS=52.55, PE=1.97; TE=0.058. Since 2001 onward, was MC=39.34; MS=51.58; PE=1.84; TE=0.019

In 2017, total burden was 95564 DALYs. The highest local value was observed in Lombardia (13407 DALYs or 14.03% of total) the lowest in Valle d'Aosta (174.7 DALYs, or 0.18%)

MS fatalities corresponded to 28.4% of MC fatalities.

In 1976, burden was 253203 DALYs, about 2.65 times higher than nowadays.

Conclusion

Local burden varies largely among regions and over time. Insurance data permit reliable estimates since 1976 onward.

Key messages

- INAIL data are irreplaceable for Italian regional estimates of occup. injury burden
- Local burden varies largely among regions and can be estimated since 1976

Road safety and burden of road traffic injuries in Republic of North Macedonia

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Background

Road traffic injuries (RTIs) are a serious public health problem in Republic of North Macedonia (Macedonia). The main objective was to analyze the burden of RTIs in Macedonia.

Methods

Burden of RTIs on national level has been estimated in a retrospective study for 2015 and 2017 applying WHO standard method and software application. Data from Ministry of Internal affairs, State Statistical Office and medical records for RTIs have been used.

Results

The estimated burden of RTIs in 2017 is 4.894 DALYs (3.157 YLLs and 1.737 YLDs) which is lower than in 2015 with 4 960 DALYs lost (3 134 YLLs and 1 826 YLDs). There is strong correlation with sex and age. The burden of RTIs is significantly higher in males, with three times more DALYs lost than in females in 2017 ($\chi^2 = 28$, df = 1, $p < 0,01$). The most vulnerable are younger at age group 15-29 years with the most DALYs lost or 4.4 DALYs per 1000 in 2017. There is no significant difference between Macedonia and Europe in RTIs participation in the total burden of disease and injury in 2017 (coefficient of determination r2 = 0.9784, correlation coefficient (r) = -0,6128 and p = 0.2671).

Conclusion

Road safety has been set as priority for the Government for evidence based policy interventions such as national strategy and legislation development, but still their enforcement should be strengthened to improve road safety.

Key messages

- Regular estimation of RTIs burden is crucial for evidence based road safety policy interventions
- Monitoring of legislation endorsement to enhance road safety

Low back pain in European Countries; is the burden explained by known risk factors?

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Background

According to the Institute for Health Metrics and Evaluation, in the European Union (EU), LBP accounted for 6.05% of disability-adjusted life year (DALYs) in 2017. The risk factors explaining the burden would be smoking (1.45% of total DALYs), occupational ergonomic factors (1%), and overweight/obesity (0.53%). However, most of the burden (58.65%) remains unattributed. We aim to: 1) improving the definition of LBP, considering the wide spectrum of manifestations and gravity; 2) expanding the list of risk factors based on best available knowledge; 3) maximizing the use of exposure data generated in the EU (for instance, data from the European Working Conditions Survey).

Methods

Establishment of a European Network of experts in the field of LBP. A systematic review will be conducted on the different manifestations of LBP, to identify the proportion of each manifestation in population and by age and sex. An overview of the scientific literature on all putative risk factors for LBP will be conducted. Specific systematic reviews will be carried out for those factors deemed to be relevant for the attribution of DALYs. All information collected by European institutions will be inspected to retrieve data on exposure prevalence to LBP risk factors in the EU. Finally, the burden of LBP will be estimated.

Expected results

Working on the case definition of LBP and incorporating all European exposure data will contribute to increasing the fraction of DALYs attributable to preventable risk factors. Also, a better picture of the burden of LBP across EU will be derived.

Key messages

- Most of the burden of LBP, a major cause of DALYs in the EU, is unexplained
- A specific European action is needed to identify preventable causes of LBP

World cancer research: Does it reflect the disease burden?

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Background

Cancer research is the largest component of biomedical research world-wide, and ideally its geographical distribution, and that of work directed to particular anatomical sites, should take account of the disease burden in different countries, which is normally measured as Disability-Adjusted Life Years (DALYs).

Methods

We determined the volumes of biomedical research papers in the Web of Science (WoS), the volumes of cancer research, and the numbers on six individual sites (breast, colorectal, liver, lung, prostate and skin). The data were for Africa, Australia & New Zealand, Canada & the USA, China, Europe, India, and Latin America & the Caribbean during the study period 2014 to 2018. These were compared (as percentages) with the corresponding disease burdens for 2015.

Results

Overall, cancer is relatively over-researched compared with its disease burden (14% of research, 9% of DALYs), but, paradoxically, under-researched in the USA, and particularly so in Europe and Australia. However, the geographical distribution of work on individual anatomical sites is much better, especially for liver, skin and prostate cancers. Its distribution among the six sites is well matched to the disease burden in Africa, China and India ($r2 = 0.87$, 0.66 and 0.60, respectively) but very poorly in the other continents.

Conclusion

We have shown that it is possible to check whether the cancer research portfolio at different scales (national, continental, world) matches the challenge in the form of the disease burden. This can help national and international funding agencies to tailor their support rather better to meet the medical needs of their client populations.

Key messages

- Cancer research should respond to the national disease burden but often does not
- It is over-researched globally, but under-researched in Australia, Europe and the USA

Burden of disease attributable to environmental risks in Finland

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Background

People are exposed to multiple environmental risks throughout their lives. For risk management it is important to estimate the health impacts at the population level. Environmental Burden of Disease (EBD) methods enable quantification of health risks in a comparable manner. This work aims to update the previous national burden of disease estimates.

Methods

The background burden of disease values were extracted from WHO Global Health Estimates for 2015. Exposure response functions and exposures were updated for air pollutants, indoor radon and environmental noise. Ten new air pollutants were added (NO_2, PM_c, benzene, TRS, SO2, CO, indoor $PM_{2.5}$, ambient PAH, As, Cd). We compared our estimates to the Global Burden of Disease (GBD) results.

Results

In total 72,000 disability adjusted life years (DALY) were lost due to the twelve selected biggest environmental risks. The attributable burden was the highest for ambient particles (30,000 DALY), environmental noise (8,700), and indoor radon (6,500). The other risks in the top twelve were indoor particles, secondhand smoking, UV radiation, nitrogen dioxide, other air pollutants, dampness at homes, methylmercury in fish, outdoor ozone and lead. The GBD study is less comprehensive for environmental risks, e.g. not including environmental noise, UV radiation or dampness at homes.

Conclusion

Methodological changes like dropping of discounting and age weighting, addition of new air pollutants and updating some of the exposures over doubled the previous estimates. The GBD assessment of environmental risks is less comprehensive and has substantial differences in the EBD estimates in comparison to the national assessment.

Key messages

- Environmental risks lead to over 72,000 healthy life years lost in Finland
- Large differences exist between national and GBD estimates for environmental risks

Food choices, health and costs : Effects of substituting red and processed m eat intake for plant based foods in the Portuguese population preliminary study of a dietary change

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Background

Dietary changes from current diets to healthy diets (i.e. plant-based diets) – with lower environmental impact – are likely to substantially benefit human health, averting about 10.8–11.6 million deaths per year.

Methods

This study will assess quantitatively the adverse and beneficial health effects of replacing the current Portuguese diet rich in red and processed meat with a diet richer in vegetables and legumes, based on the official Portuguese dietary guidelines and the recommendations of the National Food, Nutrition and Physical Activity Survey 2015-2016. Also, 10,1% of the Portuguese families had unsafe food issues, mainly due to lack of financial resources. Hence, the impact of diet changes on family economic sustainability will be accounted. That may be illustrated by using a Multi-Criteria Decision Analysis (MCDA) on a Risk Benefit Assessment (RBA), which could be applied to evaluate a wide range of risks and benefits in different contexts. The health effects of foods and food components will be assessed, by using RBA's approaches and epidemiological data.

Results

The health outcomes will be translated in DALYs. Whereas, in order to understand better the socioeconomic factors at play, complementary qualitative research methods will be used. The MCDA will also require the use of expert panels.

Conclusion

It is expected to provide a quantitative assessment of the impact of the adoption of dietary guidelines which may be used to inform decision makers and general population on the relevance of modifying food standards and better implementing, or re-evaluating, the Portuguese dietary guidelines and food policies.

Key messages

- Risk-Benefit Assessment approach with a Multi-Criteria Decision Analysis
- Health and Economic impact of a sustainable dietary change

The influence of ambient air pollution on health impacts

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Background

Despite ambient air quality improvement over the last decades there is continuing exceedances within Europe; Portugal is not exception. The main goal of FUTURAR project is to estimate the air pollution impact, health benefits and costs of emission reduction scenarios for 2030 in order to overtakes health related policy-oriented research gaps.

Methods

Modelling tools were used to estimate the spatial distribution of ambient air pollution and health impacts over Portugal. Reference exposure-response functions were used to estimate health impacts of emission reduction scenarios and to produce reference maps for health indicators. Health indicators include premature mortality and morbidity (bronchitis symptoms) associated to ozone (O_3), $PM_{2.5}$ (i.e., particulate matter with aerodynamic diameter smaller than 2.5 µm) and nitrogen dioxide (NO_2) exposure.

Results

Preliminary findings indicates that for 2030 scenario of optimal emissions (OPT2030), adjusted for weather conditions, only O_3 will remain in warning concentrations. Air quality improvement will be expected for urban centers, but NO_2 and $PM_{2.5}$ concentrations will remain exceeding the established ambient air quality directives. Regarding health impacts, premature mortality will be more associated to O_3. However, adjusting this model with climate changes (OPT2030_met), $PM_{2.5}$ will be the main pollutant contributing to this health endpoint. No differences on bronquite prevalence is expected in either scenario. Overall cost-benefit analysis indicates a health saving of around 224 M€ and 246 M€ for OPT2030 and OPT2030_met, respectively.

Conclusion

The FUTURAR preliminary results provide basis for the elaboration of health-based policies at national and regional level to improve ambient air quality and thereby reduce the associated burden of disease.

Key messages

- Estimates of air pollution health impacts are crucial for policy decisions
- Air quality improvements will reduce the health impacts and the burden of disease

Burden of diseases and injuries attributable to risk factors in European Union (EU-28) in 2017

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Background

Public health goals include monitoring health status, promoting health and preventing disease. Quantification of the disease burden by risk factors can help to inform health policy and identify opportunities for prevention. The Global Burden of Disease (GBD) study provides a comprehensive assessment of risk factor exposure and attributable burden of diseases and injuries. We aimed to analyze the European Union (EU) burden of disease and injuries, specifically using disability adjusted life years (DALYs), attributed to risk factors, in 2017.

Methods

Using the GBD 2017 study estimates, attributable DALYs and age-standardized DALY rates were analyzed for 84 behavioral, environmental and metabolic risk factors (different levels), for the whole EU and each country, in 2017.

Results

In 2017, all risk factors account for 44.4% of DALYs, with behavioral risk factors (level 1) contributing the most, followed by metabolic and environmental ones. Bulgaria, Romania and Hungary showed the highest proportion of DALYs attributable to risk factors, while France, the United Kingdom and Sweden were on the opposite end. The three leading risk factors (level 2) for EU age-standardized DALY rates were tobacco, dietary risks and high systolic blood pressure. However, risk factor patterns vary across EU countries.

Conclusion

Behavioral, environmental and metabolic risk factors can explain almost half of EU DALYs, revealing opportunities for prevention. While some risk factors had a more homogeneous distribution throughout the EU, others such as alcohol use varied greatly. In fact, these data can be used to plan and tailor EU and national prevention programs and policies.

Key messages

- Risk factors explain 44% of EU DALYs revealing opportunities for prevention
- Attributable DALYs for some risk factors (e.g. alcohol use) varied greatly in EU

Mapping the data sources for burden of disease study in Serbia

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Background

Global burden of disease study covers more than 300 different causes of death and disability. The information on this diverse group of illnesses and risk factors often come from different sources. We mapped the relevant data sources on risk factors, morbidity and mortality in Serbia for conducting a burden of diseases study (BoDS).

Methods

For mapping exercise, the available data sources were assessed following the criteria: 1. condition; 2. whether International Classification of Disease 10 revision (ICD-10) codes are used; 3. population 4. territory, 5. period 6. Indicators; 7. Completeness; 8. Socio-demographic characteristics; and 9. frequency of reporting.

Results

Periodical population-based surveys are important source on risk factors prevalence such as tobacco and alcohol use, physical activity, diet, etc. Disease registers (for some communicable and non-communicable diseases e.g. the acute coronary syndrome, malignant diseases and diabetes mellitus) use ICD-10 codes and provide data on incidence at the national and regional level on yearly basis. Source of these data as well as data on environmental risk factors is the Institute of Public Health of Serbia. The National Health Insurance Fund collects health expenditure data related to cases of diseases/conditions (coded by ICD-10) treated in public healthcare institutions. The Statistical Office of the Republic of Serbia (SORS) provides mortality data using ICD-10 codes.

Conclusion

Numerous data sources on risk factors, morbidity and mortality in the country can be used for undertaking an epidemiological analysis in Serbia. However, methodological and other limitations of data should be taken into account while conducting national/local BoDS.

Key messages

- Estimating and interpreting BoD must describe data limitations and potential biases
- Conducting BoDS might require additional analyses and generating assumption

The burden of premature mortality: How does it affect to working ages in USA an Europe?

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Background

Premature mortality (15-64 years old) due to coronary heart diseases, drugs, accidents, violence, alcohol use disorders, or lung cancer is one of the main causes of productivity losses in the world. Besides, it is a dramatic male phenomenon, especially in young and middle-age groups. European Union (EU) and the United States (USA) have shown different mortality and morbidity trends in the epidemiological transition, especially in premature mortality due to risky behaviors and external causes, mainly in the violent ones. In this scenario, the objective of this work is to analyze the burden of premature mortality at working ages of the US and European population by gender and cause of death.

Methods

Data came from World Health Organization. Year baseline was 2015, although some data was not available for that year, so we chose the closest one. We calculated Standard Expected Years of Life Lost (SEYLL) and SEYLL rates for the EU and the US populations as indicators of burden of premature mortality, following the classic Murray and López's Global Burden of Disease Study.

Results

In both the EU and the US, neoplasms, cardiovascular diseases and external causes sum up 72% of SEYLL. However, their weights change considerably in each territory. In the EU, neoplasms are 33% (27% males, 46% females), external 22% (27%; 14%) and cardiovascular 16% (18%; 13%), while in the US the figures are 17% (14% males, 24% females), 37% (43%; 26%) and 17% (18%; 16%), respectively. We found strong gender differences intra and inter territories, and among causes of death, mainly in external causes. By specific cause of death, suicide, ischaemic heart diseases and lung cancer rank first in the EU; in the US, suicide, transport accidents, and ischaemic heart diseases. Also gender differences are found.

Conclusion

Burden of premature mortality is considerably higher in the US than in the EU. Furthermore, the main contributors are also different: in the EU, neoplasms and cardiovascular diseases stand out, while in the US external causes rank clearly first.

Key messages

- The EU and the US show significant differences in burden of premature mortality
- EU: suicide, transport accidents and alcohol abuse should be main targets at public policies; US: drug abuse and deaths by assault

Tobacco consumption and gender gap in burden of mortality and life expectancy in Spain

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Background

Smoking is an important public health problem, and one of the main avoidable causes of morbidity and mortality. In Spain, tobacco consumption prevalence has changed its patterns in the last thirty years: men over 50 years old have started quitting, and women at all ages have increased consumption. The aims of this paper are 1) to explain the impact of tobacco consumption in mortality, life expectancy, and gender gap in life expectancy, and 2) to estimate years of life lost due to tobacco in Spain.

Methods

Data on causes of death in Spain, from Spanish National Statistics Institute (INE), and Human Causes-of-Death Database; Spanish period life tables, from Human Mortality Database; and tobacco consumption, from Spanish Health Surveys. Three methods: 1) Poisson regression, for the mortality trends; 2) decomposition of differences in life expectancy by ages and by causes of death; 3) Standard Expected Years of Life Lost (SEYLL) and SEYLL rates.

Results

There are two phases of impact of tobacco epidemic in Spain. Until mid-90s, contributions of mortality to life expectancy were very negative to men 50-90 years old, and almost neutral to women. Since mid-90s the pattern changes: contributions are positive for men at all ages, and negative for women 50-85 years old. Therefore, tobacco consumption is narrowing the gender gap in life expectancy at birth. There are about 52,000 deaths tobacco-attributable per year (90% men). The average of smoking-related SEYLL in 1980 was 8.9 (males) and 6.3 (males), while in 2012 was 7.6 and 5.2.

Conclusion

Although decreasing, tobacco in Spain is still an epidemic, and it is increasing for women. One out of three SEYLL are smoking-related. Women born in a more gender equal context have smoking prevalence patterns to men.

Key messages

- Smoking prevalence and lung cancer mortality of women (past & current) should worry
- Gender- and vulnerable populations- sensitive public policies are needed

Eliciting main drivers of change of disease burden expressed in DALYs – the case of diabetes mellitus in Poland, 2000–2017

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Background

For evidence-informed health policy development there is a need of identification what are the real factors of disease burden escalation.

Methods

We used Global Burden of Disease 2017 data to explore disability-adjusted life years (DALYs) due to diabetes mellitus in Poland, 2000-2017 period. To help understand drivers of change of DALYs number due to diabetes over the studied period we estimated percent changes due to three factors: (i) population size, (ii) population ageing, and (iii) change in the underlying age-adjusted DALYs rates. The paper presents the method developed, main steps and data used to elicit the impact of each factor listed above.

Results

From 2000 to 2017 diabetes prevalence in Poland rose by 41.9%, the crude diabetes death rate – by 45.3% and total number of DALYs due to diabetes increased by 34.5%. This diabetes burden change can be decomposed to: change due to Poland's population size variation (DALYs number reduction by 1.3%) and population ageing (DALYs number increase by 25.17%). Concurrently the rise in the underlying, age-adjusted rate of DALYs due to diabetes mellitus led to a 10.63% (34.5% - (-1.3%) - 25.17%) rise in DALYs number due to diabetes.

Conclusion

The main driver of diabetes burden growth in Poland is population ageing, however additional considerable reasons exist, which should be addressed. About 11% of DALYs number growth was due to modifiable diabetes risk factors and poor health system performance. Findings call for implementing effective interventions adapted for Poland's ageing population, aiming to improve population awareness and behaviour change by adopting healthier lifestyles.

Key messages

- Impact of change in underlying age-adjusted DALYs rates due to diabetes is elicited
- Method developed can be used to examine drivers of change in any disease burden

Antibiotic resistance related to Water, Sanitation and Hygiene: Global exposure and burden of disease to ESBL – top-down and bottom-up approaches

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Background

As for diarrheal pathogens, transmission of antibiotic resistant bacteria is likely related to water. We investigated burden of disease (BoD) from exposure to specific antibiotic resistant bacteria by inadequate water, sanitation and hygiene (WaSH) worldwide. Aims were, first, summarizing existing knowledge on BoD of ESBL-producing *E. coli*, and on methods to attribute cases of diarrhea to inadequate WaSH, and identifing data gaps inhibiting combining approaches. Second, determining exposure to ESBL-producing *E. coli* related to selected transmission routes affected by inadequate WaSH.

Methods

1) Literature review

2) Exposure to ESBL-producing *E. coli* through WaSH was modeled for several practical examples, including drinking water (based on MICS country data) and contact with city drains and floods (based on surface water quality data). Dose-response modelling for intestinal colonization then led to estimates of ESBL prevalence. All estimates were realized in a Bayesian Monte Carlo model.

Results

Drinking water could represent a relevant exposure route, with up to 100 CFU of ESBL/day in highly contaminated countries, resulting in modelled prevalences of 0, 16 and 86% ESBL population prevalence (for countries with low, medium and high contamination). Other exposures are likely higher, but affect fewer people.

Conclusion

Data gaps prevent application of top-down approaches, like BoD for resistant hospital infections and for WaSH-attributable diarrhea. Data on the effect of WaSH interventions on carriage/infections are especially needed. Bottom-up approaches focusing on exposure are likewise hampered by data gaps, like ESBL surface water concentrations and their relation to sanitation. Data gaps can be filled to some extent with model assumptions.

Key messages

- Data gaps should be filled to calculate the WaSH-attributable BoD of AMR
- Drinking water is a possible exposure route for many countries

Environmental infectious disease burden – what do we know?

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Background

The National Institute for Public Health and the Environment in the Netherlands publishes an annual report on the State of Infectious Diseases, aimed to inform policy makers on the national and regional level. It bundles the disease burden and most relevant signals and developments regarding infectious diseases. These include diseases that transmit via various different routes, such as foodborne, sexually transmitted diseases, and respiratory infections. We want to start a discussion on the contribution of environmental routes to the burden of infectious disease.

Methods

The amount of available data for different infectious diseases underlying such reports is highly variable. Usually, for notifiable diseases, such as Legionnaires disease and leptospirosis, more data are available than for non-notifiable diseases. Notifiable diseases are often severe diseases. Due to underreporting and under-ascertainment, especially milder diseases or mild outcomes of severe disease can be overlooked, while the affected population can be large. It may be that this is especially the case for environmentally transmitted infectious diseases (diseases transmitted via, for example, ambient air, or recreation in surface water), as exposure routes are less obvious and traceable than in, for example, hospital- or food-acquired infections.

Conclusion

It is possible that the burden of environmentally transmitted infectious diseases is higher than appears from overview reports such as the State of Infectious Diseases or WHO work. Comprehensive insight into the environmental burden of infectious disease is lacking. Therefore, we would like to discuss initiatives on this topic with the scientific community.

Key messages

- Comprehensive insight into the environmental BoD of infectious disease is lacking

Spatio-temporal trends of particulate matter and ozone: From exposure assessment to burden of disease

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Background

Epidemiological research for assessment of the impacts of ambient air pollution on populations health requires estimates of exposures that are used to relate pollutant exposure levels to disease incidence which can in turn be used to calculate health costs in disability adjusted life years lost.

This work shows first steps taken to evaluate the impacts of air pollutants in myocardial infarctions (MI) cases in Portuguese population during the 2018-2022 period, combining geostatistical models for exposure assessment, AirQ+ software tool to estimate excess number of MI cases and calculating costs in terms of disability adjusted life year to evaluate burden of disease.

Methods

Geostatistical models will be used to predict ozone, coarse and fine particulate matter with high spatio-temporal resolution. Predictions representative of population exposures will be loaded into AirQ+ tool to calculate the attributable proportion of MI cases caused by air pollutants above World Health Organization (WHO) cut-off limits, Years of Life Lost (YLL) and Years Lost due Disability (YLD).

Results

The methodology proposed for exposure assessment will take advantage of broad spatial coverage, with both short and long-term exposures. This is particularly relevant in regions with few or no air monitoring stations and in high densely populated urban areas where pollutant concentrations tend to vary at small distances and should provide a substantial improvement in exposure estimation over the traditional approach (nearest monitor).

Conclusion

Combined with techniques that estimate attributable proportion of MI cases due to air pollutants and calculate YLL or YLD, geostatistical models are suitable tools to provide assessment of burden of MI.

Key messages

- Geostatistics can provide adequate framework for ambient air pollution exposure assessment
- Can be incorporated in assessment of burden of disease caused by air pollution exposure

The Burden of disease in the population of Croatia

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Background

Disability-adjusted life years (DALYs) calculates years of life lost due to premature deaths and years disabled due to disease within a population. In Croatia, according to WHO estimates, about 50% of DALYs is caused by three main risk factors: improper diet, elevated blood pressure, and smoking, which are then followed by increased body mass index, harmful alcohol consumption, and inadequate physical activity.

Methods

Compare DALYs in Croatia with the European Union countries.

Results

Cerebrovascular diseases are the leading cause of the disease burden in Croatia, according to WHO estimates, accounting for 26% of all DALYs. The second place is taken by malignant diseases with 20.4%, followed by mental disorders (11.7%), non-intentional injuries (7.3%), and disease of the skeletomuscular system (6.7%). Globally, non-communicable diseases (NCDs) and injuries are generally on the rise, while communicable, maternal, neonatal, and nutritional causes of DALYs are generally on the decline in Croatia.

Conclusion

It is known that chronic NCDs are largely preventable, that they share risk factors and determinant causes, and that effective, economical, and evidence-based interventions exist that can prevent and manage chronic NCDs in order to avoid early mortality and invalidity, reduce the disease burden, and improve quality of life. Based on the above, NCDs are a priority in the Croatian public health system. Important progress can be achieved if the necessary measures are introduced at the national level in three basic areas: monitoring and management, prevention, and treatment.

Key messages

- Non-communicable diseases and injuries are generally on the rise
- Introducing necessary measures at the national level in three basic areas: monitoring and management, prevention, and treatment

Evaluation of primary care service of Cyprus's newly established national health system: The route to implementing burden of disease studies

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Background

There is an increasing interest in the evaluation of Primary Care service performance and its impact on service delivery and patient care quality. We aim to perform an evaluation study for the newly adopted National Health System (NHS) in Cyprus to address current gaps and establish how best to match resources to meet the population needs.

Methods

We aim to assess the service performance using process outcomes. We will use structured questionnaires, interviews and focus groups using anonymized data from various NHS affiliated service providers. These will capture patient satisfaction on quality of care, clinical effectiveness, equality and accessing the services during its first year of operation. The process outcomes will be measured against various quality indicators such as vaccination coverage, smoking cessation offering and physical activity monitoring. Basic descriptive statistics will be generated for the quality indicators. We will use correlation analyses to describe the various relationships associated with service performance.

Results

The results will provide a pilot evaluation of and a first snapshot of the new Cypriot NHS. The potential of the findings is to then map these to the management of patients' condition and how best they can be used to address the burden of disease of the Cypriot population.

Conclusion

Such an action is clearly an urgent need in Cyprus, where the largest service reconfiguration took place in the European Union history, as the last Member State adopting a universal National Health System in June 2019.

Key messages

- This will be the first attempt to evaluate service performance of Cyprus's NHS
- Service evaluation is vital for the continuous improvement of the NHS

Dietary exposure to aflatoxins in the Portuguese population – the use of biomonitoring data to assess the associated burden

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Background

Human biomonitoring (HBM) is an important tool to assess the human exposure to chemicals, contributing to describe trends of exposure over time and to identify population groups that could be under risk. Aflatoxins (AFTs) are genotoxic and carcinogenic compounds causing hepatocellular carcinoma (HCC), the third leading cause of cancer deaths worldwide. In Portugal, scarce data are available regarding exposure to AFTs and none previous study used HBM data to characterize comprehensively the associated burden.

Methods

24h-urine samples (n=94) were analyzed by liquid chromatography–mass spectrometry (LC-MS/MS) for the determination of AFTs (B_1, B_2, G_1, G_2, M_1). Regarding left-censored data (< LOD) a substitution approach was considered (< LOD = 0). Deterministic and probabilistic models were developed to estimate the health impact of the exposure to aflatoxins, estimating the DALYs attributed to AFTs exposure for the Portuguese population (10291k).

Results

AFTs were detected in 13% (AFB_1), 16% (AFB_2), 1% (AFG_1), 2% (AFG_2) and 19% (AFM_1) of the 24h-urine samples. The mean probable daily intake estimated was 16.7 and 13.4 ng/kg body weight/day, calculated mean DALYs/100k were 1.7 (0-10.7) and 1.68 (0.04-6.23) considering the deterministic and probabilistic models, respectively.

Conclusion

The present study generated, for the first time and within a HBM study, reliable and crucial data to characterize the burden associated to Portuguese population exposure to aflatoxins. The obtained results constitute an important contribution to support risk managers in the establishment of preventive policy measures that contribute to ensure the public health protection.

Key messages

- Portuguese population is exposed to aflatoxins, carcinogenic toxins to humans
- Human biomonitoring studies contribute to an accurate estimation of the burden

Use of routine data for epidemiology in Austria

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Background

The Austrian Social Insurance (DV) is responsible for health, pension and occupational accident insurance and covers 99% of the population of Austria. Health service related data is collected routinely, and is used for country-wide, regional, and comparative analysis. This administrative data are available for the primary and specialist care sector and on the hospital level. There is a lack of diagnostic coding for the outpatient sector, whereas for the hospital sector, a DRG -related coding system (the so-called LKF-system) exists for hospital reimbursement.

Methods

With routine hospital and medicines data, incidence rates of specific diseases can be calculated. A registry containing causes of mortality and a national registry for cancer can also be utilized. In terms of identifying disability, the centralized nature of data allows for such calculations using pension (including employment), sick leave, and social care allowance data. DV has several projects on pharmacoepidemiological analysis but currently lacks initiatives calculating DALYs.

Results

For health care planning it is important to quantify burden of disease. With the available data sources, we can develop methods to glean information on prevalence (e.g. the Austrian epidemiology atlas) and make estimations for incidence rates of specific diseases.

Conclusion

DV does not currently have experience quantifying the burden of disease through DALYs. By drawing on the expertise of the Cost Action members, we would like to find methods and opportunities to use Austrian routine epidemiological data to calculate DALYs.

Key messages

- Developing methods would allow for conclusions on burden of disease
- Methods of analyzing routine data should be improved to calculate DALYs

Burden of occupational disease estimates can support policies to prevent chemical exposure in the workplaces

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Background

Estimation of the burden of disease from different risk factors is a useful public health tool in assessing premature deaths and illness. Indeed, this information will also provide decision makers with data to facilitate prioritisation of risk reduction strategies. However, limited studies have been dedicated to occupational risks and the burden due to occupational diseases.

Methods

A short review was performed to understand the main limitations for estimating burden of occupational disease and describe the main utilities of this information on the ongoing regulatory work developed in the scope of chemical safety.

Results

The major limitations to develop more studies are related with the lack of chemical exposure data and inadequate information related with the number of workers employed in specific workplaces were exposure to a particular chemical can happen. Other relevant limitation is the fact that data about occupation/workplace exposure in not commonly register by physicians, hospitals and cancer registrations. All this information should be available to proper link exposure to disease and to use burden of disease to justify a regulatory action for a specific chemical substance.

Conclusion

A joint action should be developed in Europe to guarantee that all the information about exposure and occupational diseases is available and accurate to allow the estimation of the burden of occupational diseases linked with chemical exposures. Burden estimation studies can support policies aiming to reduce occupational diseases due to exposure to chemical substances in the workplaces.

Key messages

- Burden estimation is an also important tool for occupational health interventions
- Burden estimation can support policies aiming to prevent occupational diseases

Unexpected changes in leading causes of death and risk factors in Bosnia and Herzegovina in the last decade

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Background

Non-communicable diseases (NCDs) account for 94% of all deaths in Bosnia and Herzegovina (BiH). Risk factors responsible for the most disease burden in BiH are dietary risks, high blood pressure and tobacco smoking. The aim of this research was to identify the 10-year change in the total number of life lost years (YLLs) due to different NCDs and disability-adjusted life years (DALYs) in risk factors that drive the most death and disability in the BiH population.

Methods

While the YLL represents the number of deaths multiplied by the standard life expectancy at the age at which death occurs, the YLD refers to the particular cause in a particular time period, where the number of incident cases is multiplied by the average duration of the disease and a weight factor. DALY is the sum of the YLL due to premature mortality and the YLD.

Results

In BiH, The Global Burden of Diseases study from 2007 to 2017 showed the positive trend of change in YLLs due to ischemic heart disease (9.5%), stroke (7.5%), diabetes (22.3%) and Alzheimer's disease (36.9%) meaning that people with these diseases live longer. Among the risk factors that drive the most death between 2007 and 2017, a positive trend of change in DALYs was observed in smoking (4.4%) and high level of glucose in the blood (4.6%) while a negative was associated with work conditions (-14.1%), alcohol usage (-11.1%) and polluted air (-10.4%).

Conclusion

The progress in terms of improving the quality of life among those with NCDs has been achieved.

Key messages

- Progress in terms of decreasing YLLs due to non-communicable diseases has been achieved
- Future preventive work with a focus on risk factors still remains basic

The past, present and future burden of non-communicable diseases in Ireland

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Background

Non-Communicable Diseases (NCDs) are biggest killers. However, there is no comprehensive NCD burden study nationwide to inform policy-makers. We set out to undertake this focusing on the past, present and future burden of NCDs in Ireland.

Methods

The GBD methodology was employed to abstract data from GBD Compare website – both for common NCDs and associated risk factors across three data points: 1990, 2017 and 2040. Summary metrics: age-standardized death rates; DALYs; and Life Expectancy (LE) were estimated. The GBD Foresight tool was utilized for future projections.

Results

CVD and cancer deaths were two biggest killers between 1990 and 2017; neurological disorders will be the 3rd biggest killer in 2040. In terms of DALYs, smoking ranks first between 1990 and 2017, but high BP will overtake in 2040. Risk-attributable NCD burden shows a different pattern. Cancer deaths and DALYs attributable to both high-BMI and alcohol increased, while tobacco-attributable NCD deaths decreased. Overall death patterns in dietary risks were positive, except for high SSB-related deaths. For disease-specific burden, Alzheimer's disease will be 2nd biggest killer in 2040. It is also projected that stroke deaths will fall significantly from ranking fourth in 2017 to eleventh in 2040. Unlike males, females had an average of 5-year increased LE between 1990 and 2017. On assuming a standard progress in health scenarios, the overall LE will increase by 2.07 years between 2017 and 2040.

Conclusion

A standardized burden of disease methodology (the GBD methodology) allows for comparisons and benchmarking the health performance of a specific population to inform policy-makers towards precision public health.

Key messages

- NCDs still contribute substantially to the burden of disease in Ireland
- Life expectancy is projected to increase at a slower pace between 2017 and 2040

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