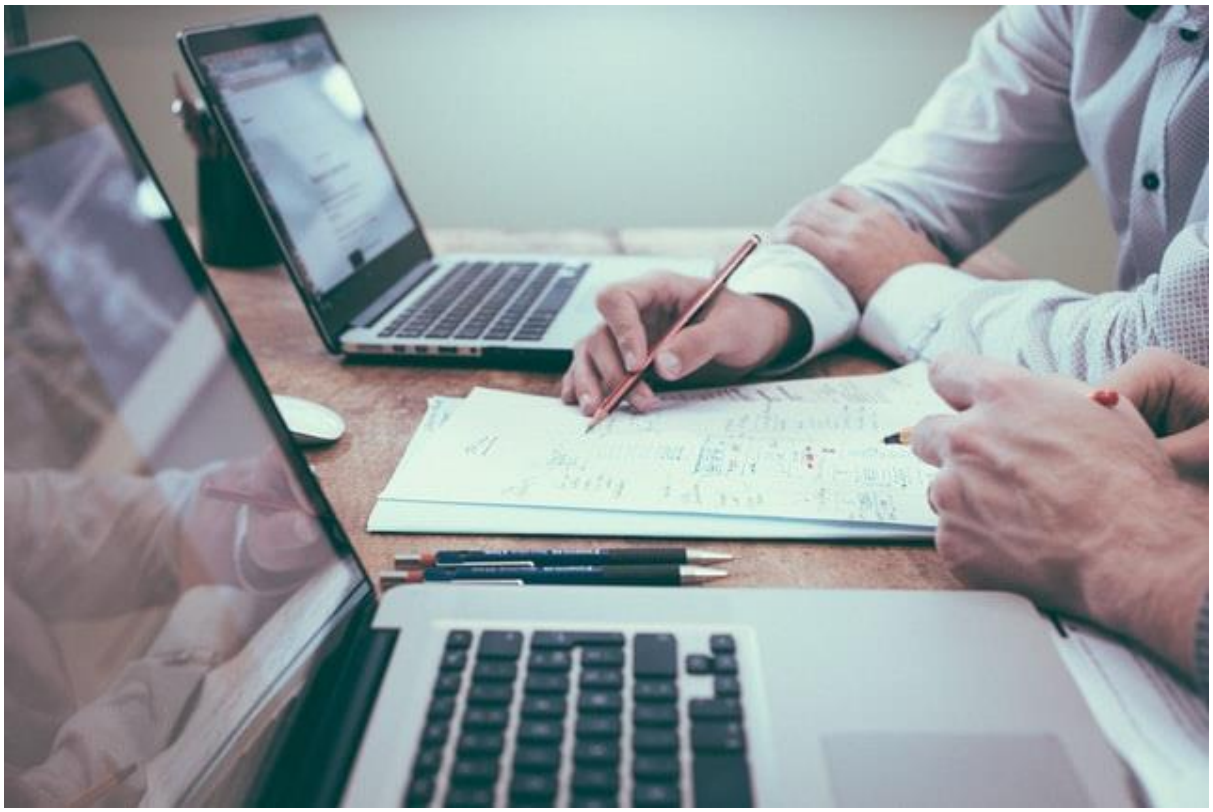
COST Action CA18218
European Burden of Disease Network

1st Training School

General concepts of burden of disease

Online training

28 May, 4 June, 11 June, 2021



www.burden-eu.net/training

About the European Burden of Disease Network

The European Burden of Disease Network (COST Action CA18218; www.burden-eu.net) aims to act as a technical platform for integrating and strengthening capacity in burden of disease assessment across Europe and beyond. The network currently comprises almost 300 members, and has actively supported capacity building and knowledge transfer since 2019. COST (European Cooperation in Science and Technology; www.cost.eu) is supported by the European Union (EU) Horizon 2020 Programme.

About COST Training Schools

COST Training Schools (TS) provide intensive training in basic and emerging research topics within the organisations involved in the Action. Participants are mainly, but not exclusively, young researchers involved in the Action. TS have a duration of three days to two weeks.

1st European Burden of Disease Network Training School

Objectives

The 1st burden-eu TS focuses on the **general concepts of Burden of Disease** and serves as an introduction into the field. It provides public health professionals, and researchers from related fields, with theoretical and practical knowledge about summary measures of population health, the historical background of the Global Burden of Disease study and its outputs. Furthermore, the TS introduces the concept and rationale of the main metrics (YLLs, YLDs and DALYs), and underlines their application and importance or priority setting in public health policy and decision-making processes.

The TS will be offered on a regular basis, allowing for multiple people to get introduced to the basic concepts of burden of disease.

Structure

The TS will be held **online** and organized in **three modules**, taking place once a week, on 28 May, 4 June, and 11 June, 2021. Each module will include theoretical sessions and practical exercises with follow-up discussions. Each module is planned to take place from 10h00 to 15h00 CET, including a lunch break. The first module will start earlier, at 9h30 CET, to allow for introductions of trainers and trainees.

- **Module 1 (Introduction to DALYs and YLLs)** introduces summary measures of population health and the basic concept of burden of disease, DALYs and YLLs
- **Module 2 (Introduction to YLDs)** focuses on disability weights and the other main YLD inputs: input data, severity distributions, and comorbidity adjustment
- **Module 3 (DALYs: from theory to practice)** addresses practical issues related to data, assumptions, and uncertainties, and puts a focus on knowledge translation

Program

Time (CET)	Module 1 28/05/2021	Module 2 04/06/2021	Module 3 11/06/2021
9:30	Welcome Tour de table		
10:00	**Introduction to DALYs: historical and technical basis**	**Disability weights: theory and applications**	**From theory to practice: data, assumptions, uncertainties**
11:00	Exercise	Exercise	Exercise
12:00	Discussion	Discussion	Discussion
12:15	Lunch break	Lunch break	Lunch break
13:00	**Calculating Years of Life Lost**	**Calculating Years Lived with Disability**	**Knowledge translation**
14:00	Exercise	Exercise	Exercise
14:45	Q&A	Q&A	Q&A
15:00	Closure	Closure	Closure

Eligibility and registration

The TS is open to all burden-eu members. The number of participants will be limited to a maximum of 25. If the number of applications would exceed the maximum number of available seats, candidates will be selected a) to prioritise motivated students and early career investigators and b) to ensure gender and geographical balance (and favouring representatives from Inclusiveness Target Countries).

A stable internet connection will be needed, and a working version of MS Excel for the exercises. Teaching will be in English.

Registrations for the TS are now closed.

Module Program

Module 1: Introduction to DALYs and YLLs

Trainers

- Brecht Devleesschauwer
- Elena von der Lippe
- Dietrich Plaß

Learning objectives

- Get a good understanding of what burden of disease is
- Learn about the historical development and the current outputs of the Global Burden of Disease Study
- Learn about the basic concept of Disability-Adjusted Life Years
- Get a good understanding of the estimation of Years of Life Lost, including data quality and adjustments, choices of life tables and the consequence for the estimates

Contents

This module consists of two sessions. The first session introduces the burden of disease concept and gives an overview of summary measures of population health, and Disability-Adjusted Life Years (DALYs) in particular. It gives a historical overview of the Global Burden of Disease (GBD) and provides insights in to the GBD visualization tools. A group exercise is included which will help to better use, understand and interpret of the GBD estimates.

The second session concentrates on the estimation of Years of Life Lost (YLL). It gives an overview of data sources and data quality and discusses several steps and methodological choices that have to be made in order to calculate YLL. The session includes a group exercise which will provide practical understanding of the estimates and their interpretation.

Reading materials

Murray, C.J. Quantifying the burden of disease: the technical basis for disability-adjusted life years. *Bull World Health Organ* **72**(3), 429-445 (1994). https://www.ncbi.nlm.nih.gov/pmc/articles/pmc2486718/

Devleesschauwer, B., Havelaar, A.H., Maertens de Noordhout, C., *et al.* Calculating disability-adjusted life years to quantify burden of disease. *Int J Public Health* **59**, 565-569 (2014). https://doi.org/10.1007/s00038-014-0552-z

GBD 2019 Viewpoint Collaborators. Five insights from the Global Burden of Disease Study 2019. *Lancet* **396**(10258), 1135-1159 (2020). https://doi.org/10.1016/S0140-6736(20)31404-5

Module 2: Introduction to YLDs

Trainers

- Juanita Haagsma
- Ian Grant
- Grant Wyper

Learning objectives

- Get a good understanding of the methods used to derive disability weights
- Learn which sets of disability weights are available
- Understand the need to have severity distributions to map epidemiological data to disability weights
- Understand how to create severity distributions using literature and survey data

Contents

The first part of this module aims to teach methods to derive disability weights and to get hands on experience with health state valuations underlying disability weights. Students are taught methods that are used to derive disability weights and to apply and interpret disability weights to calculate YLDs.

The second part of this module aims to teach methods to assess the distribution of severity in the occurrence of disease and get hands experience in applying severity distributions to calculate YLD. Students are taught to the methods that are used to estimate severity distributions using epidemiological data and apply severity distributions to calculate YLDs.

Reading materials

Salomon, J.A., Haagsma, J.A., Davis, A., *et al.* Disability weights for the Global Burden of Disease 2013 study. *Lancet Glob Health* **3**(11), e712-e723 (2015). https://doi.org/10.1016/S2214-109X(15)00069-8

Essink-Bot, M.L., Bonsel, G.J. How to derive disability weights? In Summary Measures of Population Health: Concepts, Ethics, Measurement and Applications. Edited by Murray, C.J.L., Lopez, A.D., Salomon, J.A. Geneva: World Health Organization, 2002. https://www.researchgate.net/publication/254747629_How_to_derive_disability_weights_Chapter_91

Wyper, G.M.A., Grant, I., Fletcher, E., *et al.* Prioritising the development of severity distributions in burden of disease studies for countries in the European region. *Arch Public Health* **78**, 3 (2020). https://doi.org/10.1186/s13690-019-0385-6

Module 3: From theory to practice

Trainers

- Brecht Devleesschauwer
- Henk Hilderink
- Elena Pallari

Learning objectives

- Understand the key steps of a real-life DALY calculation
- Learn about the key sources of uncertainty and heterogeneity when calculating DALYs
- Understand the basic definitions and models of knowledge translation (KT)
- Learn about the use of KT frameworks through examples of burden of disease studies in big, medium and small European countries
- Apply KT models and frameworks to burden of disease projects

Contents

This module aims to put theory into practice, and aims to answer two key questions – how can we implement a burden of disease calculation in real life, and how can we use burden of disease estimates to inform decision makers?

The first session of this module will discuss the practical aspects of a burden of disease study. It will introduce a stepwise approach for calculating DALYs and will give a structured overview of the key choices and assumptions relevant to DALY calculations. It will also highlight common issues related to data and uncertainties. The session will include an exercise that will ask participants to make a critical assessment of published burden of disease studies, allowing to create a better understanding of prevailing methodological heterogeneity, and the need for consistent and transparent reporting of methods and results.

The second session of this module will focus on Knowledge Translation (KT). During the first part of this session, participants will learn about the basic definitions and models of KT. The didactic part aims to introduce to participants a general overview of existing tools, methodologies and models. Practical examples will be shown from countries on how KT tools can be used for burden of disease studies such as stakeholder mapping, communication strategies, the application of the push model and the sustainability of projects on the translation of updated evidence. The second part of the session is a practical session where participants will be split into four groups, each working on a separate aspect on the KT roadmap. The aim of this interactive part is for participants to apply in practice their learning.

Reading material

Devleesschauwer, B., Havelaar, A.H., Maertens de Noordhout, C., *et al.* DALY calculation in practice: a stepwise approach. *Int J Public Health* **59,** 571–574 (2014). https://doi.org/10.1007/s00038-014-0553-y

von der Lippe, E., Devleesschauwer, B., Gourley, M., *et al.* Reflections on key methodological decisions in national burden of disease assessments. *Arch Public Health* **78**, 137 (2020). https://doi.org/10.1186/s13690-020-00519-7

Green, L.W., Glasgow, R.E. Evaluating the relevance, generalization, and applicability of research: issues in external validation and translation methodology. *Eval Health Prof* **29**, 126-153 (2006). https://doi.org/10.1177/0163278705284445

Kitson, A., Powell, K., Hoon, E., *et al.* Knowledge translation within a population health study: how do you do it? *Implement Sci* **8**, 54 (2013). https://doi.org/10.1186/1748-5908-8-54

Nilsen, P. Making sense of implementation theories, models and frameworks. *Implement Sci* **10**, 53 (2015). https://doi.org/10.1186/s13012-015-0242-0

Trainers

Brecht Devleesschauwer, Sciensano, Belgium

Dr. Brecht Devleesschauwer is a senior epidemiologist at Sciensano (the Belgian institute for health) and visiting professor in Risk Analysis at Ghent University. He conducts policy-driven public health research in the domain of composite measures of population health and health inequalities. As a member of the World Health Organization Foodborne Disease Burden Epidemiology Reference Group (WHO/FERG), he contributed to the estimation of the global burden of foodborne disease. Currently, he is coordinating the Belgian National Burden of Disease Study, and chairing the European Burden of Disease Network (COST Action CA18218). Brecht holds PhD degrees in Public Health and Veterinary Sciences, and MSc degrees in Biostatistics and Veterinary Medicine.

Ian Grant, Public Health Scotland, UK

Dr. Ian Grant is a Principal Researcher at Public Health Scotland in Edinburgh, United Kingdom. He studied Politics and History, and obtained his PhD in Epidemiology. He has been working for the National Health Service in Scotland, since 1997, across public health, and statistics, institutes. In 2012, Ian was one of the core group that initiated the Scottish Burden of Disease study, and is the co-leader of the Methods Working Group of the COST Action European Burden of Disease Network. Recently his focus has been on defining and developing burden of disesese methodologies in national burden of disease assessments.

Juanita Haagsma, Erasmus MC, the Netherlands

Dr. Juanita Haagsma, PhD in health sciences, works as Assistant Professor at the Department of Public Health at the Erasmus MC, University Medical Center Rotterdam, The Netherlands. Her research focuses mainly on burden of disease estimates of injury and quantifying long-term consequences of injury in particular. For several years, she worked as Assistant Professor at the Institute for Health Metrics and Evaluation (IHME) at the University of Washington, where she was a member of the injuries team of the Global Burden of Disease study. She was responsible for the development and implementation of methods to calculate the global burden of injury. In addition, she has conducted several studies on disability weights, including a large disability weight study that collected responses from more than 30,000 people from four European countries.

Henk Hilderink, National Institute for Public Health and the Environment, the Netherlands

Dr. H.B.M. (Henk) Hilderink is Senior Scientific Advisor Population Health Foresight at the Dutch National Institute for Public Health and the Environment (RIVM National Institute for Public Health and the Environment). He studied Mathematics and obtained his PhD in Demography. He has been working at RIVM National Institute for Public Health and the Environment since 2014 and was project leader of two Public Health Status and Foresight Studies which included Burden of Disease (BoD) estimates and projections for the Netherlands. Before that, he worked on various national, European and global projects, such as the Sustainability Outlook, OECD Environmental Outlook and the UNEP Global Environmental Outlook, where he contributed with the modelling of demography and population health.

Sara Monteiro Pires, National Food Institute, Denmark

Dr. Sara Pires is a senior scientist at the National Food Institute, Technical University of Denmark. Her main areas of research are the burden and control of foodborne diseases. She has developed and applied methods to assess the burden of food-associated diseases at national and international level, and to provide evidence to guide public health policy for disease prevention. She is the chair of the Working Group on Infectious Diseases of the European Burden of Disease Network.

Elena Pallari, Health Services Research Center, Cyprus

Dr. Elena Pallari is affiliated with the Health Services Research Center in Cyprus. She is a Researcher at the Medical Research Council Institute for Clinical Trials and Methodology at University College London and Teaching Fellow on the MSc Psychology & Neuroscience of Mental Health/Applied Neuroscience Programme at King's College London. She also serves as a Scientific Consultant for different research groups and clients in the United Kingdom and Europe. Elena has studies in Biochemical Engineering, Pharmaceutical Medicine, Quality Management and Business. A recent example of her work is on identifying indicators to measure the impact of the disease caused from the novel coronavirus (Covid-19) on the public health system of Cyprus. She has experience in evidence-based curriculum development, psychometric tools set-up, quantitative and qualitative research methodologies and data analysis, systematic literature reviews, and research impact evaluation.

Dietric Plass, German Environmental Agency, Germany

Dr. Dietrich Plaß holds a PhD and MSc in Public Health and a BSc in Health Communication. He is currently working as a senior researcher and is deputy head of the department "Exposure Assessment and Environmental Health Indicators" at the German Environment Agency. There he is responsible for national assessments of population health effects due to different environmental exposures with major focus on ambient air pollution. He is an expert in the field of burden of disease and environmental burden of disease assessments as well as in the field of environmental epidemiology. Prior to joining the German Environment Agency he worked as a senior researcher and lecturer at Bielefeld University in the working group "Public Health Medicine" with focus on infectious disease epidemiology, population health and burden of disease. Dr. Plaß is collaborator in the Global Burden of Disease Study, member of the WHO European Region "European Burden of Disease Network" and chair of the working group "risk factors" in the EU-COST-Action "European Burden of Disease Network".

Elena von der Lippe, Robert Koch Institute, Germany

Dr. Elena von der Lippe is a scientific researcher at the Robert Koch Institute (RKI) in Berlin, Germany. She studied statistics and obtained her PhD in Demography. She has been working in RKI since 2008 in the Department of Epidemiology and Health Monitoring. She has worked on the conception, organization, quality assessment and analysis of different epidemiological studies conducted at RKI. Since 2015 she is involved in Burden of Disease assessments and is the methodological leader of the Germany BURDEN2020 Project. Previous experience include work in the sphere of social and demographic statistics, poverty measures, family and fertility behavior in Eastern European countries. She has experience in analysing complex longitudinal and cross-sectional data.

Grant Wyper, Public Health Scotland, UK

Mr. Grant Wyper is a Public Health Intelligence Adviser in at Public Health Scotland in Glasgow, United Kingdom. He studied Mathematics, Statistics and Accounting, and obtained his MSc in Statistics. He has been working for the National Health Service in Scotland, since 2007, across public health, and statistics, institutes. Since 2014, Grant has been involved in the Scottish Burden of Disease study, and has wider interests in population health surveillance, evaluation of public health interventions, and effective scientific communication. Recently his focus has been on defining the methodology and integration of COVID-19 into burden of disease assessments in Scotland. Previous experiences include work on clinical effectiveness and safety studies.