

# EUBIROD contributions to OECD projects 2017: standardized definitions of amputations and distributed approach to global hospital performance benchmarking

**Fabrizio Carinci**

Visiting Professor, University of Surrey, UK

Adjunct Professor of Biostatistics, University of Bologna, Italy

[f.carinci@surrey.ac.uk](mailto:f.carinci@surrey.ac.uk)

# OECD Health Care Quality Indicators Project

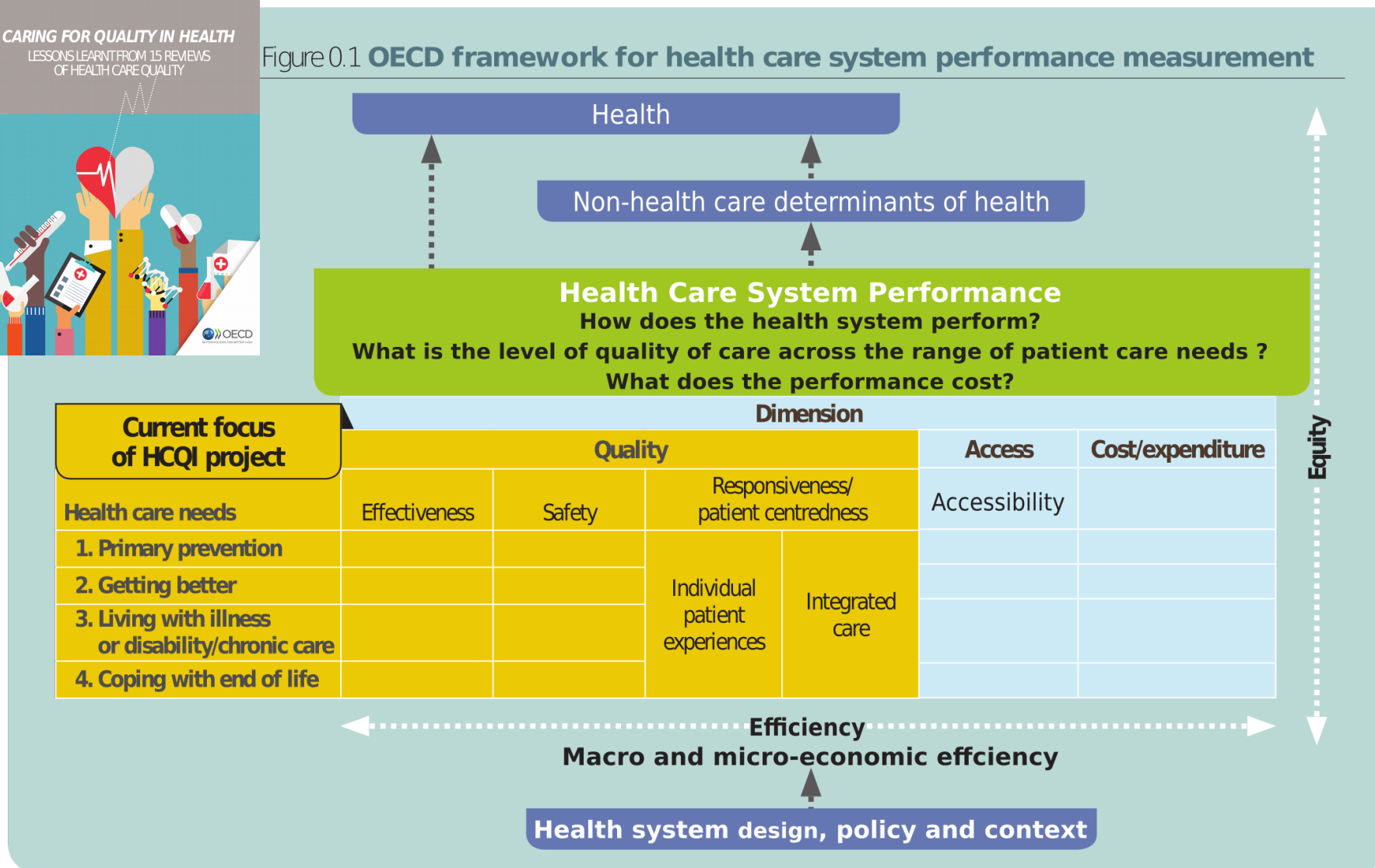
- Under the umbrella of the Organisation for Economic Cooperation and Development (OECD), the ‘Health Care Quality Indicators’ (HCQI) Project was initiated in 2001
- The general objective was to help Member States (MS) identify **priority areas for quality improvement** to provide **achievable standards** by examining results among best performing countries
- In 2006, the OECD released a **common conceptual framework for health system performance**. Nested “quality matrix” with **vertical dimensions** of ‘effectiveness’, ‘patient safety’ and ‘responsiveness/patient-centeredness’, **horizontally subdivided according to levels of health care needs over the life cycle**: ‘staying healthy’ for healthy subjects, ‘getting better’ for people affected by a disease, ‘living with illness or disability’ for those with a chronic condition and ‘coping with end of life’ for terminal patients.

# Caring for quality in health, OECD 2017

<https://www.oecd.org/els/health-systems/Caring-for-Quality-in-Health-Final-report.pdf>



Figure 0.1 OECD framework for health care system performance measurement



Source: Carinci, F. et al. (2015), "Towards Actionable International Comparisons of Health System Performance: Expert Revision of the OECD Framework and Quality Indicators", *International Journal for Quality in Health Care*, Vol. 27, No. 2, pp. 137-146, <http://dx.doi.org/10.1093/intqhc/mzv004>.

# Guidelines for Lower Amputations in Diabetes, OECD 2013

Diabetes lower extremity amputation and diabetes diagnosis codes:

ICD-9-CM	ICD-10-WHO
<i>Procedure codes for lower-extremity amputation excluding toe</i>	<i>Procedure codes for lower-extremity amputation excluding toe</i>
8410 LOWER LIMB AMPUTAT NOS	NOT SPECIFIED
8412 AMPUTATION THROUGH FOOT	
8413 DISARTICULATION OF ANKLE	
8414 AMPUTAT THROUGH MALLEOLI	
8415 BELOW KNEE AMPUTAT NEC	
8416 DISARTICULATION OF KNEE	
8417 ABOVE KNEE AMPUTATION	
8418 DISARTICULATION OF HIP	
8419 HINDQUARTER AMPUTATION	
<i>Diagnosis Codes For Diabetes:</i>	<i>Diagnosis codes for diabetes:</i>
25000 DMII WO CMP NT ST UNCNR	E10.0 INSULIN-DEPENDENT DIABETES MELLITUS WITH COMA
25001 DMI WO CMP NT ST UNCNR	E10.1 INSULIN-DEPENDENT DIABETES MELLITUS WITH KETOACIDOSIS
25002 DMII WO CMP UNCTR	E10.2 INSULIN-DEPENDENT DIABETES MELLITUS WITH RENAL COMPLICATIONS
25003 DMI WO CMP UNCTR	E10.3 INSULIN-DEPENDENT DIABETES MELLITUS WITH OPHTHALMIC COMPLICATIONS
25010 DMII KETO NT ST UNCTR	E10.4 INSULIN-DEPENDENT DIABETES MELLITUS WITH NEUROLOGICAL COMPLICATIONS
25011 DMI KETO NT ST UNCTR	E10.5 INSULIN-DEPENDENT DM WITH PERIPHERAL CIRCULATORY COMPLICATIONS
25012 DMII KETOACD UNCTR	E10.6 INSULIN-DEPENDENT DM WITH OTHER SPECIFIED COMPLICATIONS
25013 DMI KETOACD UNCTR	E10.7 INSULIN-DEPENDENT DIABETES MELLITUS WITH MULTIPLE COMPLICATIONS
25020 DMII HPRSM NT ST UNCTR	E10.8 INSULIN-DEPENDENT DIABETES MELLITUS WITH UNSPECIFIED COMPLICATIONS
25021 DMI HPRSM NT ST UNCTR	E10.9 INSULIN-DEPENDENT DIABETES MELLITUS WITHOUT COMPLICATIONS
25022 DMII HPROSMR UNCTR	E11.0 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH COMA
25023 DMI HPROSMR UNCTR	E11.1 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH KETOACIDOSIS
25030 DMII O CM NT ST UNCTR	E11.2 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH RENAL COMPLICATIONS
25031 DMI O CM NT ST UNCTR	E11.3 NON-INSULIN-DEPENDENT DM WITH OPHTHALMIC COMPLICATIONS
25032 DMII OTH COMA UNCTR	E11.4 NON-INSULIN-DEPENDENT DM WITH NEUROLOGICAL COMPLICATIONS
25033 DMI OTH COMA UNCTR	E11.5 NON-INSULIN-DEPENDENT DM WITH PERIPHERAL CIRCULATORY COMPLICATIONS
25040 DMII RENL NT ST UNCTR	E11.6 NON-INSULIN-DEPENDENT DM WITH OTHER SPECIFIED COMPLICATIONS
25041 DMI RENL NT ST UNCTR	E11.7 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITH MULTIPLE COMPLICATIONS
25042 DMII RENAL UNCTR	E11.8 NON-INSULIN-DEPENDENT DM WITH UNSPECIFIED COMPLICATIONS
25043 DMI RENAL UNCTR	E11.9 NON-INSULIN-DEPENDENT DIABETES MELLITUS WITHOUT COMPLICATIONS
25050 DMII OPHTH NT ST UNCTR	E13.0 OTHER SPECIFIED DIABETES MELLITUS WITH COMA
25051 DMI OPHTH NT ST UNCTR	E13.1 OTHER SPECIFIED DIABETES MELLITUS WITH KETOACIDOSIS
25052 DMII OPHTH UNCTR	E13.2 OTHER SPECIFIED DIABETES MELLITUS WITH RENAL COMPLICATIONS
25053 DMI OPHTH UNCTR	E13.3 OTHER SPECIFIED DIABETES MELLITUS WITH OPHTHALMIC COMPLICATIONS
25060 DMII NEURO NT ST UNCTR	E13.4 OTHER SPECIFIED DIABETES MELLITUS WITH NEUROLOGICAL COMPLICATIONS
25061 DMI NEURO NT ST UNCTR	
25062 DMII NEURO UNCTR	
25063 DMI NEURO UNCTR	
25070 DMII CIRC NT ST UNCTR	
25071 DMI CIRC NT ST UNCTR	
25072 DMII CIRC UNCTR	
25073 DMI CIRC UNCTR	
25080 DMII OTH NT ST UNCTR	
25081 DMI OTH NT ST UNCTR	
25082 DMII OTH UNCTR	
25083 DMI OTH UNCTR	
25090 DMII UNSPF NT ST UNCTR	
25091 DMI UNSPF NT ST UNCTR	
25092 DMII UNSPF UNCTR	
25093 DMI UNSPF UNCTR	

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	E13.5 OTHER SPECIFIED DM WITH PERIPHERAL CIRCULATORY COMPLICATIONS
	E13.6 OTHER SPECIFIED DIABETES MELLITUS WITH OTHER SPECIFIED COMPLICATIONS
	E13.7 OTHER SPECIFIED DIABETES MELLITUS WITH MULTIPLE COMPLICATIONS
	E13.8 OTHER SPECIFIED DIABETES MELLITUS WITH UNSPECIFIED COMPLICATIONS
	E13.9 OTHER SPECIFIED DIABETES MELLITUS WITHOUT COMPLICATIONS
	E14.0 UNSPECIFIED DIABETES MELLITUS WITH COMA
	E14.1 UNSPECIFIED DIABETES MELLITUS WITH KETOACIDOSIS
	E14.2 UNSPECIFIED DIABETES MELLITUS WITH RENAL COMPLICATIONS
	E14.3 UNSPECIFIED DIABETES MELLITUS WITH OPHTHALMIC COMPLICATIONS
	E14.4 UNSPECIFIED DIABETES MELLITUS WITH NEUROLOGICAL COMPLICATIONS
	E14.5 UNSPECIFIED DM WITH PERIPHERAL CIRCULATORY COMPLICATIONS
	E14.6 UNSPECIFIED DIABETES MELLITUS WITH OTHER SPECIFIED COMPLICATIONS
	E14.7 UNSPECIFIED DIABETES MELLITUS WITH MULTIPLE COMPLICATIONS
	E14.8 UNSPECIFIED DIABETES MELLITUS WITH UNSPECIFIED COMPLICATIONS
	E14.9 UNSPECIFIED DIABETES MELLITUS WITHOUT COMPLICATIONS

Exclude trauma diagnosis codes:

ICD-9-CM	ICD-10-WHO
8950 AMPUTATION TOE	S78.0 TRAUMATIC AMPUTATION AT HIP JOINT
8951 AMPUTATION TOE-COMPLICAT	S78.1 TRAUMATIC AMPUTATION AT LEVEL BETWEEN HIP AND KNEE
8960 AMPUTATION FOOT, UNILAT	S78.9 TRAUMATIC AMPUTATION OF HIP AND THIGH, LEVEL UNSPECIFIED
8961 AMPUT FOOT, UNILAT-COMPL	S88.0 TRAUMATIC AMPUTATION AT KNEE LEVEL
8962 AMPUTATION FOOT, BILAT	S88.1 TRAUMATIC AMPUTATION AT LEVEL BETWEEN KNEE AND ANKLE
8963 AMPUTAT FOOT, BILAT-COMP	S88.9 TRAUMATIC AMPUTATION OF LOWER LEG, LEVEL UNSPECIFIED
8970 AMPUT BELOW KNEE, UNILAT	S98.0 TRAUMATIC AMPUTATION OF FOOT AT ANKLE LEVEL
8971 AMPUTAT BK, UNILAT-COMPL	S98.1 TRAUMATIC AMPUTATION OF ONE TOE
8972 AMPUT ABOVE KNEE, UNILAT	S98.2 TRAUMATIC AMPUTATION OF TWO OR MORE TOES
8973 AMPUT ABV KN, UNIL-COMPL	S98.3 TRAUMATIC AMPUTATION OF OTHER PARTS OF FOOT
8974 AMPUTAT LEG, UNILAT NOS	S98.4 TRAUMATIC AMPUTATION OF FOOT, LEVEL UNSPECIFIED
8975 AMPUT LEG, UNIL NOS-COMP	T03.3 TRAUMATIC AMPUTATION OF BOTH FEET
8976 AMPUTATION LEG, BILAT	T03.4 TRAUMATIC AMPUTATION OF 1 FOOT AND OTHER LEG [ANY LEVEL, EXCEPT FOOT]
8977 AMPUTAT LEG, BILAT-COMPL	T03.5 TRAUMATIC AMPUTATION OF BOTH LEGS [ANY LEVEL]
	T13.6 TRAUMATIC AMPUTATION OF LOWER LIMB, LEVEL UNSPECIFIED

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## Lower extremity amputation rates in people with diabetes as an indicator of health systems performance. A critical appraisal of the data collection 2000–2011 by the Organization for Economic Cooperation and Development (OECD)

F. Carinci<sup>1</sup> · M. Massi Benedetti<sup>2</sup> · N. S. Klazinga<sup>3,4</sup> · L. Uccioli<sup>5</sup>

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**Table 3** Results of multivariate linear regression (generalized estimating equations), OECD 2000–2011 *Source* OECD health system characteristics survey, 2012; health care quality indicators project (revised version, data collection 2013)

Model/Variable	Estimate	S.E.	95 %C.I.	<i>P</i> > <i>Z</i>
<b>Model 1 [Complete dataset; N countries = 26]</b>				
Tax-based system	-4.55	1.95	-8.38, -0.72	0.020
Use of registry	2.93	2.53	-2.03, 7.89	0.247
Non-ICD coding	-7.04	2.14	-11.24, -2.84	0.001
Average year change	-0.27	0.11	-0.50, -0.05	0.015
<b>Model 2 [Financing: Tax-based; N countries = 12; Median LEARD: 7.55 (2000), 6.25 (2011)]</b>				
Average Year Change	-0.16	0.09	-0.33, 0.01	0.064
<b>Model 2 [Financing: Social insurance; N countries = 14; Median LEARD: 17.50 (2000), 8.15 (2011)]</b>				
Average year change	-0.36	0.18	-0.71, -0.01	0.046

# Room Material, HCQI 2014

OECD RAPID R&D STUDY 2014  
Coordinated by the ITALIAN MINISTRY OF HEALTH  
with the support of the EUBIROD NETWORK

STANDARDIZED DEFINITIONS AND CALCULATION OF  
LOWER EXTREMITY AMPUTATION RATES IN DIABETES  
FOR THE OECD HEALTH CARE QUALITY INDICATORS PROJECT

FINAL REPORT

30<sup>th</sup> October 2014

Coordinating Team

Fabrizio Carinci, [research@fabcarinci.net](mailto:research@fabcarinci.net)  
Massimo Massi Benedetti, [massi@hirs-research.eu](mailto:massi@hirs-research.eu)  
on behalf of the EUBIROD NETWORK

Luigi Uccioli, [luciolli@yahoo.com](mailto:luciolli@yahoo.com)  
UNIVERSITA' DEGLI STUDI DI ROMA "TOR VERGATA"

Flavia Carle, [fcarle@sanita.it](mailto:fcarle@sanita.it)  
Silvia Donno, [s.donno-esterno@sanita.it](mailto:s.donno-esterno@sanita.it)  
Paola Pisanti, [p.pisanti@sanita.it](mailto:p.pisanti@sanita.it)  
ITALIAN MINISTRY OF HEALTH

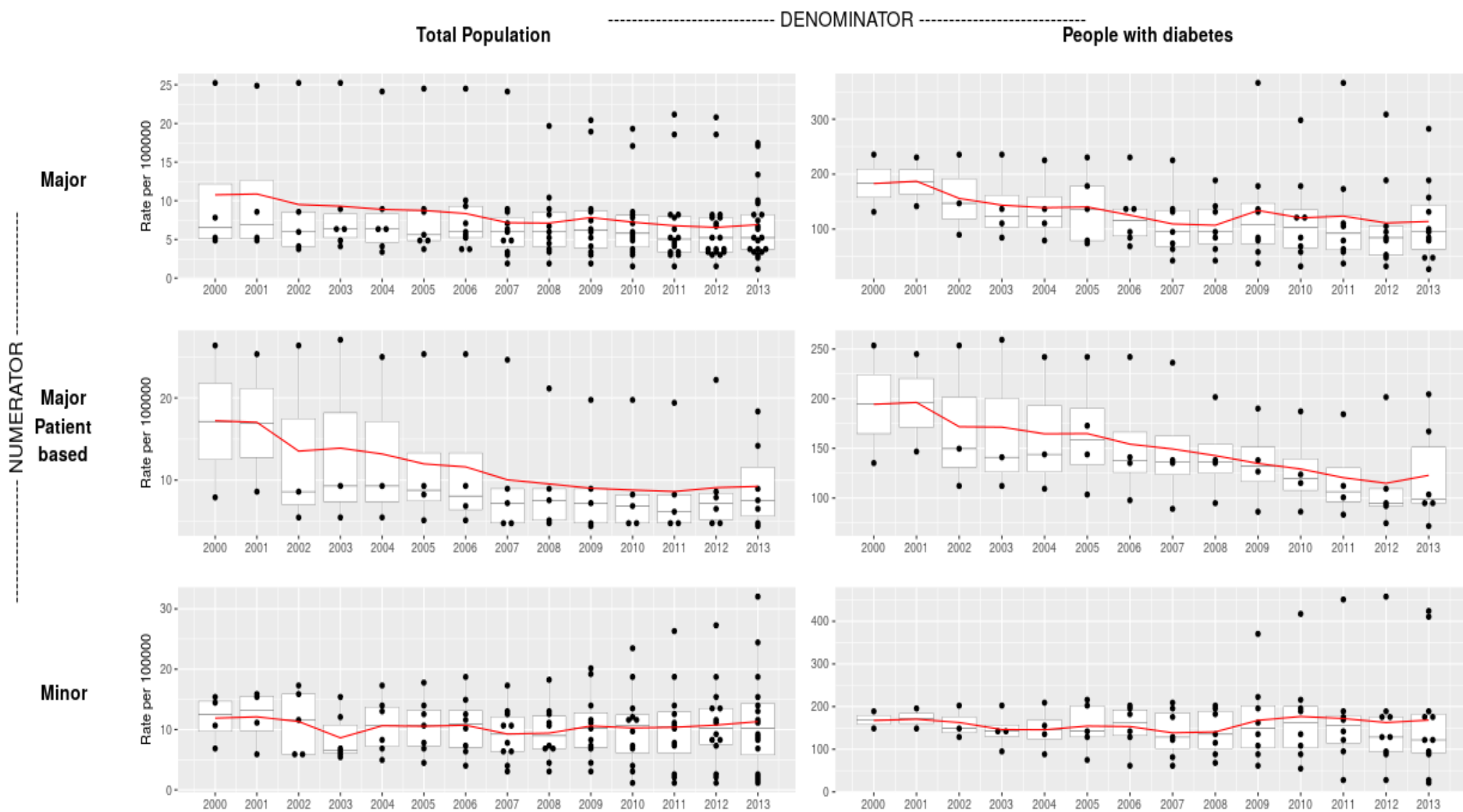
# Guidelines for Lower Amputations in Diabetes, OECD 2015

## Diabetes major lower extremity amputation and diabetes diagnosis codes:

ICD-9-CM	ICD-10-WHO
<p>Procedure codes for <b>major</b> lower-extremity amputation</p> <p>8413 DISARTICULATION OF ANKLE            8414 AMPUTAT THROUGH MALLEOLI            8415 BELOW KNEE AMPUTAT NEC            8416 DISARTICULATION OF KNEE            8417 ABOVE KNEE AMPUTATION            8418 DISARTICULATION OF HIP            8419 HINDQUARTER AMPUTATION</p> <p><b>Diagnosis Codes For Diabetes:</b></p> <p>25000 DMII WO CMP NT ST UNCNTR            25001 DMI WO CMP NT ST UNCNTRI</p>	<p>Procedure codes for <b>major</b> lower-extremity amputation</p> <p>NOT SPECIFIED</p> <p><b>Diagnosis codes for diabetes:</b></p> <p>E10.0 INSULIN-DEPENDENT DIABETES            MELLITUS WITH COMA            E10.1 INSULIN-DEPENDENT DIABETES            MELLITUS WITH KETOACIDOSIS            E10.2 INSULIN-DEPENDENT DIABETES            MELLITUS WITH RENAL COMPLICATIONS            E10.3 INSULIN-DEPENDENT DIABETES            MELLITUS WITH OPHTHALMIC COMPLICATIONS</p>

# Results of Lower Extremity Amputation Rates in Diabetes

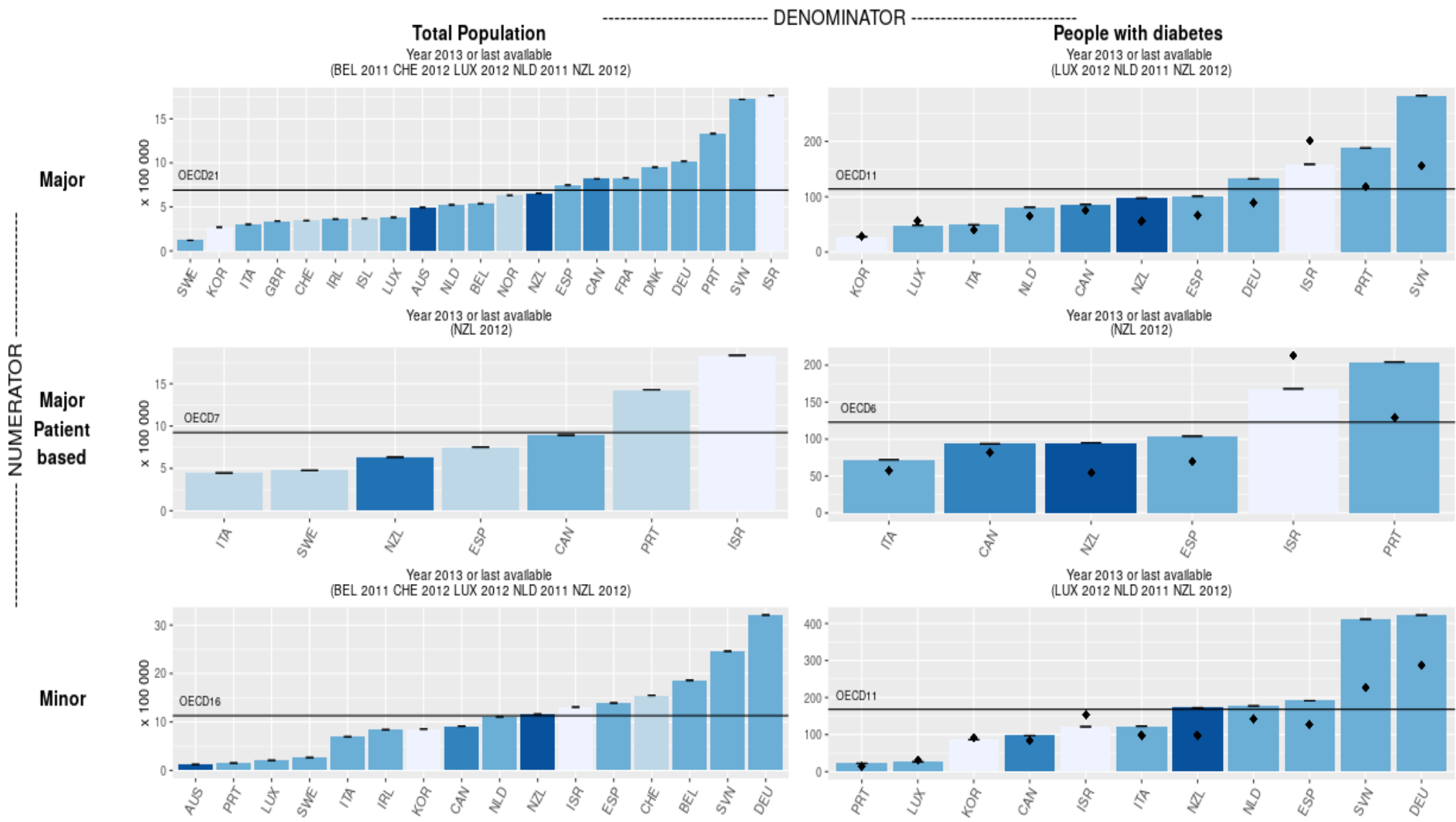
Standardized Rates by Country (Age  $\geq 15$  yrs), Year 2013 or last year available





# Results of Lower Extremity Amputation Rates in Diabetes

Standardized Rates by Country (Age ≥ 15 yrs), Year 2013 or last year available



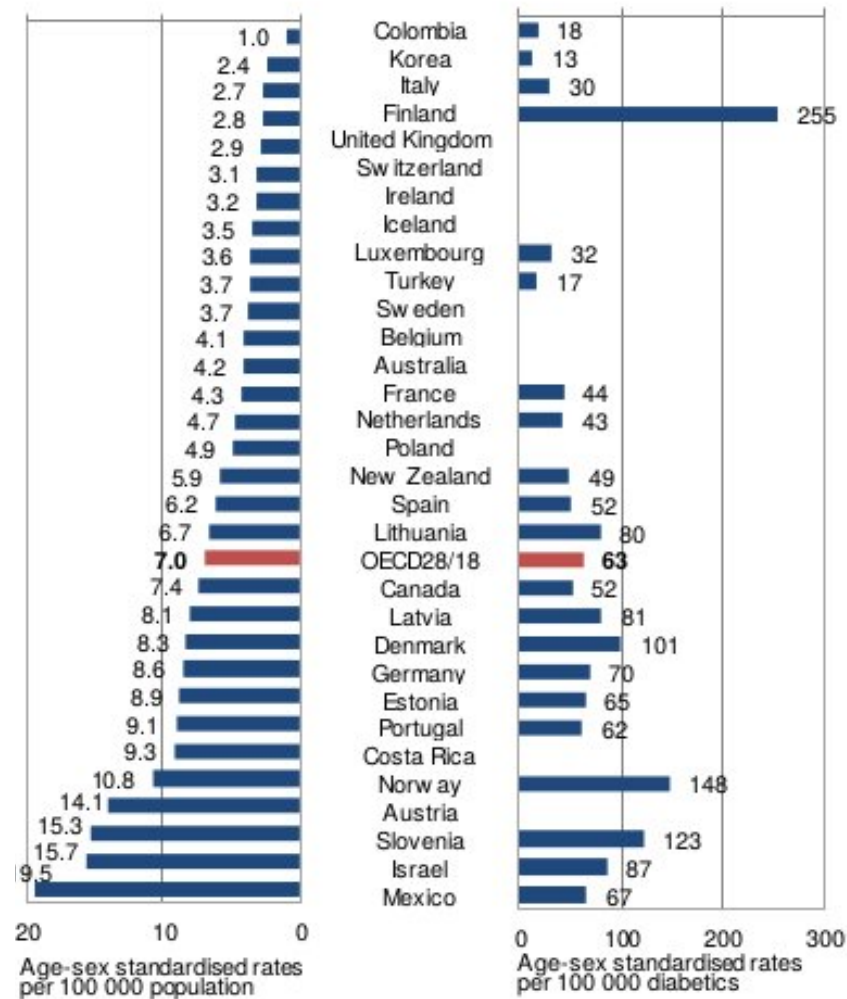
# Lower extremity amputations in diabetes: results of Multivariate Modelling (Generalized Estimating Equations), OECD 2000-2013

	<u>Minor</u>				<u>Major</u>			
	<u>People with Diabetes</u>		<u>Total Population</u>		<u>People with Diabetes</u>		<u>Total Population</u>	
<i>Linear Regression*</i>								
Variable	Estimate (95 %C.I.)	P>Z	Estimate (95% C.I.)	P>Z	Estimate (95 %C.I.)	P>Z	Estimate (95 %C.I.)	P>Z
<i>Model 1 (All)**</i>								
Average Year Change	-1.96 (-4.02, 0.11)	0.06	0.12 (-0.07, 0.31)	0.23	-4.52 (-6.09,-2.94)	<0.001	-0.19 (-0.36,-0.02)	0.03
<i>Model 2 (Tax-based)</i>								
Average Year Change	-1.09 (-2.63, 0.46)	0.17	<b>0.17 ( 0.08, 0.26)</b>	<0.001	-3.56 (-5.08,-2.05)	<0.001	<b>-0.09 (-0.13,-0.05)</b>	<0.001
<i>Model 3 (Insurance-based)</i>								
Average Year Change	-1.88 (-4.43, 0.67)	0.15	0.13 (-0.18, 0.44)	0.41	-5.43 (-6.87,-3.99)	<0.001	-0.25 (-0.51, 0.01)	0.06
<i>Poisson Regression §</i>								
Variable	IRR (95% C.I.)	P>χ <sup>2</sup>	IRR (95% C.I.)	P>χ <sup>2</sup>	IRR (95% C.I.)	P>χ <sup>2</sup>	IRR (95% C.I.)	P>χ <sup>2</sup>
<i>Model 4 (All)</i>								
Age	<b>1.20 (1.06,1.35)</b>	0	<b>1.87 (1.81,1.94)</b>	<0.001	<b>1.46 (1.36,1.56)</b>	<0.001	<b>2.05 (1.94,2.16)</b>	<0.001
Males	<b>3.05 (2.71,3.43)</b>	<0.001	<b>3.51 (3.03,4.07)</b>	<0.001	<b>2.20 (2.06,2.35)</b>	<0.001	<b>2.48 (2.23,2.76)</b>	<0.001
Insurance-based	<b>2.42 (1.08,5.45)</b>	0.03	<b>2.99 (1.69,5.28)</b>	<0.001	<b>2.03 (1.17,3.54)</b>	0.01	<b>1.86 (1.05,3.28)</b>	0.03
Registry	<b>2.36 (2.00,2.78)</b>	<0.001	1.07 (0.75,1.52)	0.7	<b>2.12 (1.94,2.32)</b>	<0.001	0.92 (0.57,1.50)	0.750
Coding: non ICD9/derived	<b>0.20 (0.11,0.36)</b>	<0.001	<b>0.36 (0.25,0.53)</b>	<0.001	<b>0.17 (0.15,0.20)</b>	<0.001	<b>0.51 (0.31,0.85)</b>	0.01
Average Year Change	1.00 (0.98,1.02)	0.810	<b>1.02 (1.01,1.04)</b>	0.01	<b>0.96 (0.95,0.98)</b>	<0.001	<b>0.99 (0.97,1.00)</b>	0.03

# Lower extremity amputations in diabetes, 2015

Source: OECD Health at a Glance 2017

6.13. Major lower extremity amputation in adults with diabetes, 2015 (or nearest year)



Note: Three-year average for Iceland and Luxembourg.

Source: OECD Health Statistics 2017.

# OECD HCQI Project on Hospital Performance Benchmarking

(<http://www.oecd.org/health/health-systems/health-meetings-presentations.htm>)



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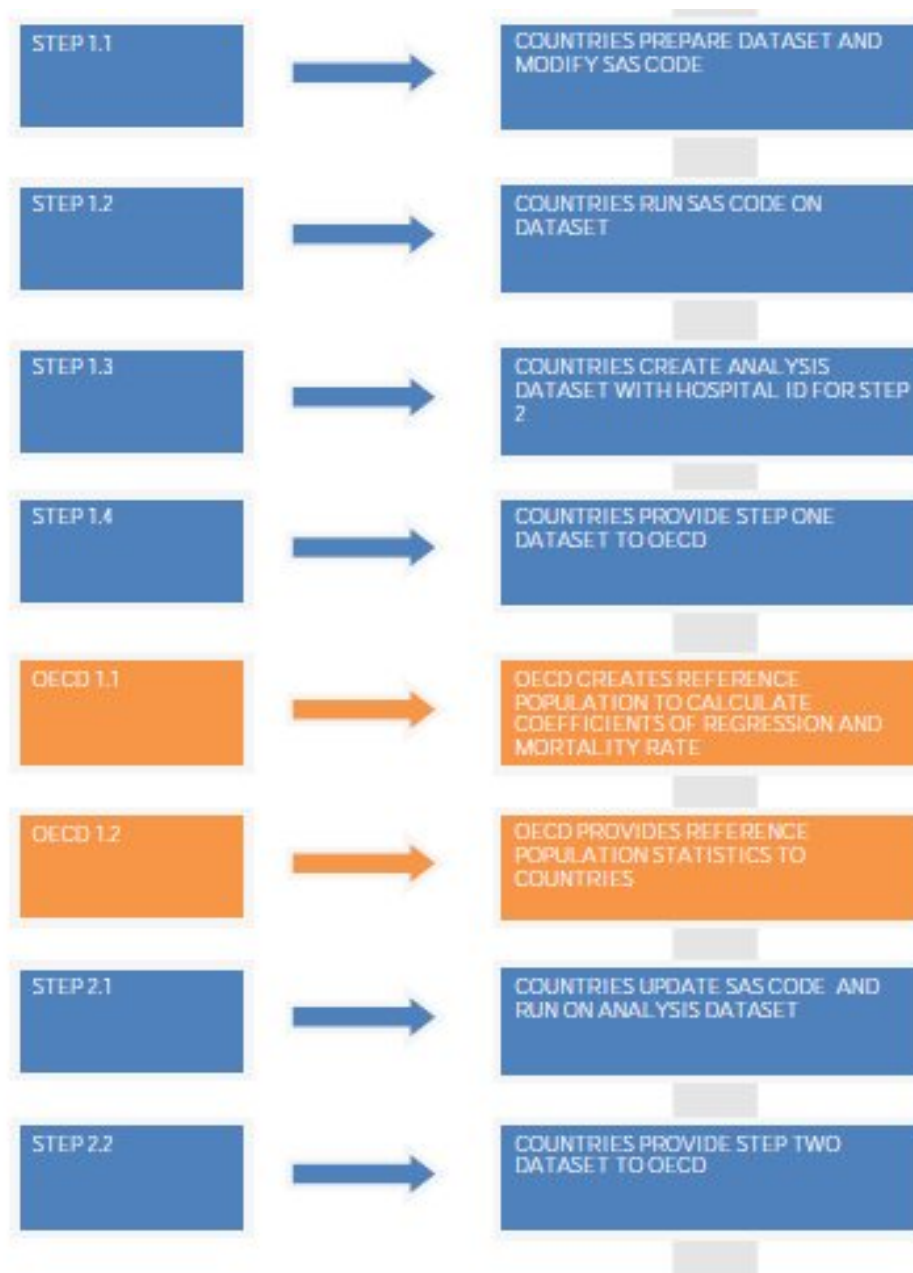


## Surrey Group Members

- Enrique Bernal-Delgado (ECHO Project)
- Fabrizio Carinci (EUBIROD Project)
- Yana Gurevich (Canada)
- Unto Häkkinen (EuroHOPE Project)
- Mark Joy (University of Surrey)
- Sunita Karmakar-Hore (Canada)
- Sun Min Kim (Korea)
- Toshiro Kumakawa (Japan)
- Sadaf Marashi-Pour (NSW Bureau of Health Information, Australia)
- Mikko Peltola (EuroHOPE Project)
- Veena Raleigh (UK)
- Patrick Romano (UC Davis, US)
- Vladimir Stevanovic, (NZ)
- Kim Sutherland (NSW Bureau of Health Information, Australia)

# OECD HCQI Project on Hospital Performance Benchmarking

(<http://www.oecd.org/health/health-systems/health-meetings-presentations.htm>)



# OECD HCQI Project on Hospital Performance Benchmarking

(<http://www.oecd.org/health/health-systems/health-meetings-presentations.htm>)



## Progress Since November 2015

- HCQI experts comment on key components **Nov 2015**
- Surrey Group consideration of issues and options **Dec 2015**
- HCQI bureau consideration of recommendations **Jan 2016**
- Preliminary specifications and guidelines prepared **Feb 2016**
  - Testing of SAS code on sample of Finnish data
  - Further consideration by Surrey Group (18 Feb)
  - Additional beta testing by Australia, Finland and NZ
  - Review of initial report on CVD indicators survey (Korea)
  - Revised guidelines considered by HCQI bureau (1 Mar)
- Data collection launched on-line community site **Mar 2016**
- Initial deadline for step 1 data submission **May 2016**

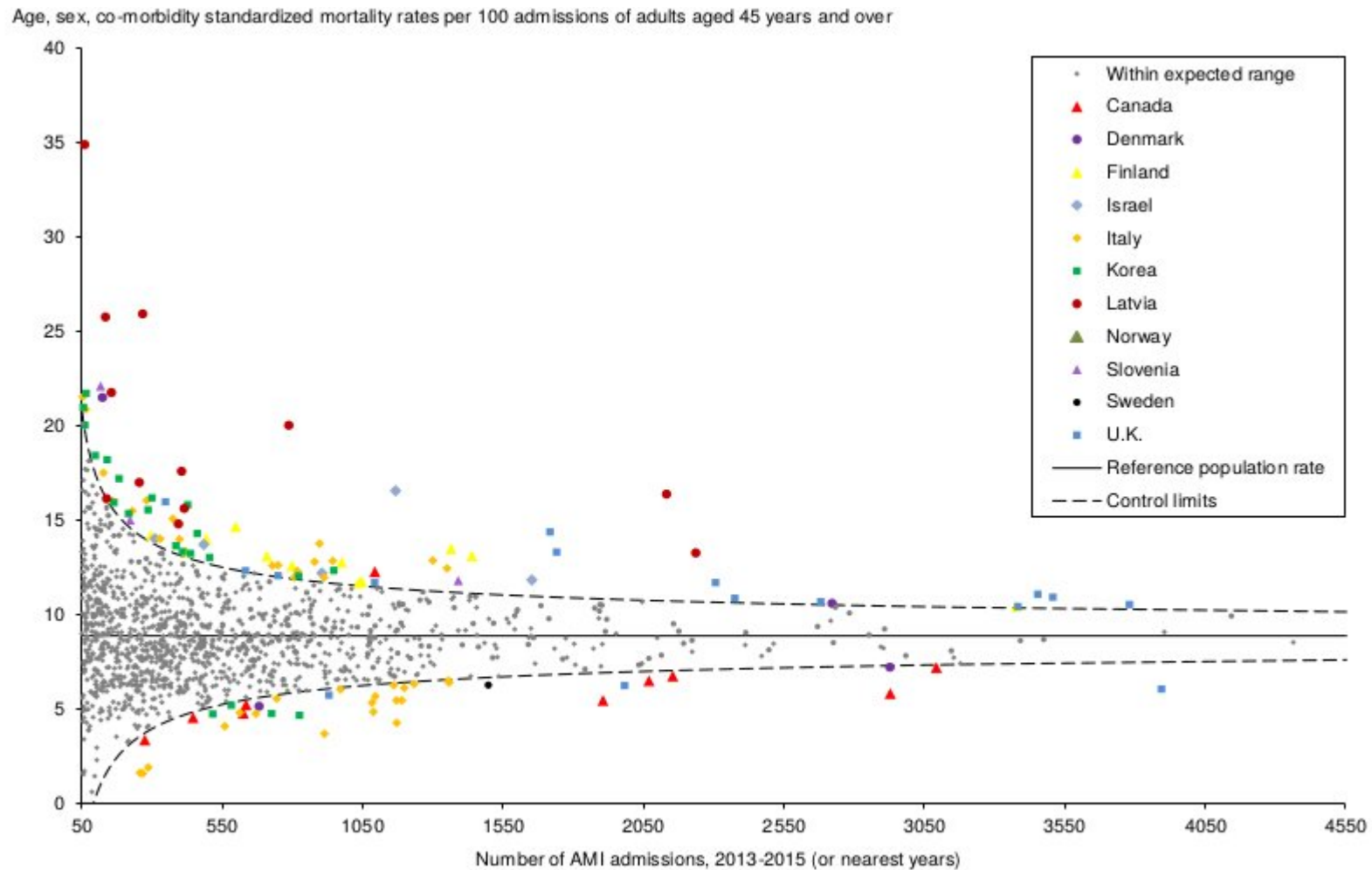
# Progress report on Hospital Performance Reporting, OECD 2017

“The OECD has benefitted enormously from the ground breaking work of existing international programs such as EuroHOPE, ECHO and **EUBIROD, both in terms of methodological development and data collection processes.** While the OECD approach has drawn extensively from the technical specifications utilised in these program, some variations remain. By comparing and contrasting these approaches, work is progressing collaboratively to bring about greater harmonisation”



# Thirty-day mortality after admission to hospital for AMI based on patient data, 2013-2015 (or nearest years)

OECD Health at a Glance, 2017



Note: Data for Canada was not linked to death statistics. UK patient data is presented at trust-level (i.e. multiple hospitals).

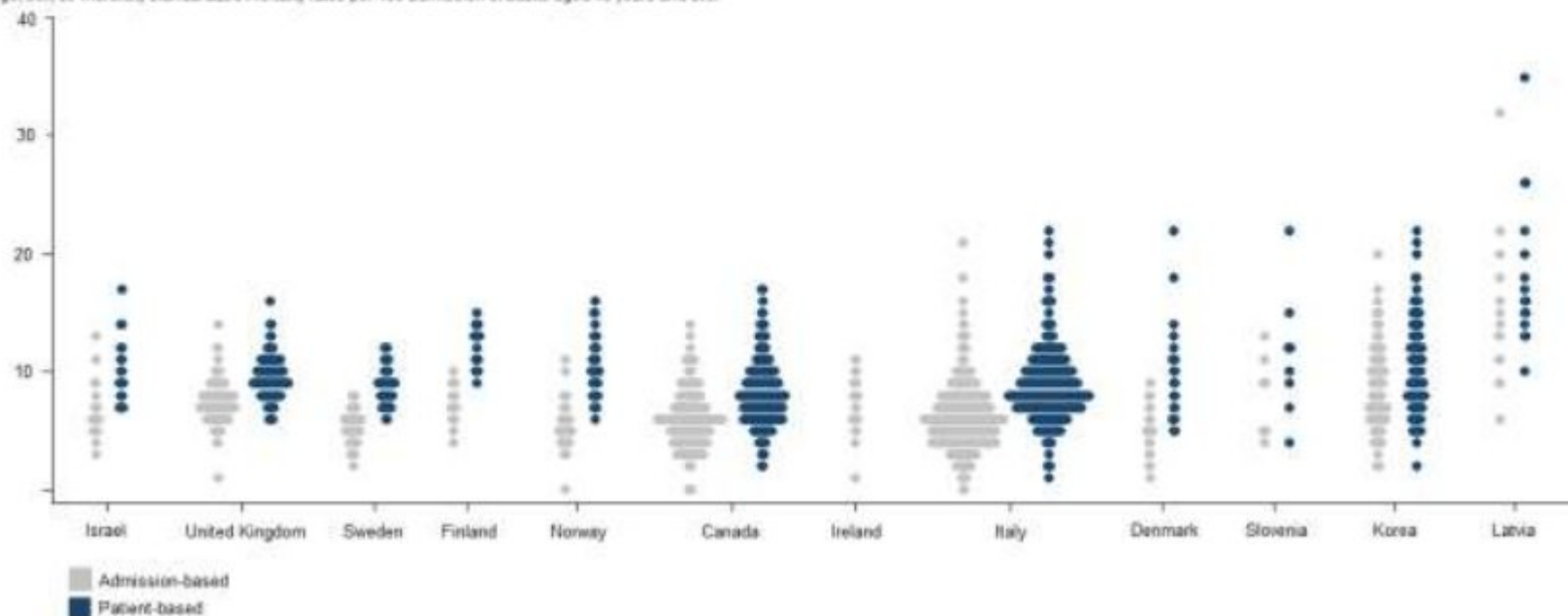
# Thirty-day mortality after admission to hospital for AMI based on patient data, 2013-2015 (or nearest years), OECD Health at a Glance, 2017

**Table 6.1 Number of hospitals by AMI admissions based on admission data, 2013-2015 (or nearest years)**

Number of AMI Admissions	Canada	Denmark	Finland	Israel	Ireland	Italy	Korea	Latvia	Norway	Slovenia	Sweden	United Kingdom
>300	151	21	21	21	20	336	67	6	35	3	62	142
50-300	158	7	0	5	8	160	83	11	17	7	4	8
<50	261	1	0	0	6	328	155	5	2	4	0	59

**6.21 Thirty-day mortality after admission to hospital for AMI based on patient and admission data, 2013-2015 (or nearest years)**

Age, sex, co-morbidity standardized mortality rates per 100 admission of adults aged 45 years and over



# New EU Project, 2018-2021

“Training Health Care Performance Intelligence Professionals to Translate Population Health and Systems Performance Data into Actionable Knowledge” (HEALTHPROS)

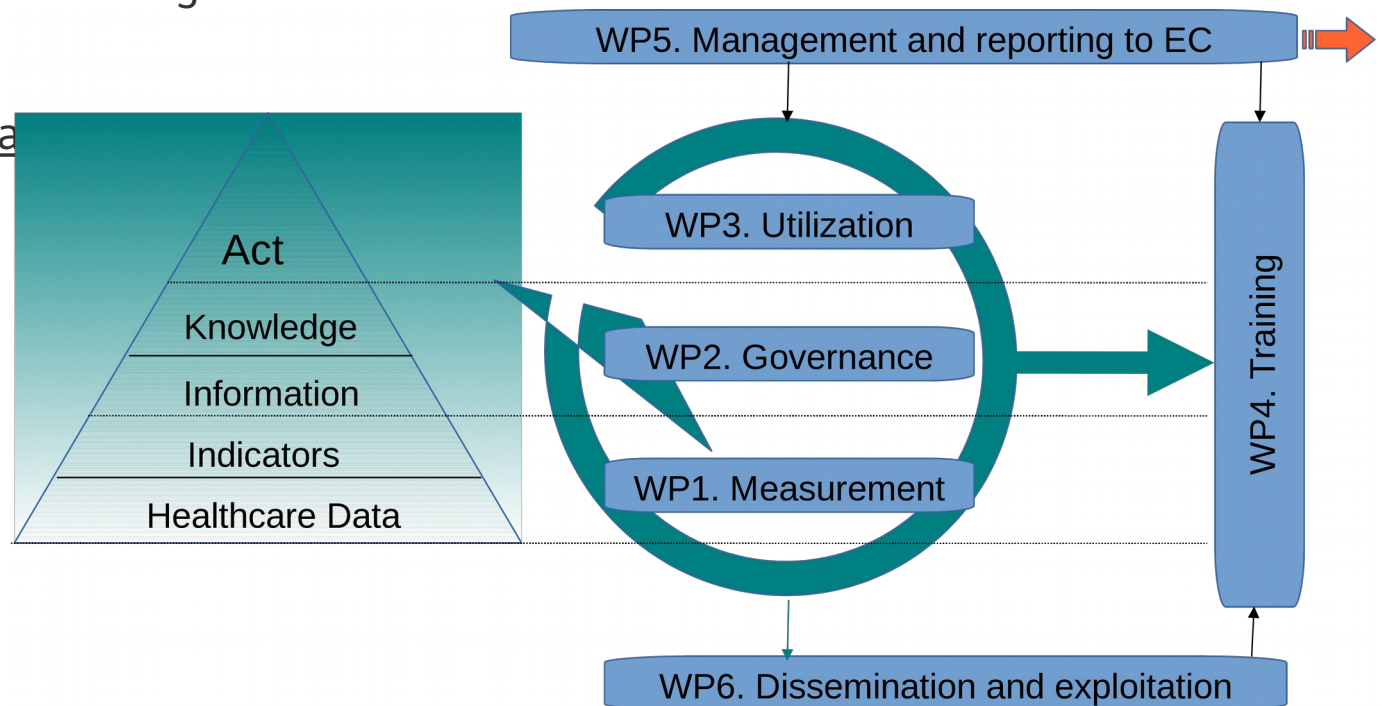
Marie Curie, Innovative Training Network

## Consortium

University of Amsterdam  
Allborg University  
Optimedis  
University of Surrey  
Scuola Sant’Anna  
Corvinus University

## Partners

...  
University of Dundee



# HealthPros: Rotating PhD Students

**HealthPros** will evaluate the IT and statistical needs in an integrated manner, setting the standardized terms of reference for database design, definitions, validation and transformation of data elements required for building quality of care and outcome indicators, as well as structuring robust statistical models for performance evaluation. The scheme will be evaluated across different national frameworks in Scotland, Denmark and **across members of the EUBIROD network**

**ESR11 Project Title: The impact of automated international comparisons using routine large scale databases to improve diabetes care**

**Objectives:** To implement and assess the impact of using an automated system of international comparisons in routine practice. The study will investigate the effect of targeted interventions (including smoking cessation, glycaemic control, and vascular risk management, foot care, vascular surgery) and different organizational arrangements (improved adherence, reduction of vascular risk, frequency of visits, integration of primary/specialist care, minor amputations, continuity of care, etc). Lower extremity complications (eg peripheral arterial disease, major amputations) will be used as a primary endpoint. Application area(s): Reaching better outcomes. Expected Results: Defining new international standards to automate systems performance benchmarking in diabetes. Planned secondments: Hosted at SURREY. Secondment UNIDUND ( $\geq 6$  months) to work on the nationwide Scottish database (SCI-FI). Work visit to RCGP ( $\leq 3$  weeks) to collect views on performance feedback directly from individual consultants; and work visits to other centres of the EUBIROD network (max. 6 weeks) to test the application of the approach in different European contexts.