

Mapping European health statistics with CASPER using Table Joining Services



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INSPIRE GWF conference, 28 may 2015

One Reference Geo-Information Source for Europe

APPLICATIONS MENU

Overview

Health Statistics

Real Estate

Insurance

Emergency Mapping

SEARCH

Search

Health Statistics



As an example of the ELF in action, this part of the project, led by the Geodetic Institute of Slovenia and Kadaster of Netherlands will develop an application for visualising geo-statistics and providing the basis of a geo-statistical reference framework, dealing specifically with the INSPIRE theme of Human Health and Safety.

Human health analysis starts with information on the geographical distribution of such areas as allergies, cancers, and respiratory diseases. For this purpose, health data from environmental, health or statistical agencies will be linked to administrative and/or statistical units using the ELF platform as the authoritative reference of geo-information.

UPCOMING EVENTS

European Forum for Geostatistics

Sofia, Bulgaria

Wednesday, October 23, 2013 to Friday, October 25, 2013

Esri EMEA User Conference

Munich, Germany

Wednesday, October 23, 2013 to Friday, October 25, 2013

TWITTER

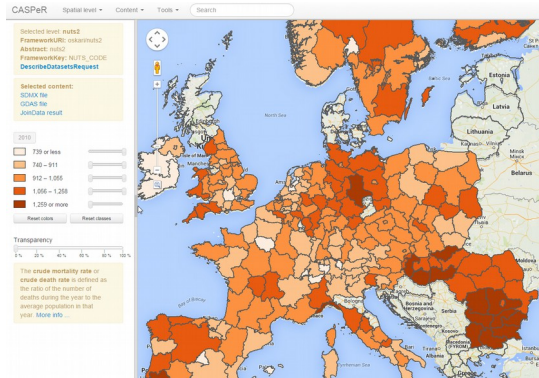
Tweets

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 **ELF Project** 28 Aug
@ELFProjectEU

Presentation of the ELF - European Location Framework on [@slideshare](#) [slideshare.net/ajakobssso](#) at #iccDD2013 via [@Antti.lakobsson](#)

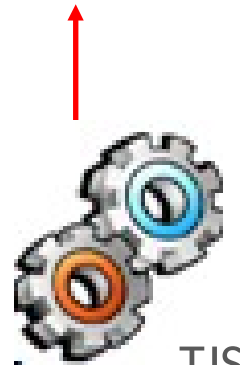
Mapping European health statistics



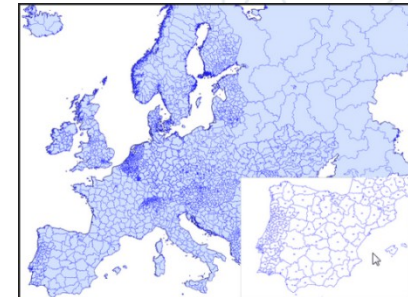
CASPER application

pc4	vypid	woonplaats	adressen	gemeente
5371	3254	Ravenstein	1469	Oss
5371	3256	Deursen-Dennenburg	231	Oss
5371	3257	Huisseling	188	Oss
5371	3263	Overlangel	187	Oss
5371	3259	Dieden	79	Oss
5371	3262	Neerloon	78	Oss
5371	3260	Demem	74	Oss
5371	3261	Neerlangel	28	Oss
5371	3264	Keent	22	Oss

Eurostat's health statistics
(>300 tables)



TJS



EuroboundaryMap
(Eurogeographics)

European (regional) health statistics (EUROSTAT)

European Commission > Eurostat > Data > Database > Population and housing census (cens) and maps

Health (hlth)

European Commission > Eurostat > Data > Database > Population and social conditions

- Population (t_populat)
- Health (t_hlth)
 - Health status (t_hlth_state)
 - ZIP Healthy life years and life expectancy at age 65, by sex (tsdph220) M i
 - ZIP Healthy life years and life expectancy at birth, by sex (tsdph100) M i
 - Health care (t_hlth_care)
 - ZIP Practising physicians (tps00044) i
 - ZIP Licensed physicians (tps00167) i
 - ZIP Practising dentists (tps00045) i
 - ZIP Physicians or doctors by NUTS 2 regions (tgs00062) M i
 - ZIP Dentists by NUTS 2 regions (tgs00063) M i
 - ZIP Hospital beds (tps00046) i
 - ZIP Curative care beds in hospitals (tps00168) i
 - ZIP Psychiatric care beds in hospitals (tps00047) i
 - ZIP Available beds in hospitals by NUTS 2 regions (tgs00064) M i
 - ZIP Discharges from hospitals (tps00048) i
 - ZIP Self reported unmet need for medical examination or treatment, by income quintile (tsdph270)
 - Causes of death (t_hlth_cdeath) (Important information)
 - ZIP Causes of death, by sex (tps00152) i
 - ZIP Death due to cancer, by sex (tps00116) i
 - ZIP Death due to other ischaemic heart diseases, by sex (tps00119) i
 - ZIP Death due to suicide, by sex (tps00122) i
 - ZIP Death due to accidents, by sex (tps00125) i
 - ZIP Death due to transport accidents, by sex (tps00165) i
 - ZIP Death due to pneumonia, by sex (tps00128) i
 - ZIP Death rate due to chronic diseases (tsdph210) M i
 - ZIP Death due to chronic liver disease, by sex (tps00131) i
 - ZIP Accidents at work (ESAW) - until 2007 (nsw_acc7_work) M i

/data/metadata

OGC TJS operations

OGC[®]
Making location count.
www.opengeospatial.org

Service Discovery

- GetCapabilities

Data Access

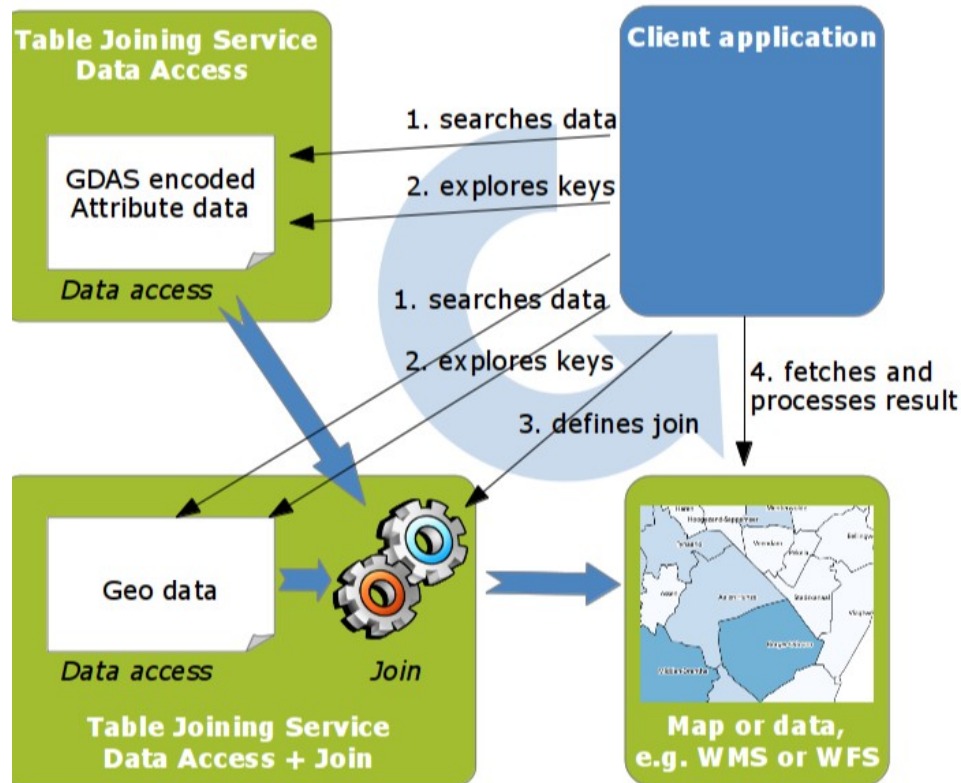
- DescribeFrameworks
- DescribeDatasets
- DescribeData
- GetData

Data Joining

- DescribeJoinAbilities
- DescribeKey
- JoinData

Client application and TJS operations

tabular data



boundary data

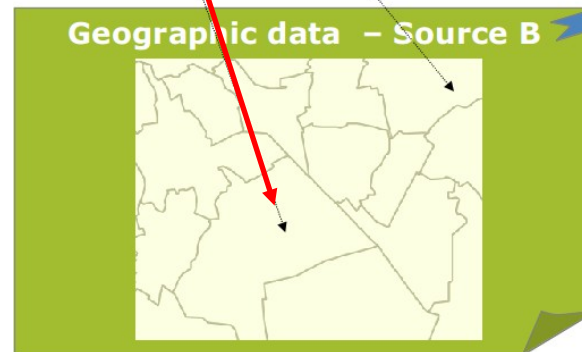
Table joining (service) and unique id's (keys)

tabular data

Attribute data – Source A

Naam	# geldige stemmen	# ongeldige stemmen	# blanco stemmen
Aa en Hunze	19873	11	13
Apeldoorn	7648	9	3
Aalsmeer	17446	42	21
Assteren	18101	13	13
Alkmaar	5424	2	4
Archiefspeken	15887	24	7
Alblasserwaard	10919	20	8
Alblasserwaard	14202	23	13
Alkmaar	53844	77	73
Almelo	37157	84	40
Almere	94134	207	103
Alphen aan den Rijn	41680	76	47
Alphen-Chaam	5626	11	6
Ameland	2933	4	2
Amersfoort	62699	103	61
Amstelveen	45237	71	31
Amsterdam	389006	1648	462
Andijk	3641	0	4

Unique id's
(keys)



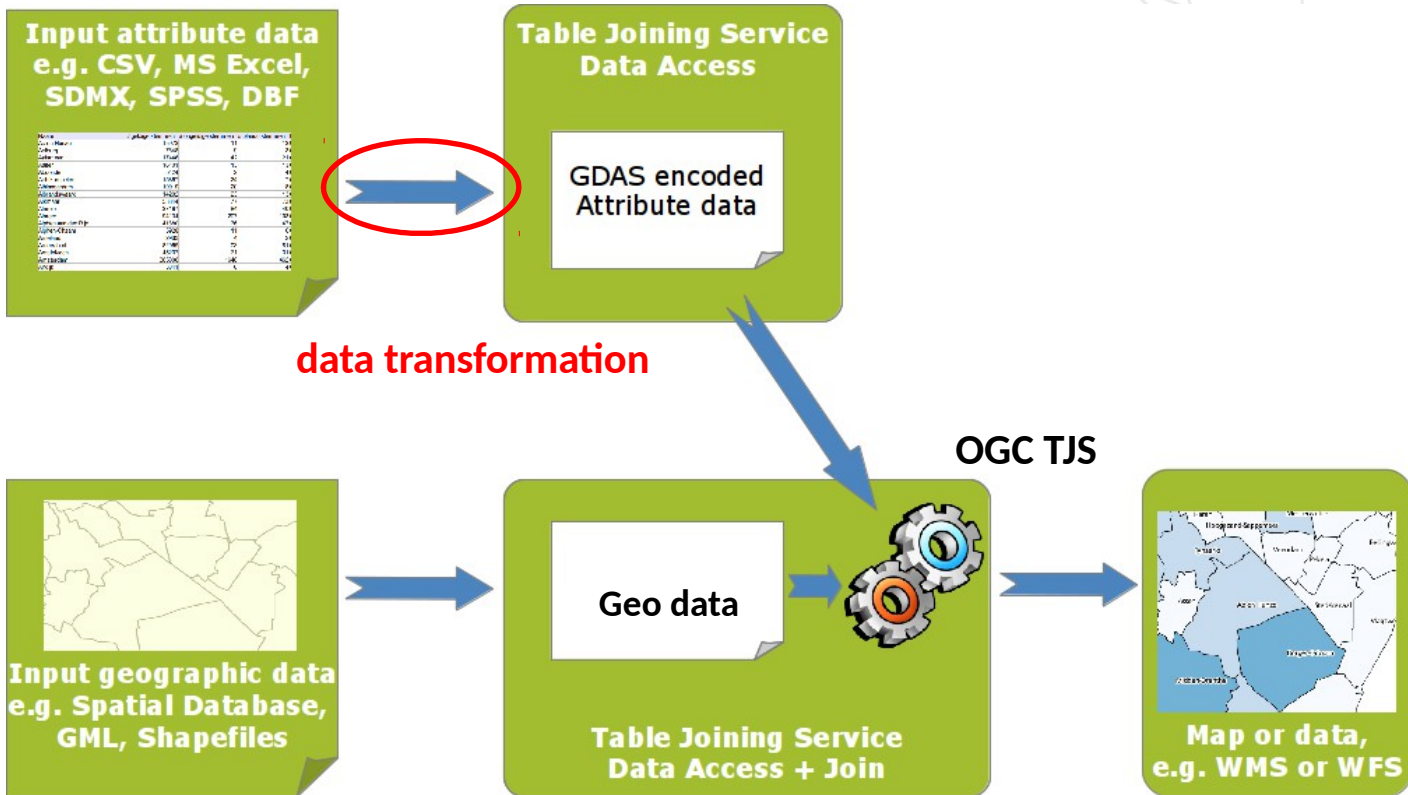
OGC TJS



boundary data

TJS and the GDAS (XML) data format

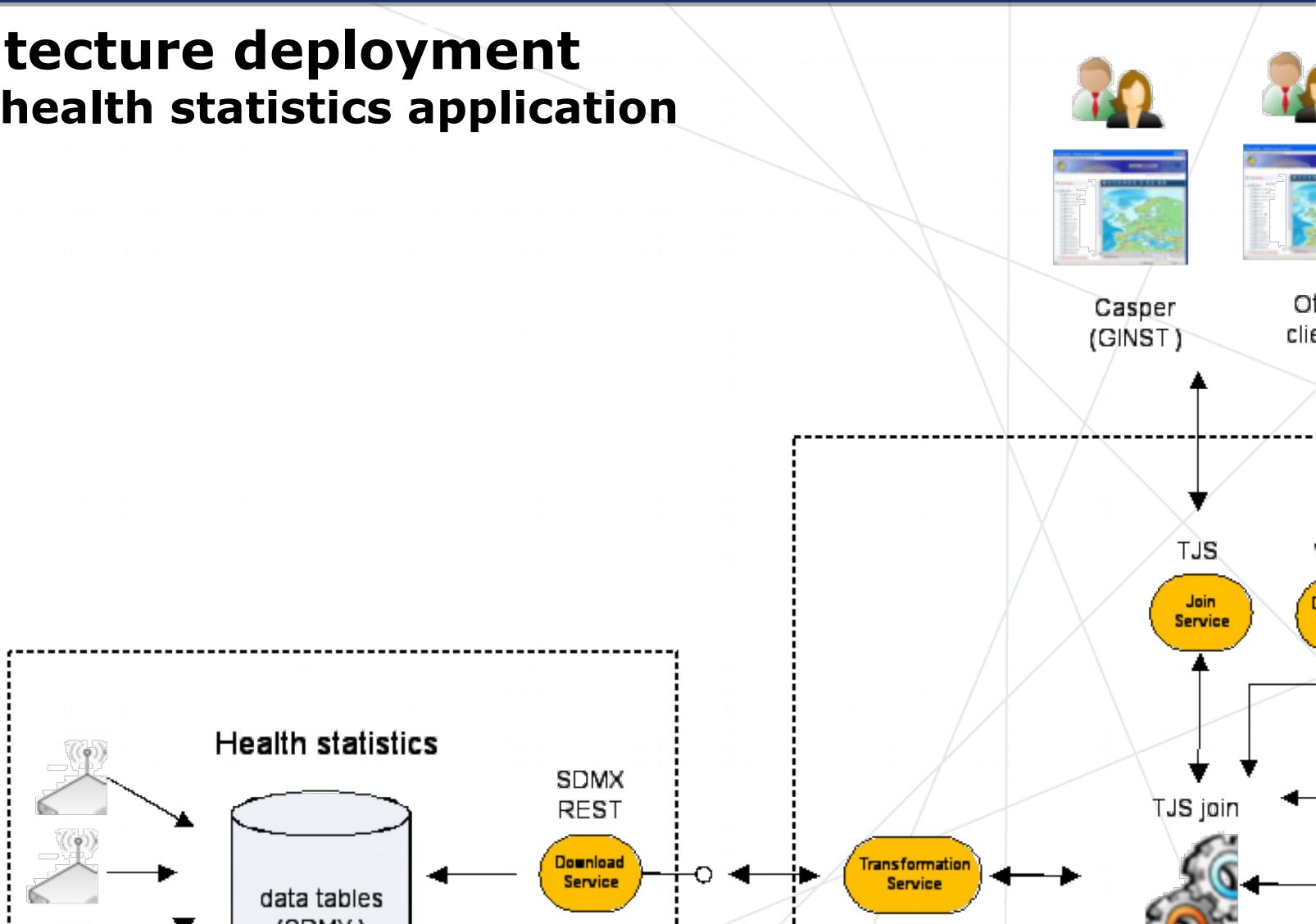
tabular data



boundary data

Architecture deployment

E.L.F. health statistics application



TJS tabular data transformation tool

GDAS Transformation tool

Input standards:

SDMX

Odata - Open Data Protocol

CSV



SDMX is an initiative to foster standards for the exchange of statistical information.

Sponsored by
BIS - ECB - EUROSTAT - IMF - OECD
- UN - World Bank



TJS implementation

TJS as a GEOSERVER community plugin
Open source project

Code public available on GitHub:

https://github.com/thijsbrentjens/geoserver/tree/tjs_2.2.x/

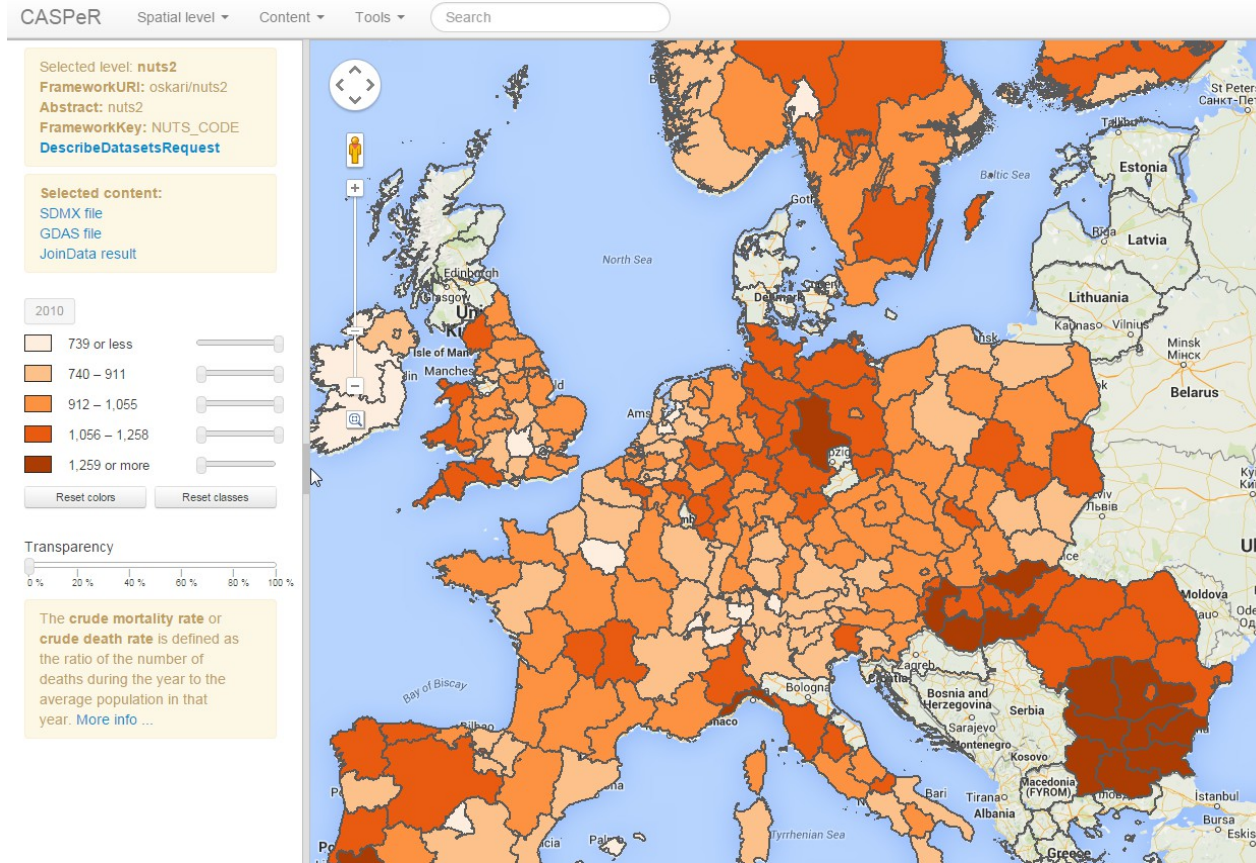
CASPER Client

CASPER is a highly interactive web mapping application that offers mapping of statistical data in choropleth maps.

Data publication platform in CASPER enables **customized** data classification, coloring schemes, client menus, methodological and other notes on the data.

The users of CASPER: Institute of public health, Ministry of Health, private organizations that work in field of health (professional users) and also general public (nonprofessional users).

CASPER Client demo



Upcoming final work (delivery autumn 2015)

- ★ Testing CASPER client connection to all Eurostat regional health statistics tables
- ★ And testing stability of the TJS
- ★ Better integration of data transformation tool into Geoserver for easier deployment
- ★ Final deployment at the E.L.F. OSKARI platform
- ★ Finish (technical) documentation

Thank you for your attention!

Questions?



More info:

<http://www.elfproject.eu/content/health-statistics>

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Health at a Glance: Europe 2014

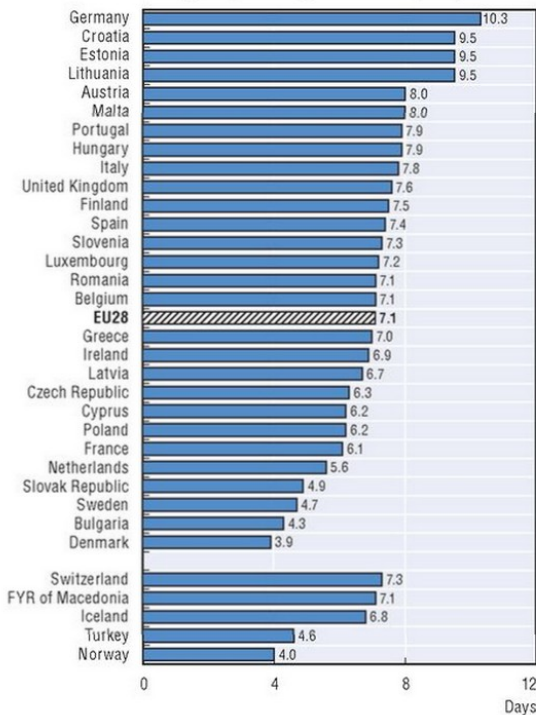


❖ Key findings

- **Life expectancy** continues to increase in the EU, reaching 79.2 years on average in 2012 (82.2 years for women and 76.1 for men) – an increase of 5.1 years since 1990. However, **inequalities** persist with a gap of 8.4 years between the highest and lowest Member State.
- Between 2009 and 2012 **health spending** in real terms (adjusted for inflation) decreased by 0.6% per year on average. This was due to cuts in health workforce and salaries, reductions in fees paid to health providers, lower pharmaceutical prices, and increased patient co-payments.
- Since 2000, the **number of doctors** per capita has increased in all EU countries except for France where it has remained stable. The **number of practising nurses** has also increased in all but two Member States.
- There are wide variations across EU countries in **waiting times for non-emergency surgical interventions**. While some countries have made progress in reducing waiting times over the past few years, in other countries such as Portugal and Spain, they have started to rise.
- **Patients are increasingly moving across borders** to pursue medical treatment. Both imports and exports of health care services have grown in most EU countries between 2007 and 2012. Patient mobility in Europe may see further growth as a result of the entry into force in 2013 of the [EU Directive on Cross-border healthcare](#) , which supports patients in exercising their right to cross-border healthcare and promotes co-operation between health systems.
- **Smoking rates** stand at an average of 22.8% in the EU (2012 data) – a 12% reduction since 2002.
- The EU has the highest level of **alcohol consumption** in the world - average of 10.1 litres per person. The countries with the highest level of consumption are Lithuania, Estonia and Austria, and the lowest are Italy, Sweden and Malta.
- **Overweight and obesity** is increasing in the EU. 53% of adults in the EU are now either overweight or obese. Obesity, which presents even greater health risks than being overweight currently affects one in six adults (16.7%) in the EU, an increase from one in eight a decade ago. However, there are considerable variations between countries.

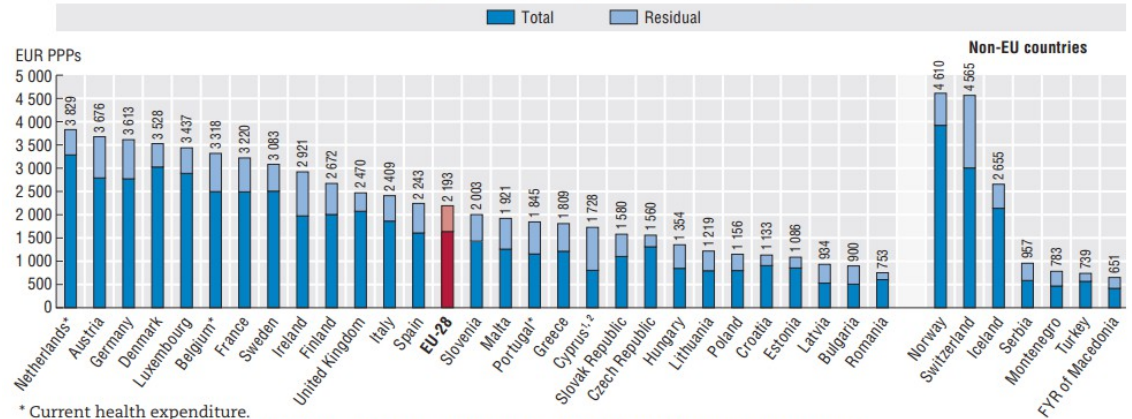
Health at a Glance: Europe 2014

3.7.3. Average length of stay for acute myocardial infarction (AMI), 2012 (or nearest year)



Source: OECD Health Statistics 2014, <http://dx.doi.org/10.1787/health-data-en>; Eurostat Statistics Database.

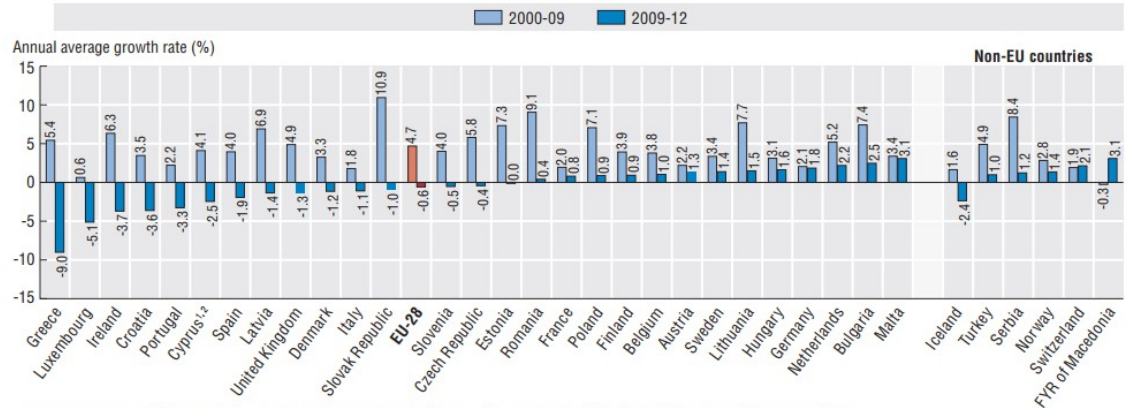
Health expenditure per capita, 2012 (or nearest year)



* Current health expenditure.

Source: OECD Health Statistics 2014; Eurostat Statistics Database; WHO Global Health Expenditure Database.

Annual average growth rate in per capita health expenditure, real terms, 2000 to 2012 (or nearest year)



Source: OECD Health Statistics 2014; Eurostat Statistics Database; WHO Global Health Expenditure Database.