

# The economic burden of epilepsy in Europe

25 MAY 2013

**Burden and Stigma of Epilepsy**  
European Forum on Epilepsy Research

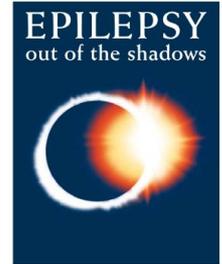
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TRINITY  
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# OUTLINE OF PRESENTATION

- Background
- Cost of Epilepsy – Methods
- Estimates of Costs in Europe
  - WHO/ILAE/IBE (2011)
  - European Brain Council (2004)
  - European Brain Council (2010)
- What influences cost estimates?
- Conclusions



# BACKGROUND

- Relatively recent area of study– 1993
  - 20<sup>th</sup> International Epilepsy Congress in Oslo
- Four phases of research areas have evolved:
  - **Cost of epilepsy** (direct, indirect, intangible costs)
  - **Cost benefit** (cost effectiveness of alternative treatments)
  - **Cost effectiveness** of structural programmes (e.g. decentralise outpatient clinics?)
  - Comparing **health care systems** (ILAE Commission on Health Care Policy)

# COST OF EPILEPSY: METHODS

- **‘Societal perspective’** approach most typical in epilepsy which examines all costs, irrespective of who incurs cost.
- Examine costs in the following areas:
  - **Direct healthcare** costs (e.g. Diagnosis, treatment)
  - **Direct non medical** (e.g. Other related goods, accommodations, may include informal care)
  - **Indirect costs** (value of lost output – employment)
  - **Intangible** (pain, etc. Valued as DALYS or lost QALYs)

# COST OF EPILEPSY: METHODS

- **Top down**
  - national level costs for disorders are divided up by disorder
- **Bottom up**
  - Cost data gathered per patient extrapolated to national level using prevalence data
  - Prevalence data typically over 12 month period

## **Total cost of epilepsy**

= cost per patient X number of patients

# ESTIMATES OF COSTS IN EUROPE

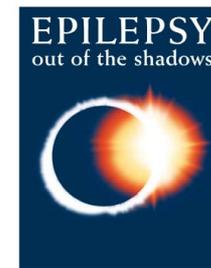
(1) **>20** billion euro/year

(2) **15.5** billion euro/year

(3) **13.8** billion euro/year

EPILEPSY IN THE WHO  
EUROPEAN REGION:

Fostering Epilepsy Care in Europe



*European Journal of Neurology* 2005, 12 (Suppl. 1): 1-27

Cost of disorders of the brain in Europe

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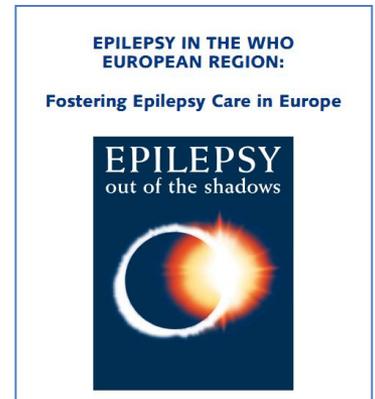


Cost of disorders of the brain in Europe 2010

Anders Gustavsson<sup>a</sup>, Mikael Svensson<sup>b</sup>, Frank Jacobi<sup>c</sup>,  
Christer Allgulander<sup>d</sup>, Jordi Alonso<sup>e</sup>, Ettore Beghi<sup>f</sup>, Richard Dodel<sup>g</sup>,  
Mattias Ekman<sup>a</sup>, Carlo Faravelli<sup>h</sup>, Laura Fratiglioni<sup>i</sup>, Brenda Gannon<sup>j</sup>,

# (1) WHO/ILAE/IBE (2011)

- Cost over €20 billion per annum
- 6,000,000 people with active epilepsy
- European Region of WHO:
  - 53 countries
  - 850 million people
- Based on prevalence estimate:
  - 8.2 per 1,000
  - From Atlas in Epilepsy (2005)
  - Expert consultation



## (2) EUROPEAN BRAIN COUNCIL (2004)

- Cost €15.5 billion per annum
- 2,690,608 people with epilepsy
- Europe defined as:
  - 25 EU Member States + Iceland, Norway, Switzerland
  - 466 million people
- Based on existing epidemiological & economic studies with median prevalence estimate of 5.2/1000

### Estimating the cost of epilepsy in Europe: A review with economic modeling

\*Maura Pugliatti, †Ettore Beghi, ‡Lars Forsgren,  
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## (2) EUROPEAN BRAIN COUNCIL (2004)

- Breakdown of €15.5 billion per annum:
- €8,554 = Indirect costs
- €4,240 = Direct non-medical costs
- €2,752 = Direct healthcare costs
  
- Average cost per person per annum:
- €5,352 (€1,329 Estonia - €9,260 Switzerland)

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Copenhagen, Copenhagen, Denmark

# (3) EUROPEAN BRAIN COUNCIL (2010)

- Cost €13.8 billion per annum ↓ (€15.5)
- 2,643,001 people with epilepsy ↓ (2.7m)
- Europe defined as:
  - 27 EU Member States + Iceland, Norway, Switzerland ↑ (2 MS)
  - 514 million people ↑ (from 466m)
- Median prevalence estimate of 5.3/1000 ↑ (from 5.2)

## (2) EUROPEAN BRAIN COUNCIL (2010)

- Breakdown of €13.8 billion per annum:
- €5,644 = Indirect costs ↓ (55%-41%)
- €1,653 = Direct non-medical costs ↓ (27%-12%)
- €6,503 = Direct healthcare costs ↑ (18%-47%)
- Average cost per person per annum:
- €5,221 (€1,291 Bulgaria-€10,246 Germany)  
↓ (€5,352)

### The economic cost of brain disorders in Europe

J. Olesen<sup>a</sup>, A. Gustavsson<sup>b,c</sup>, M. Svensson<sup>d</sup>, H.-U. Wittchen<sup>e</sup> and B. Jönsson<sup>f</sup> on behalf of the CDBE2010 study group\* and the European Brain Council

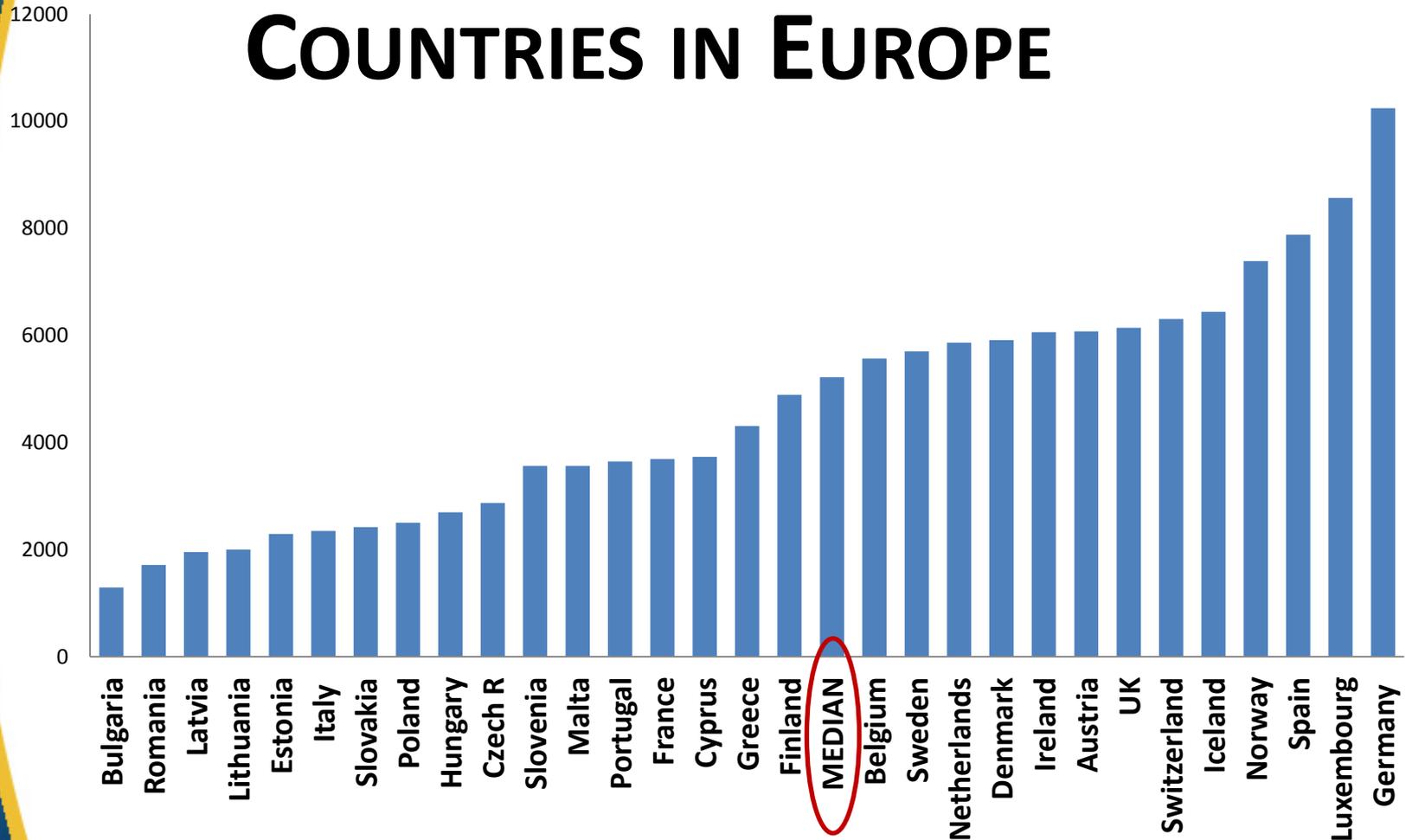
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# COST PER PERSON ACROSS 30 COUNTRIES IN EUROPE





# Countries included in EBC2010 epilepsy costings studies



# VARIATION IN 2010 COST ESTIMATES

**Table 27** Annual cost per patient with epilepsy (costs are presented in 2009 Euros).

Country	Direct health care costs	Direct non-medical costs	Indirect costs	Total costs	Year	Reference
Switzerland	5186	n.a.	2831	8017	1990	Gessner et al. (1993)
UK	689	1677	5448	7813	1990	Cockerell et al. (1994)
UK	850	n.a.	2691	3541	1991	Swingler et al. (1994)
France, Germany, UK	3104	409	2555	6068	1993	van Hout et al. (1997)
UK	1044	2375	1777	5196	1993	Jacoby et al. (1998)
France	2640	n.a.	n.a.	2640	1998	(De Zélicourt et al., 2000) – 1st year
France	695	n.a.	n.a.	695	1998	(De Zélicourt et al., 2000) – 2nd year
Italy	1579	n.a.	223	1802	1996	Berto et al. (2000)
Italy	2262	n.a.	n.a.	2262	1998	Guerrini et al. (2001)
Italy	1439	n.a.	n.a.	1439	2000	Tetto et al. (2002)
The Netherlands	3448	901	n.a.	4349	1999	Kotsopoulos et al. (2003)
Italy	1562	n.a.	n.a.	1562	2001	Beghi et al. (2004)
Germany	4493	n.a.	7161	11,654	2003	Hamer et al. (2006)
Spain	5506	282	1790	7564	2005	Sancho et al. (2008)

# SOURCES OF VARIATION

- **Age:** Prevalence and costs may be age dependent
  - some studies only include a certain age range
- **Setting:** Clinic-based or population-based?
  - Patients recruited in hospital setting tend to be high-cost cases
- **Co-morbidities** are common among people with epilepsy and have a major impact on costs.
  - Presence of comorbidity associated with 4-fold increased odds for hospitalization, 136% higher treatment costs (Lee et al., 2005)



# SOURCES OF VARIATION

- **Length of follow-up**
  - Extrapolation from studies with short follow-up will over-estimate long-term cost of epilepsy.
- **Severity and treatment response**
  - The cost per patient is strongly associated with seizure frequency and responsiveness to drug treatment
- **Cost and prevalence data should be matched, i.e. measured in same/similar populations**
  - This has seldom been the case, which may contribute to the uncertainty

# CONCLUSIONS

- **Variation in extrapolated prevalence** (2.6 – 6 million)
- **Variation in extrapolated costs** (13.8 – >20 billion)
- Large areas of Europe **unrepresented** in epidemiological and economic estimates
- **Greater accuracy** in estimates may be obtained if:
  - More country specific data
  - Epidemiological and economic data collected simultaneously
  - Greater understanding of the role of direct, direct non-medical and indirect costs