Epidemiology Literature Review
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Background

- A lot of data about chronic pain across Europe are available, but there are few pan-European sources.
- Probably the most extensive data so far come from Breivik et al. (2006).
- Another source is the Health in the European Union Report (2007).
- Furthermore, the National Health & Wellness Survey provides extensive information about pain.

On a national level there are more recent data available that can be consolidated to understand reported differences in chronic pain.
Measuring pain.....
Project Objective

 Literature review on most recent epidemiological data on chronic (moderate and severe) non-cancer pain in Germany, UK, France, Italy, Spain, Sweden, Denmark, the Netherlands, and Europe

- Data for publications *drawing attention* on severe chronic pain as an issue of public health
- Basis for common, *better understanding* on burden of disease and current treatment practice

Key Questions to be addressed

- Epidemiology flow per country
- Further questions leading to in depth knowledge of chronic pain
Methodology – Literature searches

- MEDLINE (1995 to August 2009)
- EMBASE (1995 to August 2009)
- CDSR (Cochrane Library issue 2 2009)
- CENTRAL (Cochrane Library issue 2 2009)
- DARE (August 2009, CRD website)
- HTA (August 2009, CRD website)
- Guidelines International Network database (August 2009, GIN website)

- References in retrieved articles and systematic reviews were checked. Supplementary searches were undertaken as appropriate. Search relevant websites for national statistics, insurance data, health surveys and other relevant data.
# First results of searches

<table>
<thead>
<tr>
<th>Database searched</th>
<th>Number of references retrieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medline &amp; In-Process Citations</td>
<td>7802</td>
</tr>
<tr>
<td>Embase</td>
<td>11069</td>
</tr>
<tr>
<td>Cochrane Library</td>
<td>736</td>
</tr>
<tr>
<td>Cochrane Library (including CDSR &amp; CENTRAL)</td>
<td></td>
</tr>
<tr>
<td>DARE</td>
<td>1011</td>
</tr>
<tr>
<td>HTA</td>
<td>187</td>
</tr>
<tr>
<td>GIN website</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total number of references before deduplication</strong></td>
<td><strong>20830</strong></td>
</tr>
</tbody>
</table>

| Total number of references after deduplication         | 17027                         |
Different methodology than standard review of effectiveness

- Categorize included studies to get list of relevant studies per question

- If there are more than three studies addressing a single aspect of any question, then for each question the most relevant studies will be extracted using the following criteria:
  - size (large preferred)
  - actuality (most recent preferred)
  - quality (highest quality preferred)
  - representativeness (populations representative of the general target population preferred)

- Studies will be ranked by these criteria and the 3-4 highest ranking studies were used
Detailed search results per country

Two reviewers made independently decisions about relevance based on inclusion criteria
Epidemiology flow per country - questions

What are the population and demographics of each country?

What is the prevalence of chronic pain conditions and underlying disease?

What is the incidence of chronic pain conditions and underlying disease?

How many chronic pain patients present themselves for treatment?

What percentage of chronic pain patients are untreated or inadequately treated?

How many chronic pain patients get treated broken down by treatment?

What is the compliance of treated chronic pain conditions?

What are the severity and duration of chronic pain conditions?

What are the demographics of pain sufferers?

What are the underlying diseases of pain sufferers?

What are the demographics of pain sufferers?

What are the severity and duration of chronic pain conditions?

What are the underlying diseases of pain sufferers?
Other aspects for an in-depth understanding of chronic pain and patients’ needs

Symptoms and Awareness

What are issues/determinants of patients’ awareness of chronic pain?

What are issues/determinants of health care professionals’ awareness of chronic pain?

What are the main symptoms and complaints with which patients present themselves to health care professionals?

We found multiple studies in each country, but typically the included patients were not representative of the general chronic pain population.
Other aspects for an in-depth understanding of chronic pain and patients’ needs

**Treatment**

- Frequencies of drug (per WHO class), non-drug and combined treatments?
- What are the determinants of treatment choice between drug treatment and non-drug treatment?
  - What are determinants of treatment choice within drug treatments?
  - What are determinants of compliance/adherence to drug treatments?
  - What is patients’ satisfaction about drug treatments?

*Frequencies of drug treatments and compliance reported in epidemiology flow slides – few or no data on other questions; often not representative*
Different numbers of studies were found for different questions – for some very many, for other questions very few – example UK

Q1 What are the population and demographics of each country?
   5 sources

Q2 What is the prevalence of chronic pain conditions?
   80 studies

Q3 What is the incidence of chronic pain condition?
   8 studies

Q5 How many chronic pain patients present themselves for treatment?
   22 studies

Q8 What is the disease duration of chronic pain conditions?
   35 studies

Q9 What are the demographics of pain sufferers?
   83 studies

Q10 What are the co-morbidities of pain sufferers?
   55 studies
Example: prevalence in the UK

Figure 4. General population prevalence of any (including mild pain), significant (may include mild pain), severe and moderate to severe chronic pain recorded in four UK population surveys.

- Any chronic pain (including mild pain): 41.0% (Parsons et al. 2007 - South East England population), 45.5% (Smith et al. 2001 - Grampian Scotland population)
- Significant chronic pain (Highest LEN score) (may include mild pain): 12.3% (Parsons et al. 2007)
- Severe chronic pain (CPG IV): 5.7% (Breivik et al. 2006 - UK general population)
- Moderate to severe chronic pain (≥5 on NRS): 13.0% (Breivik et al. 2006 - UK general population)
Figure 1. UK epidemiology flow for moderate to severe chronic pain, which included ~1% cancer-related chronic pain.

**Epidemiology**

1. **Prevalence**
   - Population
   - ~60 000 000 adults

2. **Diagnosis**
   - Prevalence
   - 7 800 000 (13%)
   - WHO class I – 18% took paracetamol; 23% took NSAID; 3% took Cox2 inhibitor
   - WHO class II – 50% took a weak opioid with or without paracetamol
   - WHO class III – 12% of chronic pain patients took a strong opioid

3. **Treatment choice**
   - Patient awareness
   - Disease diagnosis

4. **Brand choice**
   - No data

5. **Compliance**
   - Compliance – Pharmacy Rx fill
   - Compliance – Patient persistence
   - Good compliance in 70% of patients with severe nociceptive pain and 76% with severe neuropathic pain;
   - Good compliance in 65% of patients with moderate nociceptive pain and 60% with moderate neuropathic pain

*NB. compliance results above were from the EU NHWS 2008 survey and included those with acute and sub-acute pain*
CLOSE TO HOME

JOHN STOWN ACUPUNCTURE ASSOCIATES

“You gotta be kidding! Your back still hurts?!”
Example: prevalence in Germany

<table>
<thead>
<tr>
<th>Study</th>
<th>Pain characteristics</th>
<th>Prevalence</th>
<th>Projected to whole population (82,002,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General chronic pain</strong></td>
<td>Moderate/severe chronic pain</td>
<td>17%</td>
<td>13,940,340</td>
</tr>
<tr>
<td></td>
<td>Severe chronic pain</td>
<td>5.1%</td>
<td>4,182,102</td>
</tr>
<tr>
<td>Chrubasik et al. 1998</td>
<td>Moderate pain lasting &gt;1 year</td>
<td>25%</td>
<td>20,500,500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(22.6-27.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe pain lasting &gt;1 year</td>
<td>3.5%</td>
<td>2,870,070</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.5-4.5)</td>
<td></td>
</tr>
<tr>
<td>EU NHWS 2008 (Germany)</td>
<td>Severe pain</td>
<td>5.68%</td>
<td>4,657,714</td>
</tr>
<tr>
<td></td>
<td>Moderate pain</td>
<td>14.5%</td>
<td>11,912,157</td>
</tr>
</tbody>
</table>
**Example: epidemiology flow Germany**

### Epidemiology

1. **Prevalence**
   - Population
   - Prevalence

2. **Diagnosis**
   - Patient awareness
   - Patient presentation
   - Disease diagnosis

3. **Treatment choice**
   - Treatment choice

4. **Brand choice**
   - Brand choice

5. **Compliance**
   - Compliance – Pharmacy Rx fill
   - Compliance – Patient persistence

### Epidemiological data on:

- Population
- Prevalence

### Numbers on chronic pain:

- **Total population:** 82 002 000
- **Prevalence:** 13 940 340 (17%)

**Between 78-99% of patients present for treatment with typically persistent but variable pain, most frequent: head, face, mouth, shoulder, upper limb.**

- **Treatment:**
  - WHO class I – 2% took paracetamol; 54% NSAID; 8% Cox2 inhibitor.
  - WHO class II – 20% took a weak opioid.
  - WHO class III – 4%. Non-prescribed: 72-79% NSAID, 12% paracetamol

- **Adherence to drug treatments good or very good in 59-77% of patients**
- **Adherence varied by type of pain and treatment, pain severity, condition, current health state, fear of adverse events, number**
Example: prevalence in France

Figure 3. Prevalence of chronic pain estimated in four French population surveys

- Any chronic pain: 31.7%
- Any chronic neuropathic pain: 6.9%
- Any chronic neck and back pain: 21.3%
- Moderate to severe chronic neck and shoulder pain (workers 32-52 yrs in 1990): 10.8%
- Moderate to severe chronic pain: 15.0%
- Moderate to severe neuropathic chronic pain: 5.1%

Prevalence in French general population

References:
- Breivik et al. 2006
- Bouhassira et al. 2008
- Cassou et al. 2002
- Demyttenaere et al. 2007
Example: epidemiology flow France

**Epidemiology**

1. Prevalence
2. Diagnosis
3. Treatment choice
4. Brand choice
5. Compliance

**Epidemiological data on:**

- Population
- Prevalence
- Patient awareness
- Patient presentation
- Disease diagnosis
- Brand choice

**Numbers on moderate to severe non-cancer chronic pain:**

- ≈47,346,000 adults
- ~28,000,000 between ~25-50 years and working
- (15%) ~7,102,000 adults

**WHO class details:**

- WHO class I – 38% took paracetamol; 25% took NSAID; 5% took Cox2 inhibitor
- WHO class II – 19% took a weak opioid with or without paracetamol
- WHO class III – 4% of chronic pain patients

**Compliance details:**

- Compliance – Pharmacy Rx fill
- Compliance – Patient persistence

**Moderate and severe nociceptive pain sufferers, respectively 71% and 78% had good or complete compliance, 43% and 47% had complete compliance, and 4% and 3% had low compliance with their medical pain regimes.**

**Severe neuropathic pain sufferers, 45% had complete compliance with their prescribed medical regime.**

**NB. above results included those with acute and sub-acute pain**
Example: epidemiology flow Netherlands
Example: epidemiology flow Italy

1. Prevalence
   - Population
     - Prevalence
   - Patient awareness
   - Patient presentation
   - Disease diagnosis

2. Diagnosis
   - Treatment choice

3. Treatment choice
   - Treatment choice
   - Brand choice
     - No data

4. Brand choice
   - Compliance – Pharmacy Rx fill
   - Compliance – Patient persistence

5. Compliance

Numbers on chronic pain:
- 60,045,000 total population
- 15,600,000 (26%)

Overall musculoskeletal prevalence 27% of which: osteoarthritis 9%, soft tissue disorders, 9%, low back pain 6%, inflammatory rheumatic diseases 3%

WHO class I – 6% took paracetamol; 68% took NSAID; 7% took Cox2 inhibitor
WHO class II – 9% took a weak opioid with or without paracetamol
WHO class III – not reported

Good compliance in 56% of patients with severe nociceptive pain and 77% with severe neuropathic pain;
Good compliance in 50% of patients with moderate nociceptive pain and 56% with moderate neuropathic pain

NB. compliance results above were from the EU NHWS 2008 survey and included those with acute and sub-acute pain
Example: epidemiology flow Spain
Further questions leading to in depth knowledge of chronic pain

What is the impact of chronic pain?
- Quality of life
- Activities of daily living
- Depression and other mental illness
- Isolation, helplessness
- Days off work

What are the costs of chronic pain from different perspectives?
- Patient perspective?
- Societal perspective?
- Health care system perspective?
Different numbers of studies were found for different questions – for some very many, for other questions very few – Example UK

Figure 3c. What are the costs of chronic pain from different perspectives – number of studies located per question

Q13c Patient perspective? 1 study
Q13a Societal perspective? 2 studies
Q13b Health care system perspective? 3 studies
Two separate cohorts of patients were defined from the MediPlus GP database, in order to characterise the workload impact of both established and new patients being treated with anti-inflammatory / analgesic agents.

Extrapolating these results to a national level suggests that management of therapy in these patients accounts for 4.6 million appointments per year:

- equivalent to 793 whole time GPs
- total cost of around £69 million

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Primary care workload in the management of chronic pain. A retrospective cohort study using a GP database to identify resource implications for UK primary care

Jonathan Belsey"
Example: costs of chronic pain in Germany

Figure 29. Mean cost (€) by pain grade in adults with persistent back pain (n=1718) (Schmidt et al. 2009)

- Pain grade 1 (n=625):
  - Direct: 320
  - Indirect: 383

- Pain grade 2 (n=571):
  - Direct: 842
  - Indirect: 1614

- Pain grade 3 (n=522):
  - Direct: 1865
  - Indirect: 2277
Example: costs of chronic pain in France

Figure 22. Total annual costs due to rheumatoid arthritis per patient from a) public payer and b) societal perspective (Kobelt et al. 2008)

Fig. 22a. Public payer perspective

- Direct medical costs: €2305
- Direct non-medical costs: €9216
- Indirect costs: €136

Fig. 22b. Societal perspective

- Direct medical costs: €5076
- Direct non-medical costs: €4857
- Indirect costs: €11757
Example: costs of chronic pain in Italy

Table 28: Total mean cost of pain treatment over a 2 month period of patients suffering general chronic pain recruited from general practice in Italy (Garattini et al. 2004)

<table>
<thead>
<tr>
<th></th>
<th>Mean cost/patient (€) over 2 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs</td>
<td>16.20</td>
</tr>
<tr>
<td>Physical therapy</td>
<td>10.88</td>
</tr>
<tr>
<td>Diagnostic tests</td>
<td></td>
</tr>
<tr>
<td>Laboratory tests</td>
<td>0.41</td>
</tr>
<tr>
<td>Paraclinical tests</td>
<td>18.24</td>
</tr>
<tr>
<td>Specialist visits</td>
<td>5.86</td>
</tr>
<tr>
<td>Hospital recovery</td>
<td>29.24</td>
</tr>
<tr>
<td>Total</td>
<td>€80.87</td>
</tr>
</tbody>
</table>
Example: costs of chronic pain in Spain

- Percentage of patients with severe pain who had visited a physician for their pain ranged from 58.8% (patients with hand OA) to 75.9% (patients with FM) (Carmona et al 2001)
- The estimated cost of a visit to a GP was 80 Euros (Nunez et al. 2007)
- The costs of technical procedures involved in treating their pain ranged from 2.52 Euros for blood tests to 27.35 Euros for an MRI scan
- The mean annual direct ambulatory cost for patients with FM was 909 Euros (Sicras-Mainer 2009)
- For neuropathic pain the direct monthly total costs to the health care system was between 344 Euros and 376 Euros (Rodriguez 2007)

- These studies focused on specific pain conditions, and it is not possible to estimate the total costs to healthcare of chronic pain or other chronic pain conditions
Conclusions

- There is a tremendous amount of information about chronic pain in Europe, and the vast majority comes from the specific countries.

- Prevalence of chronic pain is high (12-26%).

- Mean annual costs per annum per chronic pain patient are typically several thousands euros, increasing to low 5-figure sums from societal perspectives.

- A lot of data/studies exist, but far fewer studies addressed a representative general chronic pain population, so some care in interpretation is warranted.
Output and next steps: separate reports for each country and for Europe as a whole

- Reports of 150-250 pages for each country

- Possible country specific publications (options still open)
  - Powerpoint presentations
  - Journal articles
  - Books

- Pan-European report