Medical Spending on the Danish Elderly

Bent Jesper Christensen*, Mette Gørtz** and Malene Kallestrup-Lamb*

*CREATES, Department of Economics, Aarhus University. **Department of Economics, Copenhagen University.

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Organised by Eric French (IFS and UCL) and Elaine Kelly (IFS)

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Motivation

The Danish health care system differs significantly from the U.S. however more similar to the UK.

Health care in Denmark is universal, free of charge and high quality.

Everybody is covered as a right of citizenship.
  
  No issue of private insurance, eligibility only by age 65, etc.

The Danish health care system is popular, with patient satisfaction much higher than in many other developed countries.

Interestingly, despite their universal coverage, the Danish health care system is far more cost-effective than the US.
  
  11 % vs 18% of GDP.
Outline

- The Danish Health Care System
- Overview of Data
- Results
Financing Health Care

- Health care is financed predominantly by public means, funded by a pay-as-you-go scheme, where government expenditures are financed through income taxes.
  - The government provides almost all hospital services (98%).
- From 1995 to 2012 the general government expenditure on health as percentage of total health care expenditures has risen from 82% to 86%.
  - This implies that private spending, out-of-pocket expenditures, have fallen from 18% to 14% in this period.
- Moreover, total health care expenditures as percentage of GDP has risen from 8% to 11% within the same period.
Financing Health Care

As of 2007, the country consists of five regions with 98 municipalities.

- The regions are responsible for running the public hospitals.
- They receive both a general subsidy and an activity based subsidy from the state, in total around 82% of their expenditures.
- The municipalities also contribute to the regional expenditures by around 18%.
- Additional funding is by means of loans and pools.
The salaries for physicians (MD) in the public hospitals and the general practitioner (GP) differ.

- MDs are publicly employed and their salary is determined in part by the length of service (seniority) and personal qualifications.
  - Basic salaries are negotiated by the relevant labour market parties in a collective agreement.
- GPs are self-employed but has an obligation to provide health care services to citizens.
  - Almost all services are fully paid for by the government.
  - Some services (very few) are paid for by the patient - e.g. holiday vaccinations, flu shots, HPV vaccination
Rationalizing Health Care

At least two concepts are in play to rationalize health care services:

1. The gatekeeper function of the general practitioner.

   - Citizens are limited in selecting health care providers
     - The primary access to health care services is through the general practitioner.
   
   - Apart from acute needs, hospitalization and specialized treatment is always referred by the general practitioner.
Rationalizing Health Care

2. The attribute of GPs/MDs dispensing (single dimension classification).

- Over-the-counter drugs are very limited in supply.
  - Moreover prescription drugs also rationalize the use of drugs in itself.
- The pharmaceutical market is highly regulated
  - Within certain period intervals (14 days) pharmaceutical companies submit prices for their product to the central health authority, which publishes the list of prices of drugs sold at the pharmacies.
  - Pharmacies have monopoly for selling prescription drugs in Denmark.
- The GP or physician prescribes the drug, yet has no real influence on the specific brand.
Rationalizing Health Care

- When the drug is dispensed at the pharmacy, it is by law required that the less expensive alternative is offered the patient.
  - The patient may opt for the most expensive.
- Subsidies are given for drugs on an annual basis, covering up to 100% of the expenses when exceeding a certain threshold.
- For adults (in 2015 prices):
  - From USD less than 155; 0%.
  - From USD 155 – 250; 50%.
  - From USD 250 – 545; 75%.
  - From USD above 545; 85%.
  - Can apply for 100% subsidy above this level.
We use yearly register data directly from Statistics Denmark for the entire population for the time period 1980 – 2014.

As everybody in Denmark has a central personal register number, CPR, we are able to uniquely identify each person in all areas of the public register system with respect to areas such as

- Demographics, labour market status, financial Indicators, and health.

As the Danish health care system is financed predominantly by the government (limited out-of-pocket expenditures) we use the following data to assess the governments total cost of health care for all individuals in the population.

- The Hospital Register
- The Health Insurance Register
- The Medicine Register
Data - Hospital Register

- This register contains daily data from 1980 – 2014 regarding all hospital admissions of both somatic and psychiatric patients.
  - Includes both inpatients and outpatients from 1994.
- In particular, the register contains information about
  - Some demographics on the patient (age, gender, region, etc.).
  - Specific patient data:
    - Date for admission and discharge.
    - Type of diagnosis - both main condition and possibly several additional conditions - classified according to WHO’s international classification of diseases (ICD-8/10).
    - Type of treatment and performed operations.
    - Time and cause of death.
  - Hospital data (type, department, and location).
  - From 2007: Calculated cost for each treatment performed (based on DRG (Diagnosis Related Groups) and DAGS (Danish Outpatient Grouping System)).
This register contains daily data from 1990 – 2014 regarding services provided by general practitioners, specialist doctors, dentists, physiotherapists, chiropractors, and psychologists.

Only those subsidied by the national health insurance.

In particular, the register contains information about

- Some demographics on the individual with whom the service was provided (age, gender, region, etc.).
- The provider of the service (area of specialty, region, etc.).
- The service (type of service, date, size of subsidy from the government, etc.).
The Medicine Register (Still awaiting approval)

- This register contains daily data from 1994 – 2014 regarding all medicine sold by pharmacies in Denmark.
  - From 1997 and onwards also medicine sold and used by Danish hospitals.

- The register contains:
  - Detailed data on prescription drugs (prescribing GP, price, subsidies, etc.).
  - Some information regarding over-the-counter drugs.
  - No information on herbal medicine.
Next step: Merge all health data to the general register data which include information for all individuals in the population.

- Demographics: Age, gender, marital status, geographical location, level of education.
- Labour market status: Working full time, unemployment rate, experience, membership of UI-fund, sickness pay, type of occupation, sector specific variables.
- Financial Indicators: Own income, family income, wealth, pension savings.
- All information is also available for the spouse. Can link to family members (children, spouses, parents) and analyze intergenerational issues.
Results

- Focused on age distribution and distribution across population.
- Note: We do not at present have data on elder care and home care.
  - They are of relatively high quality in Denmark.
  - We will get data at the aggregate level, and possibly also from registers.
- Thus, our expenditures may seem low compared e.g. to the U.S.
Results

Age distribution 2007-2014
Results - Health Cost

- Estimated medicine costs two billions USD per year
- Fixed costs for buildings and equipment for hospitals not included
- Private health costs (dentists etc.) and nursing homes not included

<table>
<thead>
<tr>
<th>Year</th>
<th>Primary health sector</th>
<th>Hospital sector</th>
<th>Medication</th>
<th>Total spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1,741</td>
<td>7,938</td>
<td>-</td>
<td>9,679</td>
</tr>
<tr>
<td>2008</td>
<td>1,959</td>
<td>8,384</td>
<td>-</td>
<td>10,343</td>
</tr>
<tr>
<td>2009</td>
<td>1,949</td>
<td>8,868</td>
<td>-</td>
<td>10,187</td>
</tr>
<tr>
<td>2010</td>
<td>1,873</td>
<td>9,237</td>
<td>-</td>
<td>11,111</td>
</tr>
<tr>
<td>2011</td>
<td>1,970</td>
<td>9,713</td>
<td>-</td>
<td>11,684</td>
</tr>
<tr>
<td>2012</td>
<td>1,793</td>
<td>8,540</td>
<td>-</td>
<td>10,334</td>
</tr>
<tr>
<td>2013</td>
<td>1,799</td>
<td>9,419</td>
<td>-</td>
<td>11,217</td>
</tr>
<tr>
<td>2014</td>
<td>9,177</td>
<td>-</td>
<td>-</td>
<td>10,199</td>
</tr>
</tbody>
</table>
## Results - Health Cost

<table>
<thead>
<tr>
<th>Spending percentile</th>
<th>Percentage of enrollees</th>
<th>Percentage of total spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everyone</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>95-100%</td>
<td>5%</td>
<td>47%</td>
</tr>
<tr>
<td>90-95%</td>
<td>5%</td>
<td>32%</td>
</tr>
<tr>
<td>70-90%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>50-70%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>0-50%</td>
<td>50%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Results

![Graph showing medical spending by age for men and women in Denmark. The Y-axis represents spending in a monetary unit, and the X-axis represents age. The graph highlights a peak in spending for both men and women around the age of 70.](image)
Results - Health Cost Before Death

- As we are currently limited to 2007-2014 for cost data for health we can only assess health care costs before death from 2010 and onwards.
- We are still awaiting death data for 2013-2014.

<table>
<thead>
<tr>
<th></th>
<th>Total Population</th>
<th>Healthcare Population</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Total</td>
</tr>
<tr>
<td>2010</td>
<td>26,762</td>
<td>27,606</td>
<td>54,368</td>
</tr>
<tr>
<td>2011</td>
<td>25,939</td>
<td>26,577</td>
<td>52,516</td>
</tr>
<tr>
<td>2012</td>
<td>25,911</td>
<td>26,414</td>
<td>52,325</td>
</tr>
</tbody>
</table>

- 64 – 66% of males and 67 – 68% females experience health cost prior to death.
## Results - Health Cost Before Death

<table>
<thead>
<tr>
<th>USD, 2005 price level</th>
<th>Healthcare Population Mean</th>
<th>65+ Healthcare Population Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>3rd to last</td>
<td>9,496</td>
<td>8,370</td>
</tr>
<tr>
<td>2nd to last</td>
<td>16,202</td>
<td>13,524</td>
</tr>
<tr>
<td>Year of Death</td>
<td>25,601</td>
<td>19,956</td>
</tr>
<tr>
<td>Sum of last 3 years</td>
<td>51,298</td>
<td>41,850</td>
</tr>
</tbody>
</table>

Christensen, Gørtz & Kallestrup-Lamb (2003/15) - Medical Spending - Denmark
Conclusion

- Looking at a different health care system than e.g. the U.S.
- Population registers.
- Very recently had data up and running.
- Still waiting for some data.
- Still more work to do.
- Any comments or suggestions would be much appreciated.