Implementing health financing reforms:

*DRG-based hospital payments in Germany*

Dipl.-Ing. Alexander Geissler
Research Fellow
Department of Health Care Management
Berlin University of Technology
WHO Collaborating Centre for Health Systems, Research and Management
European Observatory on Health Systems and Policies
1) German hospital landscape

2) The G-DRG system

3) System evaluation

4) Future trends and challenges
## Hospital facts (Data year 2007)

<table>
<thead>
<tr>
<th>Size and type of ownership</th>
<th>Hospitals overall</th>
<th>Beds</th>
<th>Beds per 100 000 inhabitants</th>
<th>Occupancy</th>
<th>Cases</th>
<th>Cases per 100 000 inhabitants</th>
<th>ALOS*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (Share in %)</td>
<td>Number (Share in %)</td>
<td>Number</td>
<td>[%]</td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td>Hospital size in bed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 49</td>
<td>2 087 (100)</td>
<td>506 954 (100)</td>
<td>616</td>
<td>77.2</td>
<td>17 178 573</td>
<td>20 883</td>
<td>8.3</td>
</tr>
<tr>
<td>50 - 99</td>
<td>407</td>
<td>7 372</td>
<td>9</td>
<td>64.9</td>
<td>210 028</td>
<td>235</td>
<td>8.5</td>
</tr>
<tr>
<td>100 - 149</td>
<td>264</td>
<td>19 354</td>
<td>24</td>
<td>73.3</td>
<td>529 579</td>
<td>644</td>
<td>9.8</td>
</tr>
<tr>
<td>150 - 199</td>
<td>302</td>
<td>36 995</td>
<td>45</td>
<td>74.2</td>
<td>1 108 285</td>
<td>1 347</td>
<td>9.0</td>
</tr>
<tr>
<td>200 - 299</td>
<td>208</td>
<td>35 903</td>
<td>44</td>
<td>74.8</td>
<td>1 179 137</td>
<td>1 433</td>
<td>8.3</td>
</tr>
<tr>
<td>300 - 399</td>
<td>326</td>
<td>79 578</td>
<td>97</td>
<td>76.1</td>
<td>2 612 288</td>
<td>3 176</td>
<td>8.5</td>
</tr>
<tr>
<td>400 - 499</td>
<td>203</td>
<td>69 613</td>
<td>85</td>
<td>77.4</td>
<td>2 361 352</td>
<td>2 871</td>
<td>8.3</td>
</tr>
<tr>
<td>500 - 599</td>
<td>131</td>
<td>58 258</td>
<td>71</td>
<td>77.6</td>
<td>1 953 598</td>
<td>2 375</td>
<td>8.4</td>
</tr>
<tr>
<td>600 - 799</td>
<td>96</td>
<td>52 545</td>
<td>64</td>
<td>77.1</td>
<td>1 870 325</td>
<td>2 274</td>
<td>7.9</td>
</tr>
<tr>
<td>&gt; 800</td>
<td>64</td>
<td>43 654</td>
<td>53</td>
<td>78.8</td>
<td>1 564 800</td>
<td>1 902</td>
<td>8.0</td>
</tr>
<tr>
<td>Public hospitals</td>
<td>677 (32.4)</td>
<td>250 345 (49.4)</td>
<td>304</td>
<td>78.9</td>
<td>8 697 755</td>
<td>10 573</td>
<td>8.3</td>
</tr>
<tr>
<td>under private law</td>
<td>380</td>
<td>133 957</td>
<td>163</td>
<td>77.5</td>
<td>4 804 914</td>
<td>5 841</td>
<td>7.9</td>
</tr>
<tr>
<td>under public law</td>
<td>297</td>
<td>116 388</td>
<td>141</td>
<td>80.5</td>
<td>3 892 841</td>
<td>4 732</td>
<td>8.8</td>
</tr>
<tr>
<td>- legally dependent</td>
<td>161</td>
<td>54 319</td>
<td>66</td>
<td>79.5</td>
<td>1 755 576</td>
<td>2 134</td>
<td>9.0</td>
</tr>
<tr>
<td>- legally independent</td>
<td>136</td>
<td>62 069</td>
<td>75</td>
<td>81.4</td>
<td>2 137 266</td>
<td>2 598</td>
<td>8.6</td>
</tr>
<tr>
<td>Non-profit hospitals</td>
<td>790 (37.9)</td>
<td>177 632 (35.0)</td>
<td>216</td>
<td>75.3</td>
<td>5 970 324</td>
<td>7 258</td>
<td>8.2</td>
</tr>
<tr>
<td>Private hospitals</td>
<td>620 (29.7)</td>
<td>78 977 (15.6)</td>
<td>96</td>
<td>76.2</td>
<td>2 510 494</td>
<td>3 052</td>
<td>8.7</td>
</tr>
</tbody>
</table>
Range of activities and services in hospital sector

Pre-hospital care (GPs, Specialists)
- Referral by GP or specialist

Hospital Treatment
- Inpatient care
- Day-surgery

Post-hospital care (GPs, Specialists, Rehabilitation)
- Discharge to GP, specialist or rehabilitation

Highly specialized care on in-and outpatient basis (e.g. Cystic fibrosis)
Hospital financing and capacity planning

- Financing follows the principle of duality since Hospital Financing Act (KHG) in 1972
- Capacities are planned by the state governments on the basis of so-called “hospital requirement plans”
Infrastructure investments

- **Long-term** infrastructural assets require a case-by case grant application by each individual hospital

- Flat-rate grants for **short-term** assets (3–15 years economic life) can be granted

- In practice, infrastructural hospital investments are mainly determined by the budgetary situation of the states and by political considerations
Operating costs

- Sickness funds negotiating activity based DRG budgets every year with every “planned” Hospital

$$\text{Casemix} \times \text{Base rate} + \text{Supplementary fees} = \text{Hospital budget} + \text{Extra-budgetary payments (e.g. for innovations)}$$

- Budget over-run adjustment (hospital pays back):
  - 65% (standard DRGs), 25% (drugs, medical, polytrauma and burns DRGs), Negotiation for hardly predictable DRGs

- Budget under-run adjustment (hospital receives compensation):
  - 20% (standard DRGs)
1) German hospital landscape

2) The G-DRG system

3) System evaluation

4) Future trends and challenges
Aims of DRG introduction in Germany

- Facilitating a precise and transparent measurement of the case mix and the level of services delivered by hospitals

- Achieving a more appropriate and fair allocation of resources by utilising DRGs instead of per diem charges

- Increasing efficiency and quality of service delivery due to the improved documentation of internal processes and increased managerial capacity

- Cost containment based on LOS and bed capacity reduction
The G-DRG system

Tasks and stakeholders of the DRG system development

- Health Policy
  - Health Ministry (federal, state)
- Administration
  - Self-Administration (DKG, GKV, PKV)
  - Other Institutions (HTA, quality)
- Consultation
  - Variety of Institutions (Professional medical associations, industry groups)
- Development
  - InEK (German DRG Institute)
  - DIMDI (German Institute of Medical Information and Documentation)
The G-DRG system

DRG system building blocks

Data collection
- Demographic data
- Clinical data
- Cost data
- Sample size, regularity

Patient classification system
- Diagnoses
- Procedures
- Complexity
- Frequency of revisions

Price setting
- Cost weights
- Base rate(s)
- Prices/tariffs
- Average vs. “best”

Actual hospital payment
- Volume limits
- Outliers
- High cost cases
- Negotiations
AR-DRGs were the basis for further self development
The G-DRG system

Development over time

- Increased precision due to more cost weights
- Treatment costs were better reflected over time

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRGs total</td>
<td>664</td>
<td>824</td>
<td>878</td>
<td>954</td>
<td>1082</td>
<td>1137</td>
<td>1192</td>
<td>1200</td>
</tr>
<tr>
<td>Inpatient DRGs total</td>
<td>664</td>
<td>824</td>
<td>878</td>
<td>952</td>
<td>1077</td>
<td>1132</td>
<td>1187</td>
<td>1195</td>
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<tr>
<td>- valuated</td>
<td>642</td>
<td>806</td>
<td>845</td>
<td>912</td>
<td>1035</td>
<td>1089</td>
<td>1146</td>
<td>1154</td>
</tr>
<tr>
<td>- unvaluated</td>
<td>22</td>
<td>18</td>
<td>33</td>
<td>40</td>
<td>42</td>
<td>43</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>Range of cost weights: min.-max.(rounded)</td>
<td>0.12 - 29.71</td>
<td>0.11 - 48.27</td>
<td>0.12 - 57.63</td>
<td>0.12 - 65.70</td>
<td>0.11 - 64.90</td>
<td>0.11 - 68.97</td>
<td>0.12 - 78.47</td>
<td>0.13 - 73.76</td>
</tr>
<tr>
<td>Day care DRGs total</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>- valuated</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>- unvaluated</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Supplementary fees</td>
<td>0</td>
<td>26</td>
<td>71</td>
<td>83</td>
<td>105</td>
<td>115</td>
<td>127</td>
<td>143</td>
</tr>
<tr>
<td>- valuated</td>
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<td>1</td>
<td>35</td>
<td>41</td>
<td>59</td>
<td>64</td>
<td>74</td>
<td>81</td>
</tr>
<tr>
<td>- unvaluated</td>
<td>0</td>
<td>25</td>
<td>36</td>
<td>42</td>
<td>46</td>
<td>51</td>
<td>53</td>
<td>62</td>
</tr>
</tbody>
</table>

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Data collection process

**InEK**
- Development of case fee catalogue annually
- Checking data content

**DIMDI**
- Development and update of classification base (ICD - 10 GM and OPS codes)

**Data Centre**
- Collecting datasets
- Checking case and cost data technically
- Anonymising data

**Sickness funds**
- Checking data via their medical review board
- Paying hospital

**Hospitals**
- Case data for reimbursement (§ 301 SGB V)

**Federal Statistical Office**
- Publication of data

**Checking data content**
- From every hospital (§21 KHEnG)

**Data collection**
- Demographic data
- Clinical data
- Cost data
- Sample size, regularity
Cost information for cost weight calculation

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospitals participating in cost data collection</strong></td>
<td>125</td>
<td>144</td>
<td>148</td>
<td>214</td>
<td>263</td>
<td>249</td>
<td>251</td>
<td>253</td>
</tr>
<tr>
<td>- excluded for data quality</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>38</td>
<td>28</td>
<td>33</td>
<td>28</td>
</tr>
<tr>
<td>- actual</td>
<td>116</td>
<td>144</td>
<td>148</td>
<td>214</td>
<td>225</td>
<td>221</td>
<td>218</td>
<td>225</td>
</tr>
<tr>
<td>- included university hospitals</td>
<td>0</td>
<td>12</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>- number of cases available for calculation</td>
<td>633 577</td>
<td>2 825 650</td>
<td>2 909 784</td>
<td>3 531 760</td>
<td>4 239 365</td>
<td>3 900 098</td>
<td>4 377 021</td>
<td>4 539 763</td>
</tr>
<tr>
<td>- number of cases used for calculation after data checks</td>
<td>494 325</td>
<td>2 395 410</td>
<td>2 283 874</td>
<td>2 851 819</td>
<td>2 863 115</td>
<td>2 811 669</td>
<td>3 075 378</td>
<td>3 257 497</td>
</tr>
<tr>
<td>R² all cases</td>
<td>0.4556</td>
<td>0.5577</td>
<td>0.6388</td>
<td>0.6805</td>
<td>0.7072</td>
<td>0.7209</td>
<td>0.744</td>
<td>0.7443</td>
</tr>
<tr>
<td>R² inlier</td>
<td>0.6211</td>
<td>0.7022</td>
<td>0.7796</td>
<td>0.7884</td>
<td>0.8049</td>
<td>0.8166</td>
<td>0.8345</td>
<td>0.843</td>
</tr>
</tbody>
</table>
The G-DRG system

**Bottom-up microcosting**

- Common cost accounting approach in (voluntary) cost data sample participating hospitals across Germany

→ Example: DRG I03A (Hip revision or replacement with cc)
  Cost weight: 4,192

<table>
<thead>
<tr>
<th>Cost Centre Groups</th>
<th>Hospital units with beds</th>
<th>Diagnostic and treatment areas</th>
<th>Labour</th>
<th>Material</th>
<th>Infrastructure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01: Normal ward</td>
<td>654 1744 80</td>
<td>263 401</td>
<td>156 41</td>
<td>131 19</td>
<td>371 1358</td>
<td>4554</td>
</tr>
<tr>
<td>02: Intensive care unit</td>
<td>152 360 10</td>
<td>356 236</td>
<td>45 11</td>
<td>60 1</td>
<td>64 179</td>
<td>881</td>
</tr>
<tr>
<td>03: Dialysis unit</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>0</td>
</tr>
<tr>
<td>04: Operating room</td>
<td>623 **** 401</td>
<td>263 401</td>
<td>23 32</td>
<td>1282 286</td>
<td>264 360</td>
<td>3380</td>
</tr>
<tr>
<td>05: Anaesthesia</td>
<td>356 **** 236</td>
<td>356 236</td>
<td>30 2</td>
<td>85 5</td>
<td>50 112</td>
<td>875</td>
</tr>
<tr>
<td>06: Maternity room</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>****</td>
<td>0</td>
</tr>
<tr>
<td>07: Cardiac diagnostics/ therapy</td>
<td>2 **** 2</td>
<td>2 1 2</td>
<td>1 1 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08: Endoscopic diagnostics/ therapy</td>
<td>3 **** 3</td>
<td>3 1 2</td>
<td>2 2 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09: Radiology</td>
<td>46 **** 67</td>
<td>46 67</td>
<td>1 2 14 41</td>
<td>24 45</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>10: Laboratories</td>
<td>18 **** 110</td>
<td>18 110</td>
<td>6 339 75 82</td>
<td>12 50</td>
<td>694</td>
<td></td>
</tr>
<tr>
<td>11: Other diagnostic and therapeutic areas</td>
<td>36 2 271</td>
<td>36 2 271</td>
<td>1 1 14 16</td>
<td>15 111 468</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1890 2106 1180</strong></td>
<td><strong>261 424 1283 669 276</strong></td>
<td><strong>803 2219</strong></td>
<td><strong>11112</strong></td>
<td><strong>11112</strong></td>
<td></td>
</tr>
</tbody>
</table>
Cost weight calculation

- Average costs of all inlier cases in one DRG are calculated
- DRG cost weight is calculated by dividing average costs of DRG inlier cases to the reference value (i.e. average costs of all patients in Germany)
- Cost weight = \(1\) → Average costs of all patients in Germany
The G-DRG system

Payment rate

- Relative cost weight
  - Patient characteristics
    - Gender, Age, Diagnoses, Severity
  - Treatment options
    - Procedures, Technologies, Intensity

- Base rate
  - Hospital individual until 2009; Uniform statewide from 2010

- G-DRG payment

Payment example: Normal birth without cc in Berlin in 2010

Relative cost weight
0.541

Base rate Berlin
2927.5 €

Payment
1584 €
The G-DRG system

The introduction phases

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1) Phase of preparation</strong></td>
<td><strong>2) Budget-neutral phase</strong></td>
<td><strong>3) Phase of convergence to state-wide base rates</strong></td>
<td><strong>4) Discussion on Policy</strong></td>
</tr>
<tr>
<td>Historical Budget (2003)</td>
<td>Hospital specific base rate</td>
<td>Hospital specific base rate</td>
<td>• Fixed or maximum prices</td>
</tr>
<tr>
<td>Transformation</td>
<td>15%</td>
<td>15%</td>
<td>• Selective or uniform negotiations</td>
</tr>
<tr>
<td>DRG-Budget (2004)</td>
<td>20%</td>
<td>20%</td>
<td>• Quality Assurance (adjustments)</td>
</tr>
</tbody>
</table>

- 20% Statewide base rate
- Dual Financing or Monistic
- Budgeting (amount of services)
Main facts

- Central role of self-governing bodies
- Data driven system with annual updates
- Detailed analysis of hospital costs
- Ten-year process of introduction
Agenda

1) German hospital landscape

2) The G-DRG system

3) System evaluation

4) Future trends and challenges
System evaluation

Official evaluations were planned ever since the G-DRG introduction but never made!

- Scientific study shows no negative impact on quality of care (Sens et al. 2009)
- Strengths and weaknesses of the G-DRG system:

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency and documentation</td>
<td>No quality adjustments for reimbursement</td>
</tr>
<tr>
<td>Compliance of hospitals</td>
<td>No reflection of different input prices</td>
</tr>
<tr>
<td>Reimbursement tool</td>
<td>Uniform accounting system but no full sample of hospitals</td>
</tr>
<tr>
<td>Precision</td>
<td>Increasing complexity with number of DRGs</td>
</tr>
</tbody>
</table>
Changes of incentives: DRG-based payment vs. per diem charge

- Patients are no longer “revenue” but “cost” centers
- Every case has a contribution margin
Options for Hospitals to avoid deficits under DRG-based payments

- Increase revenues
- Reduce costs

Revenues/Costs

DRG-type payment

Total costs

ALOS

Length of stay
DRGs have improved the cost accounting utilization and vice versa

**Cost accounting**

- Enables hospitals to detect sources of resource consumption
- Required for self developed DRG systems

<table>
<thead>
<tr>
<th>Hospital management</th>
<th>DRG system development</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Internal budget planning</td>
<td>- Precise (fair) payment rate calculation</td>
</tr>
<tr>
<td>- Benchmarking (within and across hospitals)</td>
<td>- Continuous system updates</td>
</tr>
<tr>
<td>- Monitoring of service delivery</td>
<td>- Transparency</td>
</tr>
</tbody>
</table>

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Future trends and challenges

DRG introduction was just the first step

Quality assurance (price adjustments):
- Pay for performance elements are broadly agreed as soon as quality is measurable
- Already possible but not done: not paying for non-performance, present on admission marker

Fixed or maximum prices (selective or uniform negotiations):
- In case of maximum prices sickness funds must be able to negotiate selective prices for highly specialized, elective or integrated treatment models
- This could lead to a price challenge with neglecting the quality
DRG introduction was just the first step

Dual or monistic financing of investments:
- Investment lag due to public dept
- Assumption that monistic financing would make investments easier to schedule due to investment surcharges on top of every DRG
Thank you very much for your time and attention!

All slides are available on: www.mig.tu-berlin.de