Chronic Disease Prevention & Control – Cost-effective interventions and treatments: evidence for action in Europe

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Structure of the Report „Managing Chronic Disease in Europe“ (in your folder)

**Part I**
Burden of Chronic Disease

- Epidemiologic Burden
  - Prevention and Early Detection
  - New Provider Qualifications and Settings

- Economic Burden
  - Disease Management Programmes
  - Integrated Models of Care

**Part II**
CDM Strategies

**Part III**
Dimensions of CDM

- New Pharmaceuticals and Medical Devices
- Financial Incentives
- Cooperation and Coordination
- Information and Communication Technology
- Evaluation Culture

Chapter 2 + Chapter 3
Chapter 4 – 6
Chapter 7
### Disease burden and deaths from non-communicable
diseases in the WHO European region by cause 2005

<table>
<thead>
<tr>
<th>Groups of causes</th>
<th>Disease Burden</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DALYs (x 1000)</td>
<td>Number (x 1000)</td>
</tr>
<tr>
<td><strong>Selected noncommunicable diseases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>34.421</td>
<td>5.067</td>
</tr>
<tr>
<td>Neuropsychiatric conditions</td>
<td>29.370</td>
<td>264</td>
</tr>
<tr>
<td>Cancer (malignant neoplasms)</td>
<td>17.025</td>
<td>1.855</td>
</tr>
<tr>
<td>Digestive diseases</td>
<td>7.117</td>
<td>391</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>6.835</td>
<td>420</td>
</tr>
<tr>
<td>Sense organ diseases</td>
<td>6.339</td>
<td>0</td>
</tr>
<tr>
<td>Musculoskeletal diseases</td>
<td>5.745</td>
<td>26</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>2.319</td>
<td>153</td>
</tr>
<tr>
<td>Oral conditions</td>
<td>1.018</td>
<td>0</td>
</tr>
<tr>
<td><strong>All noncommunicable diseases</strong></td>
<td>115.339</td>
<td>8.210</td>
</tr>
<tr>
<td><strong>All causes</strong></td>
<td>150.322</td>
<td>9.564</td>
</tr>
</tbody>
</table>
Deaths and burden of disease attributable to common risk factors, in absolute numbers and percentages of all deaths/DALYs, sorted by contribution to world-wide deaths (2001)

<table>
<thead>
<tr>
<th>Chronic disease risk factors</th>
<th>Low- and middle-income</th>
<th>High-income</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deaths</td>
<td>DALYs</td>
<td>Deaths</td>
</tr>
<tr>
<td><strong>High blood pressure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6,223</td>
<td>78,063</td>
<td>1,392</td>
</tr>
<tr>
<td></td>
<td>(12.9%)</td>
<td>(5.6%)</td>
<td>(17.6%)</td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3,340</td>
<td>54,019</td>
<td>1,462</td>
</tr>
<tr>
<td></td>
<td>(6.9%)</td>
<td>(3.9%)</td>
<td>(18.5%)</td>
</tr>
<tr>
<td><strong>High cholesterol</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3,038</td>
<td>42,815</td>
<td>842</td>
</tr>
<tr>
<td></td>
<td>(6.3%)</td>
<td>(3.1%)</td>
<td>(10.7%)</td>
</tr>
<tr>
<td><strong>Low fruit and vegetable intake</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2,308</td>
<td>32,836</td>
<td>333</td>
</tr>
<tr>
<td></td>
<td>(4.8%)</td>
<td>(2.4%)</td>
<td>(4.2%)</td>
</tr>
<tr>
<td><strong>Overweight and obesity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,747</td>
<td>31,515</td>
<td>614</td>
</tr>
<tr>
<td></td>
<td>(3.6%)</td>
<td>(2.3%)</td>
<td>(7.8%)</td>
</tr>
<tr>
<td><strong>Physical inactivity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,559</td>
<td>22,679</td>
<td>376</td>
</tr>
<tr>
<td></td>
<td>(3.2%)</td>
<td>(1.6%)</td>
<td>(4.8%)</td>
</tr>
</tbody>
</table>
Burden of death and disease attributable to stroke in selected countries in the WHO European region (2002) – not primarily a high-income problem!
Strategies against chronic disease: what is being done?

• Prevention and early detection: at least regarding tobacco now taken seriously, obesity recognised but not tackled comprehensively (conflict health / agricultural/ industry policy), cancer screening on the rise (e.g. mammography)

• Treatment interventions: important for cancer, HIV, dementia but well-established drugs for diabetes and hypertension (issue is to manage cost-ineffective new drugs)

-> main focus on Service provision and coordination issues
A word of warning on academics advising policymakers:

- ‘integrated care’
- ‘co-ordinated care’
- ‘collaborative care’
- ‘managed care’
- ‘disease management’
- ‘case management’
- ‘patient-centred care’
- ‘chronic (illness) care’
- ‘continuity of care’
- ‘seamless care’

“academic quagmire of definitions and concept analyses”
General practitioner
Specialist I
Specialist II
Specialist III

Provider settings combining expertise for red disease, blue disease …

Nurse practitioner

Patient A
Patient B
Patient C
Patient D

Case manager D

Integrated models of care (Chronic Care Model)

Disease Management Program RED DISEASE
Disease Management Program BLUE DISEASE
Disease Management Program GREEN DISEASE
Disease Management Program PURPLE DISEASE
New provider qualifications and settings

- Focus on developing highly-qualified nurses (no standard name yet)
- Nurse-led clinics in Sweden
- Nurse practitioners in the Netherlands
- Community matrons as case managers in England
- Nurses as extended arms of GPs in Germany
Disease management programmes: key elements

- comprehensive care: multidisciplinary care for entire disease cycle
- care continuum, i.e. coordination of the different components
- population orientation (defined by a specific condition)
- active client-patient management tools (health education, empowerment, self-care)
- evidence-based guidelines, protocols, care pathways
- information technology
- continuous quality improvement
DMPs are popular – at least in Germany, where they were tied to financial incentives until 2008

<table>
<thead>
<tr>
<th>DMP</th>
<th>Number of patients enrolled in DMP 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes mellitus type 2</td>
<td>2.7 mn</td>
</tr>
<tr>
<td>Diabetes mellitus type 1</td>
<td>0.1 mn</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>1.2 mn</td>
</tr>
<tr>
<td>Asthma</td>
<td>0.3 mn</td>
</tr>
<tr>
<td>COPD</td>
<td>0.3 mn</td>
</tr>
<tr>
<td>Breast cancer</td>
<td>0.1 mn</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4.7 mn (7% of SHI-insured)</strong></td>
</tr>
</tbody>
</table>
Strategies against chronic disease: how effective?

• Crucial and weak point!
• Most publications report on relatively small-scale interventions without control or inadequate control (e.g. no randomization, no risk adjustment)
• (As for pharmaceuticals etc.:) the weaker the study design, the larger the published effects
• Logic of Evidence-based Medicine applies: best available evidence counts
## Effects of anti-smoking measures on smoker prevalence

<table>
<thead>
<tr>
<th>Measure</th>
<th>Effect on smoker prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price increase by 10 percent</td>
<td>Decline by 4 percentage points in countries with high per capita income</td>
</tr>
<tr>
<td>Ban on smoking at work</td>
<td>Decline by 5-10 percentage points</td>
</tr>
<tr>
<td>Bans on smoking in pubs, restaurants and other places</td>
<td>Decline by 2-4 percentage points</td>
</tr>
<tr>
<td>Advertising ban</td>
<td>Decline by 6 percentage points if ban is absolute</td>
</tr>
<tr>
<td>Health warning on cigarette packs</td>
<td>In the Netherlands, 28 percent of all 13- to 18-year-olds said they smoked less as a result of the health warnings; in Belgium, 8 percent of those asked said they smoked less because of warnings.</td>
</tr>
<tr>
<td>Media campaigns</td>
<td>Percentage of smokers declines by 5-10 percentage points, depending on how the campaigns are targeted at specific groups</td>
</tr>
<tr>
<td>Withdrawal measures; subsidies for treatment</td>
<td>Decline by 1-2 percentage points after 2 years, depending on the spectrum of people registered</td>
</tr>
</tbody>
</table>

How effective are Disease Management Programmes?

<table>
<thead>
<tr>
<th>Disease</th>
<th>Clinical Processes</th>
<th>Health-related</th>
<th>Disease Control</th>
<th>Clinical Outcomes</th>
<th>Healthcare Utilization</th>
<th>Financial Outcomes</th>
<th>Patient Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF</td>
<td>Improved</td>
<td>Inconclusive evidence</td>
<td>Improved</td>
<td>Inconclusive evidence</td>
<td>Reduced hospital admission rates</td>
<td>Inconclusive evidence</td>
<td>Improved</td>
</tr>
<tr>
<td>CAD</td>
<td>Improved</td>
<td>Evidence for no effect</td>
<td>Improved</td>
<td>Evidence for no effect</td>
<td>Inconclusive evidence</td>
<td>Inconclusive evidence</td>
<td>Insufficient evidence</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Improved</td>
<td>Evidence for no effect</td>
<td>Improved</td>
<td>Insufficient evidence</td>
<td>Inconclusive evidence</td>
<td>Inconclusive evidence</td>
<td>Insufficient evidence</td>
</tr>
<tr>
<td>Asthma</td>
<td>Inconclusive evidence</td>
<td>Inconclusive evidence</td>
<td>Inconclusive evidence</td>
<td>Evidence for no effect</td>
<td>Inconclusive evidence</td>
<td>Evidence for no effect</td>
<td>Insufficient evidence</td>
</tr>
<tr>
<td>COPD</td>
<td>Insufficient evidence</td>
<td>Insufficient evidence</td>
<td>Insufficient evidence</td>
<td>Insufficient evidence</td>
<td>Insufficient evidence</td>
<td>Insufficient evidence</td>
<td>Insufficient evidence</td>
</tr>
<tr>
<td>Depression</td>
<td>Improved</td>
<td>N/A</td>
<td>Improved</td>
<td>Inconclusive evidence</td>
<td>Increased utilization</td>
<td>Increased cost</td>
<td>Improved</td>
</tr>
</tbody>
</table>

Codes: N/A: not applicable, as no relevant health-related behaviors for depression exist.

Disease-end point combinations in which disease management seems to achieve the intended result are shaded.

Source: RAND analysis using identified articles.

CHF indicates congestive heart failure; CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease.

### Summary of evidence on effectiveness of Chronic Care Model (CCM) components

<table>
<thead>
<tr>
<th>CCM component</th>
<th>Interventions shown to be effective</th>
<th>Outcome measures affected</th>
</tr>
</thead>
</table>
| **Patient self-management support** | • Patient educational sessions  
                             • Patient motivational counselling  
                             • Distribution or educational materials                                                  | • Physiological measures of disease  
                             • Patient  
                             - quality of life  
                             - health status  
                             - functional status  
                             - satisfaction with service  
                             - risk behaviour  
                             - knowledge  
                             - service use  
                             - adherence to treatment                                                            |
| **Delivery system design**   | • Multidisciplinary teams                                                                          | • Physiological measures of disease  
                             • Professionals adherence to guidelines  
                             • Patient service use                                                                    |
| **Decision support**         | • Implementation of evidence-based guidelines  
                             • Educational meetings with professionals  
                             • Distribution of educational materials among professionals                             | • Professionals adherence to guidelines  
                             • Physiological measures of disease                                                     |
| **Clinical information systems** | • Audit and feedback                                                                               | • Professionals adherence to guidelines                                                    |
| **Delivery system**          | Little published experimental evidence                                                             |                                                                                           |
| **Community resources**      | Little published experimental evidence                                                             |                                                                                           |
Strategies against chronic disease: how costly and how cost-effective?

• Even less published evidence; if costs are reported in evaluations, the methodology is usually flawed!

• On macro-economic implications, we have to rely on models and projections!

• Managing CD costs additional money (not effective for cost-containment in short run), but may be cost-effective (data missing!).
# Cost per Quality-Adjusted Life Year (QALY) saved by interventions to reduce or prevent obesity

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Target population</th>
<th>Estimated cost per QALY, US$</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planet health (a school-based intervention to improve nutrition and increase physical activity)</td>
<td>Middle-school children</td>
<td><strong>In girls, 4,305</strong></td>
<td>(Wang et al., 2003)</td>
</tr>
<tr>
<td>Orlistat (a pharmaceutical intervention)</td>
<td>Overweight and obese patients with type 2 diabetes mellitus</td>
<td>8,327</td>
<td>(Maetzel et al., 2003)</td>
</tr>
<tr>
<td>Bariatric surgery</td>
<td>Middle-aged men and women who are morbidly obese</td>
<td><strong>Women: 5,400-16,100</strong>&lt;br&gt;<strong>Men: 10,000-35,600</strong></td>
<td>(Craig &amp; Tseng, 2002)</td>
</tr>
<tr>
<td>Diet, exercise, and behaviour modification</td>
<td>Adult women</td>
<td>12,640</td>
<td>(Roux et al., 2006)</td>
</tr>
</tbody>
</table>
The evidence on the four strategies …

- Relatively good evidence on preventive “technologies” to reduce risk factors (tobacco, obesity …) – best in comprehensive approaches, which however are nowhere fully utilised; prevention also cost-effective (but may require resources in the order of curative technologies)
- Developing new professions promising but evidence limited to certain country examples
- DMPs improve processes but evidence on outcomes still to come, no cost savings but possibly cost-effective
- Integrated care (CCM): sounds necessary and promising, but hardly any solid evidence beyond some individual components
Shaping the future of managing chronic diseases in Europe

• Right mix of **financial incentives** very important (for insured/patients, payers, providers …)
• Strengthen **coordination** (in access, orientation, provision of information, continuity/coordination/communication among professionals)
• Elaborated **information and communication technologies** crucial, but agreement on international technical standards necessary
• Establish **evaluation** culture without exceptions
Financial pooler

Payer/purchaser

Regulator

Population/patients

Providers

Right mix of financial incentives

What comes to mind first

GP
Specialist
Hospital Nurse
Weaknesses of traditional ways of providers for chronic care

- Fee-for-service:
  - Ill patients usually attractive
  - Overprovision of services
  - Underreferral
  - No incentive for high quality
- Case payments:
  - Very ill patients not attractive
  - Tendency to average provision
  - Weak quality incentives
- Capitation:
  - Ill patients not attractive
  - Underprovision of services
  - Overreferral
  - Quality: bad results -> more work

* No incentives for appropriate continuity of care across providers
Examples of new payment measures

- ‘year of care’ payment for the complete service package required by individuals with chronic conditions (DK)
- Per patient bonus for physicians for acting as gatekeepers for chronic patients and for setting care protocols (F)
- bonus for DMP recruitment and documentation (D)
- 1% of overall health budget available for integrated care (D)
- bonuses for reaching structural, process and outcome targets (UK)
- ‘pay-for-performance‘ bonuses (US)
### Paying for chronic care quality in the UK:

bonus of GBP 125 per quality point up to 1050 points

<table>
<thead>
<tr>
<th>Type</th>
<th>Indicator</th>
<th>Points</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural</td>
<td>Patients are able to access a receptionist via telephone and face to face in the practice, for at least 45 hours over 5 days, Monday to Friday.</td>
<td>1.5</td>
<td>yes/no</td>
</tr>
<tr>
<td>Structural</td>
<td>The practice establish a register for patients with stroke or TIA</td>
<td>4</td>
<td>yes/no</td>
</tr>
<tr>
<td>Process</td>
<td>The percentage of patients with history of myocardial infarction who are currently treated with an ACE inhibitor.</td>
<td>7</td>
<td>25%-70%</td>
</tr>
<tr>
<td>Process</td>
<td>Patient Survey: The practice will have undertaken an approved patient survey each year</td>
<td>40</td>
<td>yes/no</td>
</tr>
<tr>
<td>Outcome</td>
<td>The percentage of patients with diabetes in whom the last blood pressure is 145/85 or less.</td>
<td>17</td>
<td>25%-55%</td>
</tr>
<tr>
<td>Outcome</td>
<td>The percentage of patients age 16 and over on drug treatment for epilepsy who have been convulsion-free for last 12 months recorded in last 15 months</td>
<td>6</td>
<td>25%-70%</td>
</tr>
</tbody>
</table>
New GP contract
Paying for chronic care quality in the UK

- Practices reached 91% of all points in first year, 96% in the second year
- for an average bonus of GBP >100,000/year (= > 1 billion for the NHS)!
- i.e. documented “quality“ went up, e.g. 100,000 persons were newly diagnosed with diabetes: prevalence from 3.3 to 3.6%
- Younger, middle-class patients more popular with GPs -> access problem
An extended framework

(Re-)Allocation

Financial pooler → Payer/ purchaser

Resource generation: taxes, contributions, premiums

Financing of chronic care/ DM

Population/patients

Cost-sharing & direct payments

Provider payment/reimbursement

GP, Specialist, Nurse Providers

A

B

C

D
Insurers need the right financial incentives, too: the well-known 20/80 distribution (better: 5/50 or 10/70 problem)
Chronic patients‘ cost-snaring – traditional approaches

• no co-payments for services related to their disease, e.g. ‘ALD’ (30 mainly chronic diseases) in France

• lower annual limits on co-payments

• certain drugs require lower cost-sharing if the indication is deemed serious
Chronic patients‘ cost-sharing – newer approaches

- ‘ALD’ exemption only if care protocol is established for each patient by their GP and signed by patient (France since 2004)
- Cost-sharing may be reduced or waived if patients enrol in DMPs
- Patients with chronic conditions/complex needs managed via a care plan/inscribed in DMP receive rebates (Australia) or additional services (Germany)
- ‘ALD’ exemption only if protocol is presented to every treating physician at each visit (France)
- Lower cost-sharing limit applies only if patient is compliant (Germany from 2007)
Structural barriers to coordination

• Competing operation cultures and management approaches in different sectors
• Different ownership structures
• Separate and competing providers with no incentives to cooperate
• Rivalries between professional groups
• Lack of clarity about competencies and accountability

-> Policy-makers must recognise that well-organised interests tend to benefit from fragmented care, so reforms aimed at improving coordination should be well-rewarded and supported by strong political will.
Evaluation culture

• Many aspects of managing CD are not properly evaluated -> effectiveness and cost-effectiveness of various prevention and treatment interventions not well established.

• Policy-makers are therefore not best equipped to make informed decisions.

-> Policy-makers must ensure that evaluation based on rigorous methodology is an integral part of all strategies. Existing data should be made available for research and review across different technologies, settings and providers.
Conclusions

• challenge of managing CD better is serious
• “proof“ that various strategies are effective in terms of health outcomes yet to come
  -> inbuilt evaluation important
• consideration of various strategies and dimensions important
• but: one size will not fit all -> local implementation
• Managing CD will not lead to immediate health expenditure savings but better health (if proven)
  -> economic growth -> more money available for health care
Presentation and further material at:

http://mig.tu-berlin.de

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