Belgian Medical Genomics Initiative (BeMGI): genetic testing and reimbursement in Belgium

Gert Matthijs
Center for Human Genetics, University of Leuven, Belgium

Marc Abramowicz
Hôpital Erasme, Université Libre de Bruxelles, Belgium
Overview

- Organisation of genetic services in Belgium
  - Reimbursement system

- (Rare Disease Plan)
- (Cancer)

- (Plan for the) introduction of ‘genomics’
  - Prenatal CGH arrays
  - Targeted panels, exomes

- Europe
  - Recommendations on genetic services (Council of Europe)
  - Guidelines for diagnostic NGS testing (EuroGentest)
Genetic testing in Belgium

• Public healthcare system

• 8 genetic centres (regulated by law since 1987) linked to academic hospitals (‘private-non-profit’) 4 in Flanders, 4 in Wallonia

• Specific reimbursement system for genetic tests since 1988 wonderfully simple and efficient
Genetic centres in Belgium

All (8) universities/university hospitals have a “center for human/medical genetics”.

Funded in part:
- by the regional governments “for service to the patients and public, and for research (development)”
- by the national health care system on the basis of clinical/diagnostic activities
- by research grants
Reimbursement

• Specific reimbursement system since 1988
  - Cytogenetic, molecular and biochemical tests
  - Prenatal tests

• Since 2013:
  – Stratified reimbursement of (molecular) genetic tests
  – Reimbursement for consultations (counseling)
  – Reimbursement for samples sent abroad

!!!! Accreditation (ISO 15189) of the lab is an obligation !!!!
"A.R. 22.7.1988" (en vigueur 1.8.1988)

**SECTION II. Examens génétiques.**

**Art. 33. § 1ᵉʳ.** Sont considérés comme prestations qui requièrent la qualification de médecin visé au § 2 :

Examens génétiques :

- **Caryogramme** (autres cas que ceux prévus à la prestation n° 588652 - 588663) \( € 327 \)
- Détermination de la chromatine sexuelle
- **Caryogramme sur culture de cellules amniotiques** \( € 327 \)
- Mise en culture de cellules amniotiques en vue d'un caryogramme (prestation n° 588652 - 588663) et/ou d'un dosage d'enzymes intracellulaires (prestation n° 588733 - 588744) (ne peut être portée en compte qu'une fois même si les deux prestations n°s 588652 - 588663 et 588733 - 588744 ont dû être effectuées) \( B \ 8000 \)
- Recherche d'anomalies génétiques par les méthodes d'hybridation de fragments d'A.D.N. \( € 327 \)
Reimbursement

• The unique reimbursement system has been criticized.

• € 327 ($ 444) for CF-testing?
• € 327 ($ 444) for BRCA testing!

• 2001: initiative to stratify the tests
• 2013: new regulation in place

Budget: approx. 40 M EUR in 2013 (approx. 54 M USD) for 11.099.554 inhabitants
Genetic testing – national costs - Belgium

M EUR

1996 2000 2005 2010

Matthijs-Abramowicz 2014
4 productes
per menys de 4 euros

3,90 €
Reimbursement

- Karyotype (€295), FISH (€184), CGH arrays (€579)
- DNA test: a stratified system

<table>
<thead>
<tr>
<th>Complexity</th>
<th>Test</th>
<th>Price (€)</th>
<th>Price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>Hemochromatosis</td>
<td>€ 78</td>
<td>$ 105</td>
</tr>
<tr>
<td>Frequent</td>
<td>CF, fragile X</td>
<td>€ 155</td>
<td>$ 211</td>
</tr>
<tr>
<td>Typical</td>
<td>Duchenne, MD,…</td>
<td>€ 357</td>
<td>$ 485</td>
</tr>
<tr>
<td>Complex</td>
<td>hemophilia, LDLR,</td>
<td>€ 558</td>
<td>$ 758</td>
</tr>
<tr>
<td>Very complex</td>
<td>BRCA, LQT,… + PANELS</td>
<td>€ 1,377</td>
<td>$ 1,871</td>
</tr>
</tbody>
</table>

- Prenatal test (€465)
- Biochemistry (€61 - €620)

- Patient pays only € 8,68 ($ 12)!
- No reimbursement for exomes/genomes (yet)
An exemplary system?

- All genetic centres combine clinical and laboratory activities
- Accredited diagnostic labs are closely associated with the academic research centres
- Parsimonious use of the national ‘envelope’ for testing
- Stratified system allows flexibility
- Development of national guidelines
- Recent initiative for reimbursement of exomes (genomes)
- System challenged by commercial companies
  - Disconnected from the needs (patient and population)
  - No genetic counselling
- Belgian Medical Genomics Initiative (BeMGI)
Belgian Medical Genomics Initiative

• a network funded by the Interuniversity Attraction Poles (IAP) programme of the Belgian Federal Science Policy Office (BELSPO)

• Research, standardization, education, ...
A national plan for exomes

To create the best possible framework for exome sequencing in a clinical context

Task 1: Clinical criteria for selection of cases
- HPO terms and transfer to (inter)national databases

Task 2: Clinical utility discussions and guidelines
- Health cost calculations

Task 3: Informed consent and other (ethical) issues
- Patient leaflets etc.

Task 4: Issues of medical files and data storage solved
- Guidelines for reporting

Task 5: Validation of platform, method, test and software
- Collaborative evaluation of pipeline performance

Task 6: Guidelines for variant interpretation
- Managed variants lists

Task 7: Development of a reference database
- Uploading variants and exchange of data

Task 8: Participation in international initiatives
- Link to ‘Matchmaker’ etc.
European context

Recommendation CM/Rec(2010)11 of the Committee of Ministers to member states on the impact of genetics on the organisation of health care services and training of health professionals
Guidelines for diagnostic next generation sequencing

- Diagnostic routing, diagnostic utility
- ‘Scoring system’ for gene panels and exomes
- Instructions for ‘incidental findings’
- Etc.

EuroGentest2 is a Coordination Action founded by the 7th Framework of the European Community (contract HEALTH-F4-2010-261469)
Executive Committee

Scientific Secretariat

Scientific Committees

- 1 representative per funding body
- 1 representative per group of funders (accumulative funding)
- representatives of umbrella organizations of patient advocacy groups
- the chairs of the Scientific Committees

Diagnostics

Interdisciplinary

Therapies

Working Groups

Ontologies and diseases prioritization
Sequencing
Model systems
Genome/Phenome

Ethics and Governance
Biobanks
Registries and Natural history
Bioinformatics and data sharing

Biomarkers for disease progression and therapies responses
Chemically-derived products including repurposing
Biotechnology-derived products including cell- & gene-based therapies
Orphan drug-development and regulatory processes

15 members with balanced representation of scientists, patients, industry, etc.

Representatives of funded projects or patients organisations, experts, etc.
Additional slides

Not for presentation, for information only
Molecular diagnostics in Europe

• Genetic testing laboratory affiliations

- Public hospitals: 52%
- University: 24%
- Other: 9%
- Commercial: 15%

Recommendation of the Committee of Ministers to member states.
CM/Rec (2010)11

“from specialised genetic services to genetics as an integral part of general health services”

“strengthen genetic services to maximise the benefits of genetic applications in health care for all patients”

“genetic services should incorporate clinical and laboratory facilities”
5. Primary care providers should have the necessary skills to assess the family history, recognise genetic risks, discuss with patients and relatives the implications of genetic disorders and to appropriately refer them to genetic services.

6. The recommendations set out in point 5 also apply to specialists in other fields of medicine.
Recommendation of the Committee of Ministers to member states.
CM/Rec (2010)11

“...systematic assessment of the quality, effectiveness and efficiency of genetic services.
- developing and sharing standards
- clinical practice guidelines
- clinical protocols at the European level.”
The European Union Committee of Experts on Rare Diseases is charged with aiding the European Commission with the preparation and implementation of Community activities in the field of rare diseases, in cooperation and consultation with the specialised bodies in Member States, the relevant European authorities in the fields of research and public health action and other relevant stakeholders acting in the field. Read more.
What is EuroGentest?

EuroGentest is a project funded by the European Commission to harmonize the process of genetic testing, from sampling to counseling, across Europe. The ultimate goal is to ensure that all aspects of genetic testing are of high quality thereby providing accurate and reliable results for the benefit of the patients. More...

<table>
<thead>
<tr>
<th>Workshops</th>
<th>Clinical Utility Gene Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare for accreditation or improve your current quality management system by participating in our interactive workshops.</td>
<td>Clear and concise documents with good practice information for disease specific genetic tests.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient Leaflets</th>
<th>Newsletters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Download leaflets with information on genetic testing for patients and their family in your own language.</td>
<td>Monthly highlights of news and events on quality and genetic testing.</td>
</tr>
</tbody>
</table>

For specific groups

- Genetic Laboratories
- Health Professionals
- Patients, Public & Policy
FDA awards USD 14 million to 15 rare disease projects
The U.S. Food and Drug Administration (FDA) announced it has awarded 15 grants worth more than $14 million altogether which will aim to improve the course of development of products that will be valuable to patients with rare diseases. The grant applications were reviewed by...
**Simple Search**: This screen gives access to lists of expert laboratories through a query by disease name or by gene name/symbol. You may optionally specify the country and the type of quality management (accreditation, EQA) required for the laboratory. Enter your request in the query zone, select additional desired criteria, and click on OK to validate. You may use truncated names. A list of all names matching your query will appear. Select the one of interest to you.

**Search by city**: This screen provides access to lists of expert laboratories through a query by disease name or by gene name/symbol restricted to a specific city.

**Search by laboratory**: This screen provides access to lists of expert laboratories through a query by laboratory or institution name or EUGT number, optionally restricted to a geographical area. To define the area, select a country in the drop-down list. You may also define the services that the laboratory should provide by clicking the appropriate boxes. You may also restrict your search by medical...