Comparison of prescriptions by paediatricians and general practitioners
a population-based study in Franche-Comté (France)
from the database of Regional Health Insurance Fund

Alain BOCQUET, Martin CHALUMEAU, Daniel BOLLOTTE,
Gérard ESCANO, Jacques LANGUE, Brigitte VIREY

Drs G.Danjou, F.Bovet Boone, A. Bocquet - 3rd ECPCP Congress – Strasbourg June 2012
Medical management of children’s health in Europe

- **United Kingdom**: paediatricians only in hospitals
- **Italy**: all children visited by paediatricians → 6 through 14 years (per capita)
- **Switzerland**: 90% infants visited by primary care paediatricians
- **Spain**: all children visited by paediatricians (80% in public health care centres)
- **France**:
  - mixed system,
  - children mainly visited by General Practitioners, specially for older children
What choice for medical management of children’s health in the future?

- United Kingdom:
  create an ambulatory paediatric setting in the hospitals

- USA:
  1 paediatrician for 2040 children in 2000
  1 paediatrician for 1438 children in 2020

- Italy:
  1 paediatrician for 800 children

- France:
  1 paediatrician for 5300 children
  Paediatricians average age: 52.7 years
  58% of paediatricians are more than 50 years old
  40% of paediatricians will be retired in 10 years

→ To train more paediatricians?
→ To entrust children’s care to General Practitioners?
To compare children assistance under paediatrician vs general practitioner care

- Retrospective observational cohort study
- Automated database from Regional Health Insurance Fund
- Consultations and prescriptions
- 24 months (2001 and 2002)

2 groups of children:
- only visited by general practitioners
- mainly visited by paediatricians (80% to 100%)
Franche Comté
Population in Franche Comté:
1 117 059 inhabitants
19% < 16 y : 210 007 children under 16 y

35 Primary Care Paediatricians: 1PCP / 6001 children
Patients and Medical doctors

Patients
- All the patients from 1 month through 16 years old who received in 2001-2002 at least
- 1 medical act reimbursed

Medical doctors
- All GP having treated children during this time
- PCP (35) and Paediatricians in out-patient paediatric unit in hospital (13)
Definitions

Population 1: children treated only by GP
Population 2: children treated exclusively or mainly (80 to 100 %) by PCP

Populations 1 +2 divided in 5 groups:
- 1 - 12 months
- 1 - 4 y
- 5 - 9 y
- 10 – 14 y
- 15 – 16 y
Population and methods

- 1,535,208 visits (office and home)
- 1,223 GP/48 paediatricians
- 1 month – 16 years: (1/25.5)
  - GP follow-up: 136,280 children
  - PCP follow-up: 5,495 children
- 5 y–9 y: (1/36.7)
  - GP follow-up: 43,896 children
  - PCP follow-up: 1,195 children

The data are the absolute numbers
Study of prescriptions

- **For drugs**: number of times where the same drug was prescribed in each population

- **For biology tests**: number of times where a biological test was prescribed in each population

- **For the number of hospitalisations**: children referred to hospital but not admitted have not been counted as hospitalised
RESULTS
Comparison of the number and type of medical acts per child (5-9y) and per year in populations 1 and 2

<table>
<thead>
<tr>
<th>Medical acts</th>
<th>GP group 43,896 children</th>
<th>P group 1,195 children</th>
<th>Comparison P /GPs (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children (5-9y)</td>
<td>43,896</td>
<td>1,195</td>
<td>1 / 36,73</td>
</tr>
<tr>
<td>Consultations</td>
<td>132,548</td>
<td>3,609</td>
<td>2,927</td>
</tr>
<tr>
<td>Home visits</td>
<td>14,773</td>
<td>402</td>
<td>70</td>
</tr>
<tr>
<td>Visits in %</td>
<td>10,03</td>
<td>10,03</td>
<td>2,34</td>
</tr>
<tr>
<td>Total: Consult + visits</td>
<td>147,321</td>
<td>4,011</td>
<td>2,997</td>
</tr>
<tr>
<td>Chronic diseases</td>
<td>563</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>Chronic D/ non Chronic D in %</td>
<td>0,93</td>
<td>0,93</td>
<td>1,16</td>
</tr>
<tr>
<td>Number acts/ year</td>
<td>196,428</td>
<td>5,348</td>
<td>3,996</td>
</tr>
<tr>
<td>N. acts/ child/ year</td>
<td>4,5</td>
<td>4,5</td>
<td>3,3</td>
</tr>
</tbody>
</table>

- 74.7%
To compare children assistance under paediatrician vs general practitioner care

Number of acts / children / year:
GP: 4.5
Paediatricians: 3.3
Paediatric prescriptions vs GPs, in 2001 and 2002, in children from 5 - 9 y, in Franche-Comté

<table>
<thead>
<tr>
<th></th>
<th>GPs</th>
<th>GPs 1/ 36,7</th>
<th>Pediatric.</th>
<th>Pediatric/ GPs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of children</strong></td>
<td>43896</td>
<td>1195</td>
<td>1195</td>
<td></td>
</tr>
<tr>
<td><strong>Pharmacy</strong></td>
<td>619519</td>
<td>16867</td>
<td>12576</td>
<td>74,6 %</td>
</tr>
<tr>
<td>(number of prescriptions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biology</strong></td>
<td>30816</td>
<td>839</td>
<td>700</td>
<td>83,4 %</td>
</tr>
<tr>
<td>(number of tests)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hospitalizations</strong></td>
<td>56487</td>
<td>1538</td>
<td>1446</td>
<td>94,0 %</td>
</tr>
<tr>
<td>(hospitalizations &gt; 24 h )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physiotherapy</strong></td>
<td>3037</td>
<td>83</td>
<td>91</td>
<td>109,6 %</td>
</tr>
<tr>
<td>(number of acts)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Speech therapy</strong></td>
<td>33866</td>
<td>922</td>
<td>538</td>
<td>58,3 %</td>
</tr>
<tr>
<td>(number of acts)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Drugs prescriptions

Quantitative aspects:

- The number of drug prescriptions by paediatricians is 25.4% lower
- The cost of the drug prescriptions made by paediatricians is 31.2% lower
- The number of prescriptions were related to the number of children and not to the number of acts
Drugs prescriptions

Qualitative aspects:

Antibiotics:
- penicillins (76.1%) (-24%)
- cephalosporins (26.1%) (-74%)
- macrolides (47.1%) (-53%)

Corticoids:
- oral corticoids (49.9%) (-50%)
- nasal corticoids (36.7%) (-63%)

Anti-inflammatories:
- NSAID (50.0%) (-50%)
- Anti-inflammatory enzymes (89.3%) (-10%)

Fluidifiers: 54% (-46%)

Digestive motility medications: 30.6% (-69%)

*percentages* = level of paediatricians prescriptions when that of GPs is brought back to 100
Drugs Prescriptions

Qualitative aspects:

- **Vaccines**:
  - Hepatitis B (131.1%) (+31%)
  - MMR (107.2%) (+7%)
  - Other immunizations (152.3%) (+52%)

- **Vitamin D**: (225.4%)

- **Fluoride**: (261.7%)

**percentages** = level of paediatricians prescriptions when that of GPs is brought back to 100
Laboratory prescriptions

Quantitative aspects
- The number of pediatric prescriptions is lower in 16.6%

Qualitative aspects
- GPs prescribe more tests of general biology
- Erythrocyte Sedimentation Rate (ESR): (only 12% by PCP)
- Seric iron: (only 53% by PCP)

percentages = level of pediatricians prescriptions when that of GPs is brought back to 100
Paediatricians : Main results

- Fewer acts and fewer prescriptions
- Less antibiotics, corticoids, anti-inflammatories, fluidifiers and less digestive motricity medications. (Reduction of prescriptions is not an objective by itself. Observing the guidelines → improvement of prescriptions and of quality of care, limitation of useless prescriptions → limitation of adverse side effects)
- More prevention: vaccines, vitamin D, fluoride, etc.
- Less ESR and less seric iron (probably not very helpful)
- More physiotherapy: consensus conference on «bronchiolitis», chronic diseases
- Fewer hospitalizations: more qualified care
DISCUSSION
Internal validity

- Number of refunded acts = acts registered by Health Insurance Fund
  - very close to the real number of acts (vital card, individual statement of activity and services)
  - Refunding probably identical in both groups

- Mixed care ( = pediatric acts between 0 and 80% )
  - 10.9% of the population
  - non investigated : comparison of extreme groups

- General mode of wage earning = 71% of children. Study is physician-related and not patient-related

- Acts out of this area (Franche-Comté) : 2.9%
Internal validity: sections of ages

- Visited by pediatricians = less drug prescriptions at all age sections:
  - 1 to 4 years: - 12%
  - 5 to 9 years: - 25.4%
  - 10 to 14 years: - 29%
  - 15 to 16 years: - 33%

- All population from 1 to 16 years:
  - laboratory: - 24% ( - 17%)
  - speech therapy: - 60% ( - 42%)
  - hospitalizations: - 8% ( - 6%)
  - physiotherapy: + 53% ( + 10%)
External validity

Franche-Comté: low socio economic differences with all France population
- Net taxable income = 98% of France average
- Unemployment rate: 7.4% (national average: 9%)

Health situation in Franche-Comté close to national reality
- Mortality rate: 8.9% (France: 9.0%)
- Children mortality: 4.3/1000 (France: 4.5/1000)

Pediatricians / GPs ratio: 25% (21% in France)
1 ambulatory pediatrician / 6001 children: 1 / 5300 in all France
Populations and under - populations

Two years of follow-up including not only scheduled visits but also emergencies: total assumption of care by paediatricians with various training.

Pediatricians’ competence for infants care is admitted, but more questions remain for some people related to the care of older children.

Patients visited by pediatricians are not in better health than those cared for by GPs:

- 25% more patients with chronic diseases (CD = 40% of the cost of ambulatory care, the cost of patient with CD = x 9)
- Hospitalization rate with very little differences (94%)
- More than 50% of non scheduled consultations
Conclusion

Considering medical acts and prescriptions in children in a whole area during two consecutive years, obtained from a data base provided by the « Regional Health Insurance Fund », significant differences exist in the way to assume children’s care by pediatricians vs GPs.

more investigations from different countries are needed to confirm these results.
Contacts

Dr Alain Bocquet : bocquet.a@wanadoo.fr

Dr Françoise Bovet Boone : fbovet@vision.tv

Dr Gilbert Danjou: gdanjou@wanadoo.fr