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A Disease Management Program in France : Lessons from the RESALIS Experiment 18 Months Before and 12 Months After Public Health Interventions

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REES : Réseau d 'Evaluation en Economie de la Santé
<http://www.rees-france.com>

RESALIS: A Double Bet

- Creating a sub-group of innovative health care professionals, bringing together clinicians, care workers, a health insurance fund and a pharmaceutical company.
- Demonstrating, in a pragmatic situation, that a coordinated care network for a chronic disease such as asthma reconciles improvement in quality of care and reduction in costs to the health insurance fund.

Key Facts

- Resalis was created as an association in 1998
- Support from the Eure CPAM CA and CNAMTS at the end of 1998
- Approved by the Soubie commission in December 1998
- First patients included in April 1999
- Inauguration of the breathing centre in 2000
- Support from FAQSV end of 2000
- First results published in 2001

A Network, to Do What?

- ✓ Educate
- ✓ Train
- ✓ Share
- ✓ Standardise
- ✓ Evaluate
- ✓ Remunerate
- ✓ Administer

Players in the Network

- **104 health care professionals**
 - 43 doctors, 40 pharmacists, 21 paramedical staff
- **a scientific council**
 - Respiratory physicians, experts in medical I.T., evaluation and education systems, etc.
- **an external assessor**
 - REESFrance
- **additional partners**

Evreux Hospital, the Evreux mayor's office, the Eure General Council, URCAM.

Description of the Intervention

6 HEALTH PROGRAMMES

- Computerisation of the consulting clinics
- Exchange of medical and paramedical records
- Introduction of medical guidelines
- Medical training for doctors
- Patients' educations
- Evaluation programme Continuous recording practices onto a specific database

Objectives of the Evaluation

TO DEMONSTRATE that management of patients in the context of a *Co-ordinated Care Network*[®] allows:

- MEASUREMENT of the effectiveness of treatments in **everyday practice**
- EVALUATION of the impact of a **health education programme**
- ESTIMATION of the **economic benefits** of improved management

METHOD

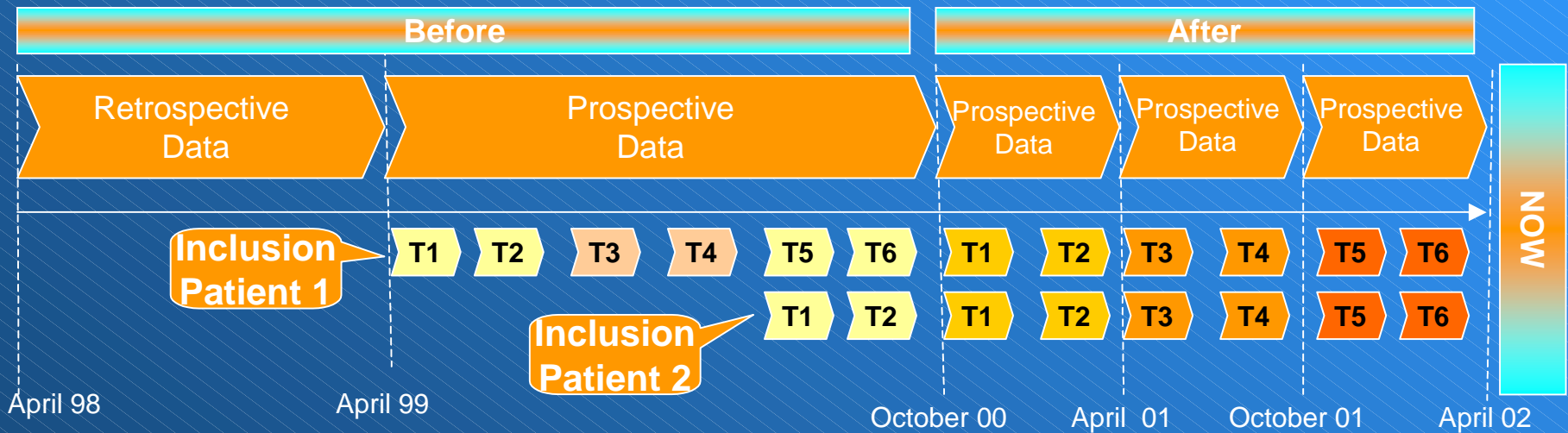
- Inclusion criteria
- Design of the study
- Information system
- Patient stratification
- Plan of the analysis

Inclusion Criteria

- Adults and children over 10 years old
- Asthmatic patients regardless of grade
- Patients who have given their informed consent and are prepared to attend the educational sessions offered.
- Patients who reside in the region of Eure and who do not intent to leave the region within a period of 18 months

Study Design

«Before-After» Comparison



T = Quarter after inclusion

Database Structure

15 files - 189 variables

Detailed analysis of Ambulatory Consultations

DATSUIVI	Date of visit (YYYYMMDD)
TYPEREC	Type of visit (medical visit, consultation, external hospital consultation, day hospital)
MAJOHONO	Fee increase (YES/NO)
MAJOURG	Emergency increase (YES/NO)
MAJONUIT	Night increase (YES/NO)
MAJODIM	Sunday increase (YES/NO)
PREXABIO	Prescription of the laboratory investigations (YES/NO)
PREDUC	Prescription of education session (YES/NO)
PRCURETH	Thermal cure (YES/NO)
CURHOSP	With hospitalisation (YES/NO)
PRSEJCLI	Climate residential stay (YES/NO)
AT	Stopped work (YES/NO)
ATTYPE	Type of stop
ATDUREE	Duration of stop (days)
ABPROFDU	Duration of absence from work (days)

Grades of Severity Defined by the General Practitioner

- *Grade 1 : intermittent asthma*
- *Grade 2 : mild persistent asthma*
- *Grade 3 : moderate persistent asthma*
- *Grade 4 : severe persistent asthma*

Level of Drug Therapy by Grade

GINA 1995

<p>Grade 1 Intermittent asthma</p>	<p>No maintenance therapy</p>
<p>Grade 2 Mild persistent asthma</p>	<p>Inhaled corticosteroids ($\leq 500 \mu\text{g}$) or Cromone or Theophylline retard. If necessary, increase corticosteroids up to 800 μg OR either Beta2 LA, inhaled or oral, or Theophylline retard</p>
<p>Grade 3 Moderate persistent asthma</p>	<p>Inhaled corticosteroids (800 – 1600 μg) AND either Beta2 LA, inhaled or oral, or Theophylline retard</p>
<p>Grade 4 Severe persistent asthma</p>	<p>Inhaled corticosteroids (1600 – 2000 μg) AND Inhaled Beta2 LA and/or oral Bêta2 LA and/or Theophylline retard</p>

Ref: GINA 1995

Plan of the Analysis

- **Clinical end point:**
 - (i) number of follow ups with control during 3 months
 - (ii) median time to no control
- **Financial end point:**
 - (i) mean cost of 3 month follow up with control and without control
 - (ii) mean cost of a 3 month follow up, all combined
- **Economic end point:**
incremental cost-effectiveness ratio of usual care 3 month follow up and follow up by the network

Clinical End Point Control of the Asthma

Composite criteria based on the criteria of the Canadian consensus*:

- **Day-time symptoms**
- **Night-time symptoms**
- **Exacerbations of the asthma**
- **Loss of work and absence from school**
- **Consumption of Beta2 mimetic agents CA**
- **Peak Expiratory Flow Rate**

* Boulet et al.:CMAJ 1999.10: S1-S9

Thresholds for Non-Control

Criteria	Canadian Consensus
Day-time symptoms	> 6d /7 d
B ₂ SA	> 6d /7 d
Night-time symptoms	> 1 night/week
FEV1	< 80 %
Exacerbations	1 since the last consultation or causing the consultation on the day
Loss of work	Yes

Quarterly Evaluation of Control

- **State of control/non control was assess for each of the consultations**
- **The number of consultations with control and without control was counted by quarter**
- **If the number of non controlled consultations was $>$ than the number of controlled consultations during a quarter \Rightarrow patient is not controlled for the trimester**

Treatment of Missing Data

- If one or more of the 6 criteria characterising control is not documented,
- Without one of the thresholds being breached when the other items are completed,
- Then, the patient is assumed to be controlled.

Financial End Point

Community perspective

Direct costs:

**hospitalisation, medical consultations,
paraclinical investigations, medicinal products**

Indirect costs:

losses of production

Economic End Point

Ranking usual care or network management according to the efficiency of follow up over a period of 3 months

$$\frac{\Delta C}{\Delta E} = \frac{C_{AI} - C_{W/O}}{E_{AI} - E_{W/O}}$$

- C_{AI} : Cost of management after intervention
- $C_{W/O}$: Cost of management without intervention
- E : Number of quarterly follow ups with control
- Δ : Incremental cost effectiveness

RESULTS

- **Population**
- **Clinical impact**
- **Financial impact**
- **Economic impact**

POPULATION

Patient Inclusion and Follow Up

On site study: 1st April 1999 – 24 April 2002

- *Before Phase*

43 Participating doctors

34 Doctors downloaded information

338 Patients included

311 Eligible patients

119 Patients only had 1 inclusion visit before intervention

192 Patients had at least 2 consultations before intervention

- *After Phase*

115 Patients followed up for 12 months after intervention

Description of the Population

n = 311

- 160 men and 150 women, no details on 1
- Mean age 44.4 years \pm 2.4 years
 - 10-25 years old : 20.26 %
 - > 60 years old : 30.72 %
- 19% long term sick for chronic respiratory failure (CREDES : 6%), half over 60 years old
- Median length of history of the disease: 14.5 years
- Smokers 20% (= CREDES)
- 1/3 of patients had allergic asthma (according to GP)

Continuous Data Management

- *1st April 1999 : start of the “before phase”*
 - 1st analysis : November 1999 (n = 114)
 - 2nd analysis : January 2000 (n = 171)
 - 3rd analysis : July 2000 (n = 275)
 - 4th analysis : January 2001 (n = 311)
- *24 October 2001 : start of the “after phase”*
 - 1st analysis : July 2001 (n = 115)
 - 2nd analysis : January 2002 (n = 115)

CLINICAL IMPACT

Percentages of Controlled Patients in the 1st Quarter Before Intervention and in the 1st Quarter After

1st quarter after \ 1st quarter before	Number of patients with controlled asthma	Number of patients with non controlled asthma	Total
Number of patients with controlled asthma	20	5	25
Number of patients with non controlled asthma	14	16	30
Total	34	21	55

controlled before: 45 %

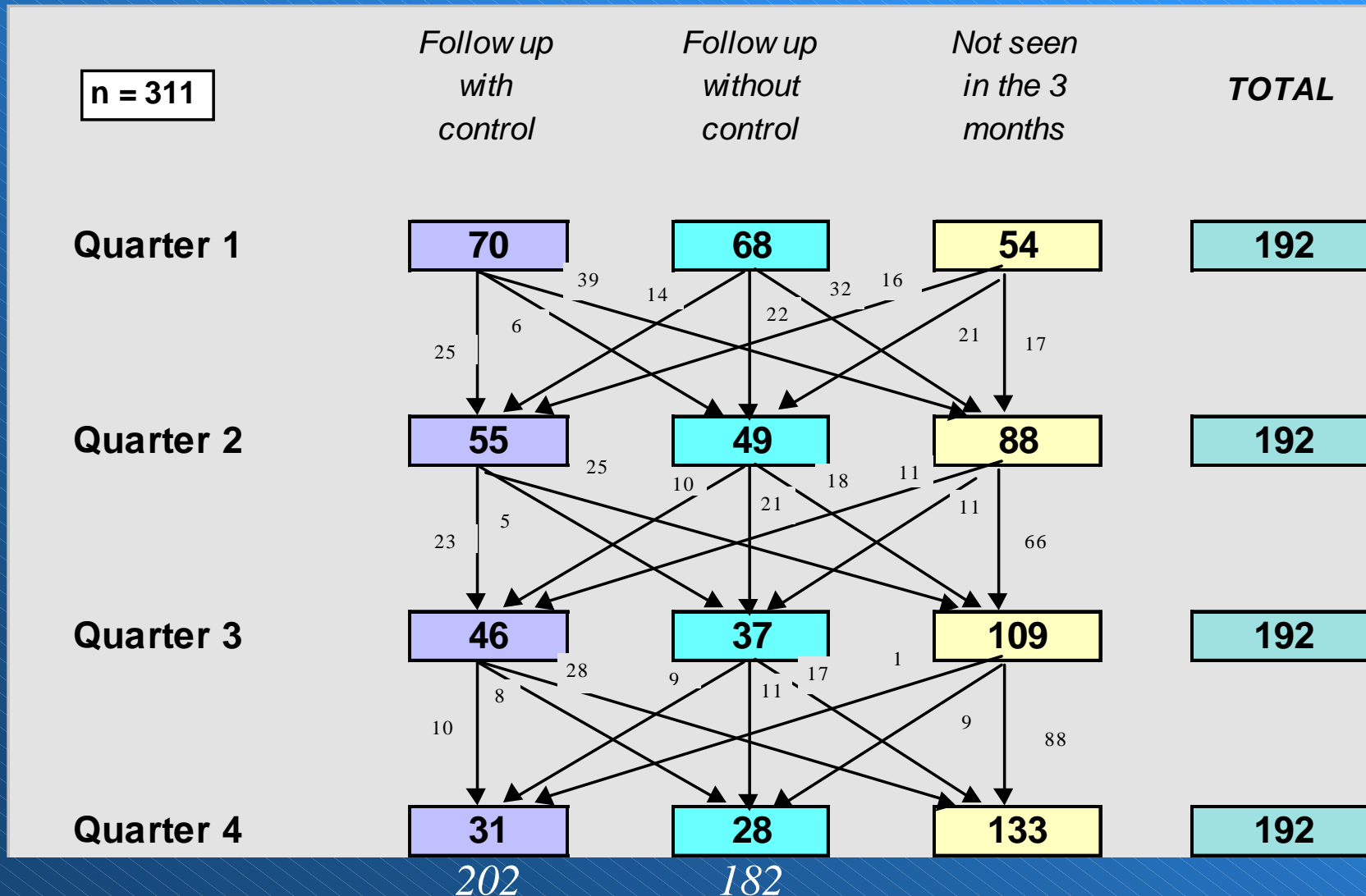
controlled after: 62 %

$P = 0.04$

(McNemar test, paired samples)

Outcome of Asthmatic Patients 12 Months Follow Up Before Intervention

192 PATIENTS



Control and Non Control of Patients

Follow Up for 12 months Before Intervention

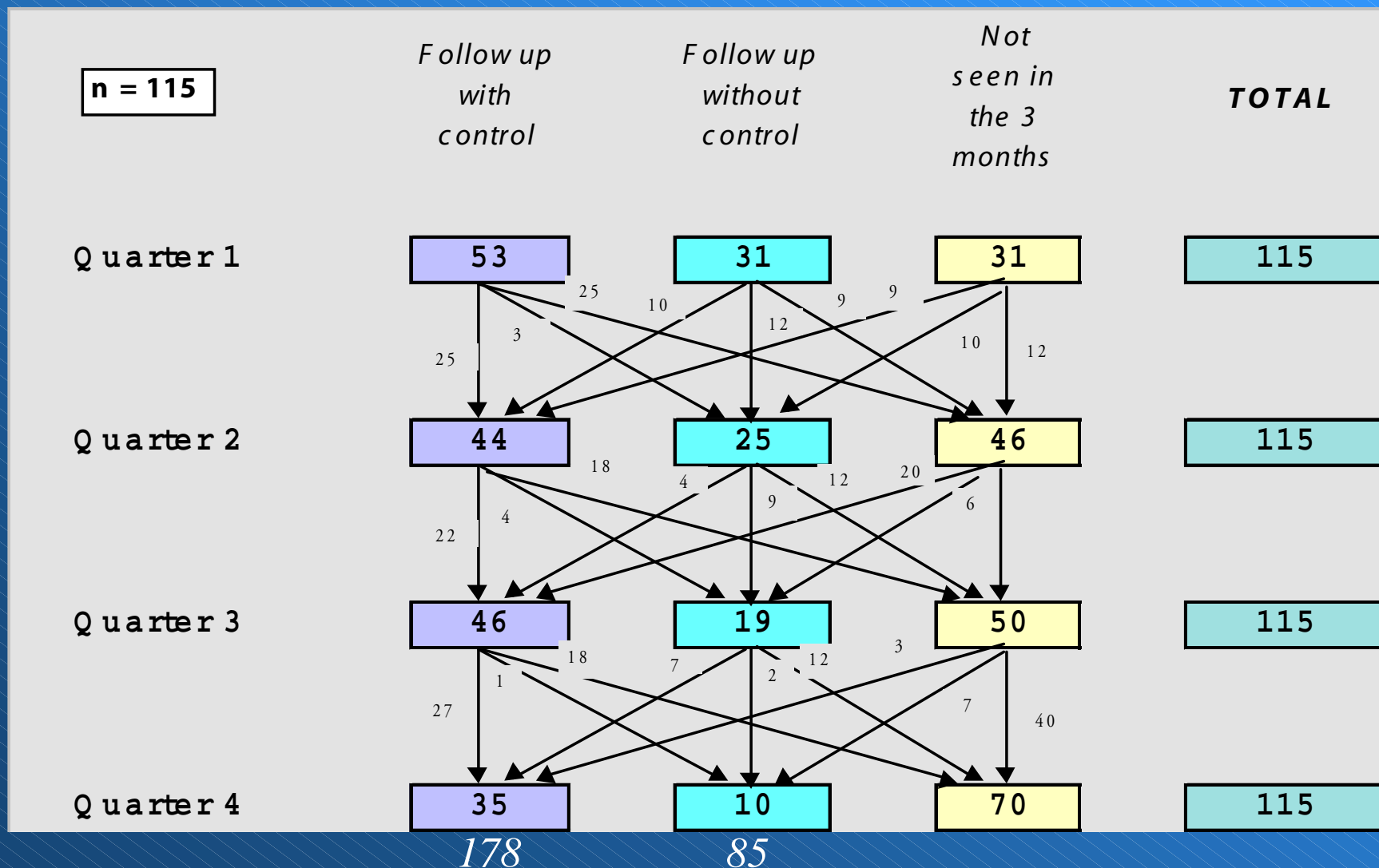
192 PATIENTS

	Follow up with control	Follow up without control	Number of follow up
Before intervention			
Quarter 1	70	68	138
Quarter 2	55	49	104
Quarter 3	46	37	83
Quarter 4	31	28	59
TOTAL patient-quarter follow up	202	182	384

Outcome of Asthmatic Patients

12 Months Follow Up After Intervention

115 PATIENTS



Patient Control and Non Control Follow Up for 12 Months After Intervention

115 PATIENTS

	Follow up with control	Follow up without control	Number of follow up
After intervention			
Quarter 1	53	31	84
Quarter 2	44	25	69
Quarter 3	46	19	65
Quarter 4	35	10	45
TOTAL patient-quarter follow up	178	85	263

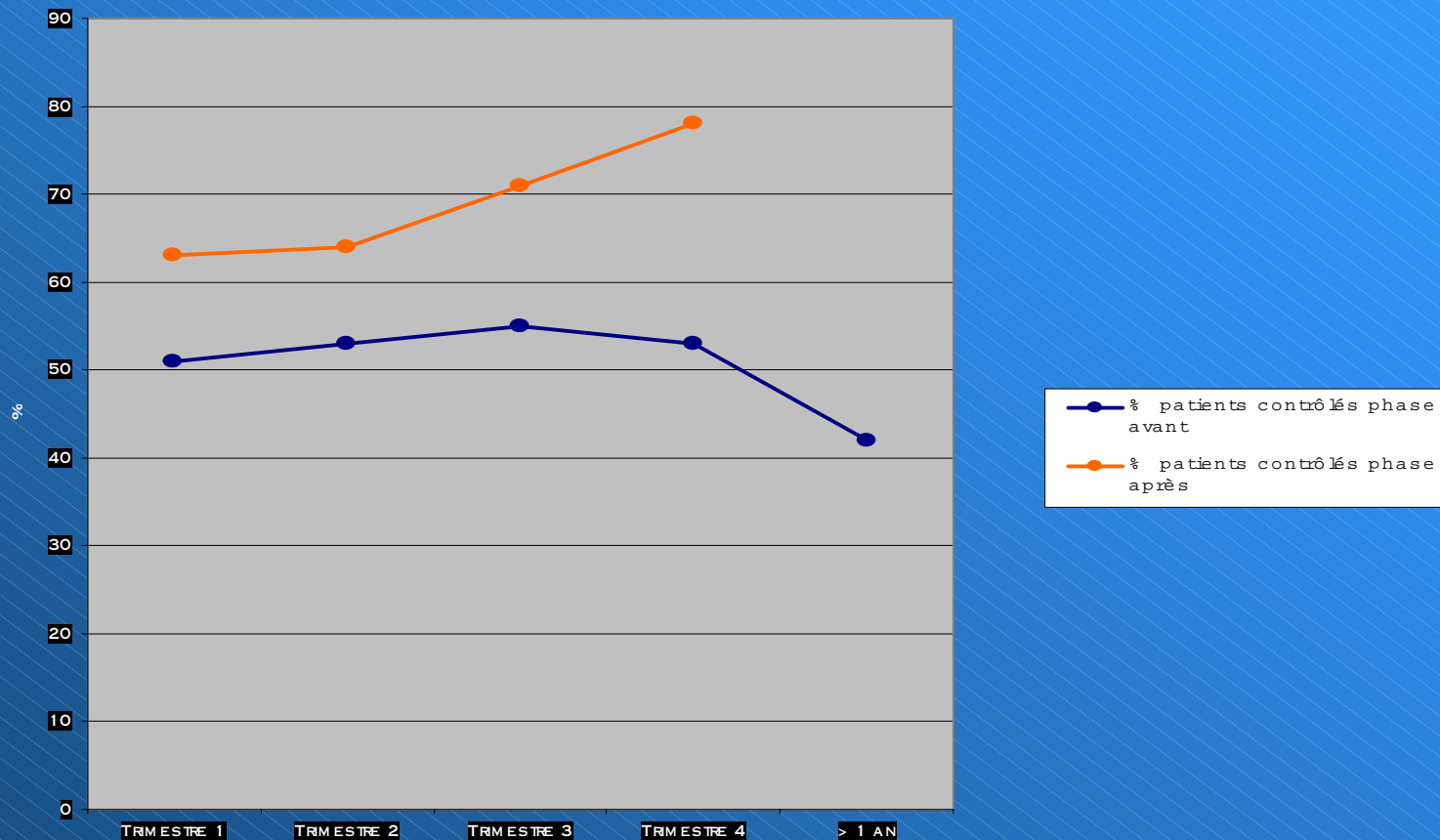
Quarterly Asthma Control Rate 12 Months Before and 12 Months After Intervention

Before 202 : 384 = 52.60

After 178 : 263 = 67.68

Incremental effectiveness = + 15.08 %

Change in Asthma Control Rate « Before - After » Intervention

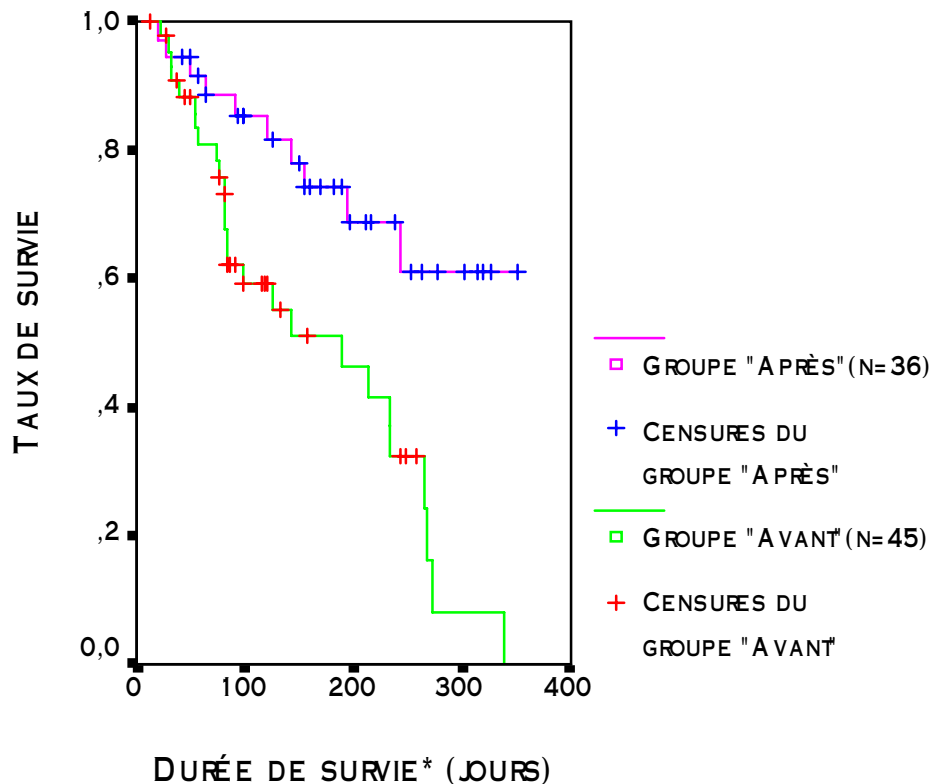


Comments:

52.6% of patients controlled (before phase) vs 67.7% (after phase) i.e. a gain in patients controlled per quarter of **15.08 %**

Comparison of Time Spent with Controlled Asthma Before and After Intervention

COURBES DE SURVIE "AVANT" - "APRÈS"



Estimation of median time before becoming non controlled:

Before : 190 days

CI (95%) = [84 , 266]

After : > 352 days

CI (95%) = [243 , .]

P = 0.002

* *Survival time (days) = time between first follow up consultation (controlled) and becoming non controlled*

Comparability of « Before - After » Groups

Study of Socio-Demographic Characteristics

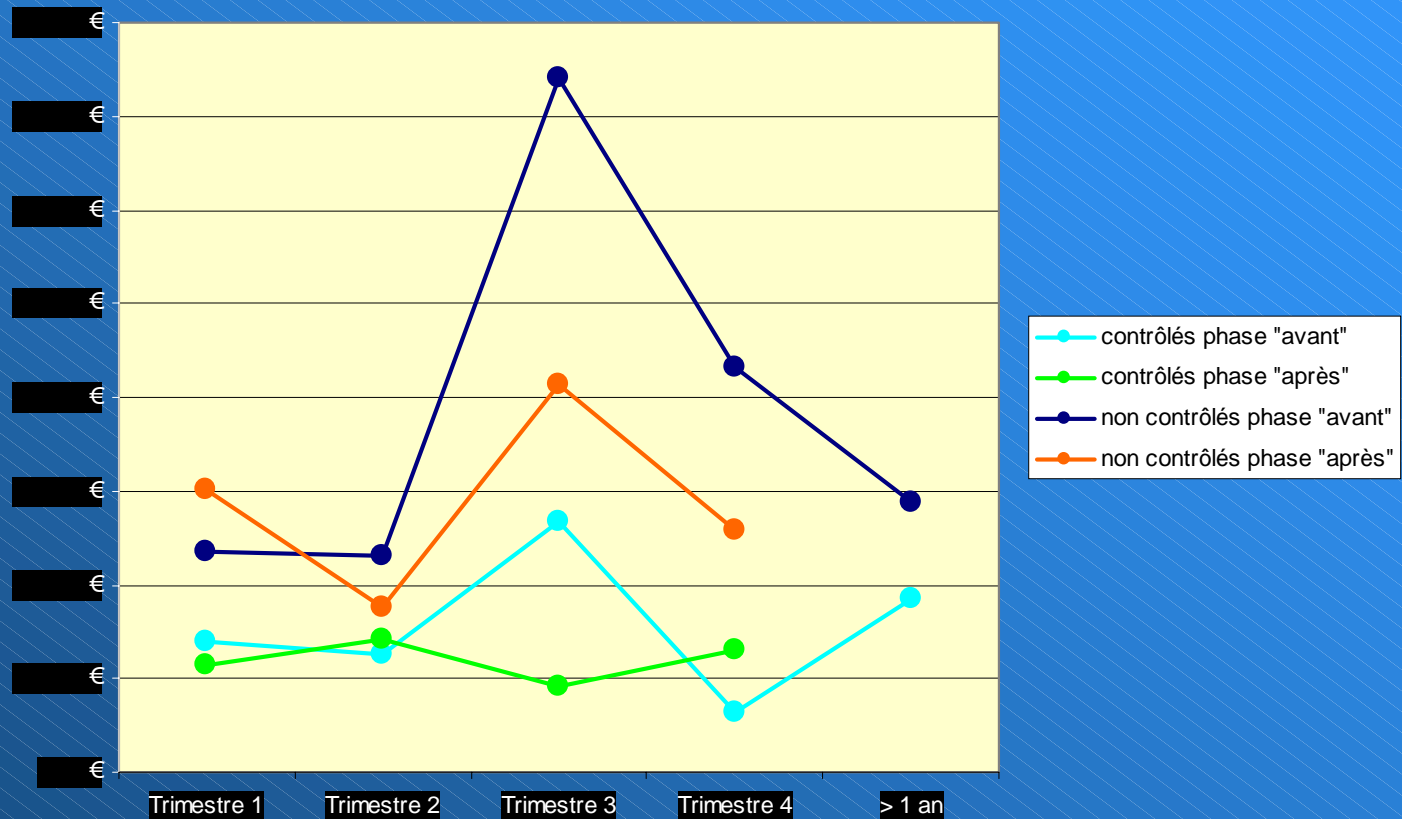
	« Before » Group (n=45)	« After » Group (n=36)	p*
Sex	men: 51 % women: 49 %	men: 58 % women: 42 %	0. 52
Age	41.8 ± 2.9 years	47.5 ± 3.4 years	0. 68
CSP Occupation Health Insurance system			> 0. 30
Length of history of asthma (years)	16.4 ± 1.8 years	14.3 ± 2.4 years	0. 28

**Student test for continuous variables; Chi2 test for qualitative variables*

FINANCIAL IMPACT

Mean Quarterly Cost of Follow Up (€₂₀₀₁)

Controlled vs Non Controlled



Comments:

- The cost of a non controlled patient for 1 quarter is always higher than that of a controlled patient.
- Impact of a rare event: hospitalisation in cost variability.
- The mean cost per quarter in the before phase is higher than in the after phase both in controlled and in non-controlled patients.

Comparison of Quarterly costs

« Before-After » (€₂₀₀₁)

All Statuses Combined

Nature of Consumption	Follow up After Intervention n = 384	Follow up after intervention n = 263
Total costs	255,2	172,2
Direct costs	250,7	162,3
Medical costs	31,2	31,0
Drug costs (all)	92,5	103,0
Anti-asthma drug costs	82,0	92,8
Hospital costs	81,8	24,7
Investigation costs	45,3	3,6
Indirect costs	4,5	9,9

Comments:

Reduction in total costs of 83 €per patient per quarter

Large reduction in hospital cost : 57 €per patient per quarter

ECONOMIC IMPACT

Incremental Cost Effectiveness Ratio of Follow up of Asthma for 3 Months Before and After Intervention

$$\frac{\text{IC}}{\text{IE}} = \frac{172.13 \text{ €} - 255.23 \text{ €}}{67.7 \% - 52.6 \%} = \frac{-81.10 \text{ €}}{+15.08 \%} \quad (-32.4 \%)$$

- 172.13 € : Cost of 3 months follow up after intervention
- 255.23 € : Cost of 3 months follow up without intervention
- 67.7 : Rate of follow ups with control over 3 month period after intervention
- 52.6 : Rate of follow ups with control over 3 month period before intervention

Conclusion ^{1/2}

- Change in state of health in the RESALIS* cohort, one year after introducing the network
 - **15% gain in patients whose asthma was controlled over a period of one quarter one year after introducing the network**
 - 52.6% of patients controlled over a quarter in the Before Network phase
 - 67.7% of patients controlled over a quarter in the Network phase

⇒ **Positive initial results for the network in terms of improvement of patient's state of health**

* *to be compared subsequently to the « others » group*

Conclusion ^{2/2}

- Changes in cost for the RESALIS* cohort, one year after introducing the network
 - **Fall in total quarterly patient cost of 83 €**
 - Totally quarterly cost per patient in the before phase 255.2 €
 - Total quarterly cost per patient in the network phase: 172.2 €
 - the cost incurred by a controlled patient is invariably less than that incurred by a non-controlled patient
- ⇒ **Positive initial results for the network in terms of reduced cost**