

*International Symposium on Health Care Evaluation  
of Integrated Delivery Systems - Performance  
Measurement - Berlin 6-9 July 2000*

**Evaluation of Integrated Health Delivery  
System : Example from France**

*Robert Launois*

Université Paris XIII

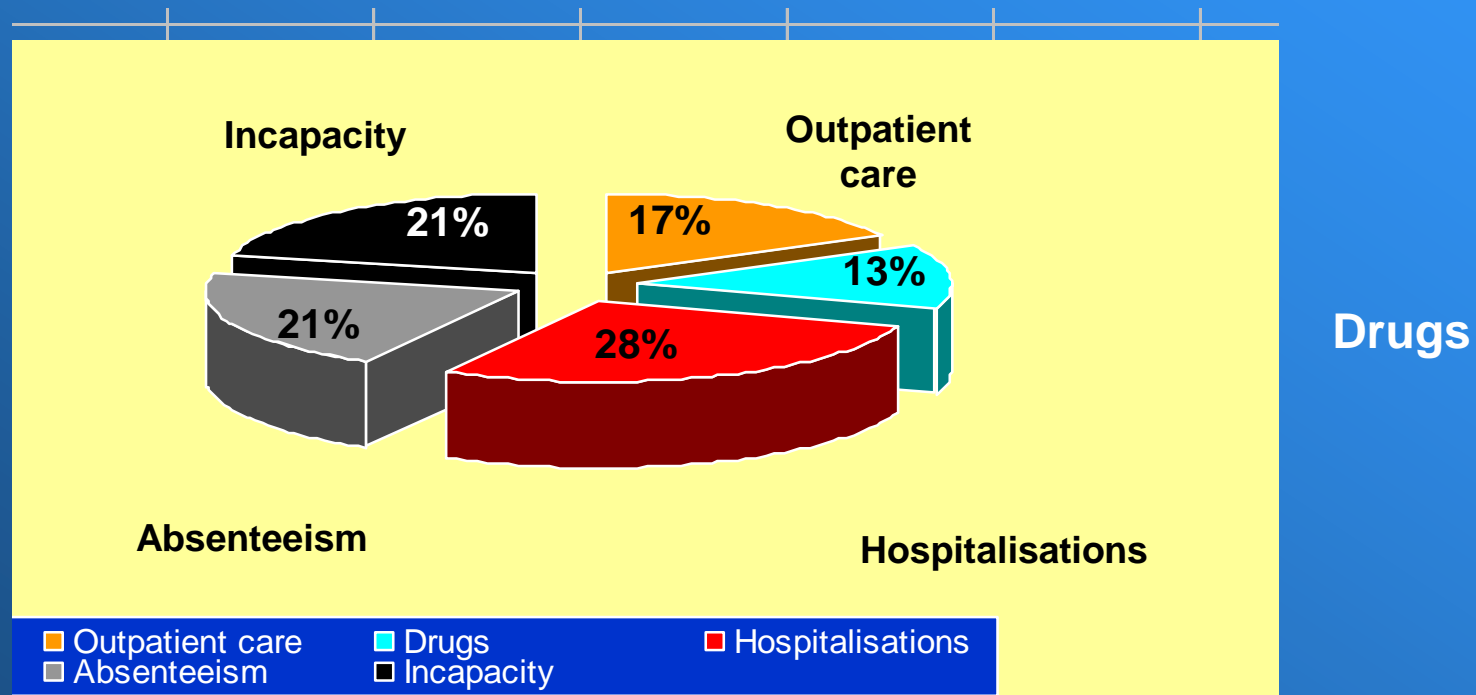
**<http://smbh7.smbh.univ-paris13.fr>**

# ASTHMA: A Public Health Challenge

- ◆ **A common disorder**
  - ⇒ prevalence between 5 and 7% in France
  - ⇒ 3 million patients in France
  - ⇒ Eure: prevalence close to 7% ?
  
- ◆ **Prevalence is increasing**
  - ⇒ 10% in school age children

# An Expensive Disorder

7 Billion Francs per year in France



Source : CREDES - 1996

# OBJECTIVES OF THE STUDY

To show that management of patients in the framework of a **Co-ordinated Care Network<sup>®</sup>**

enables:

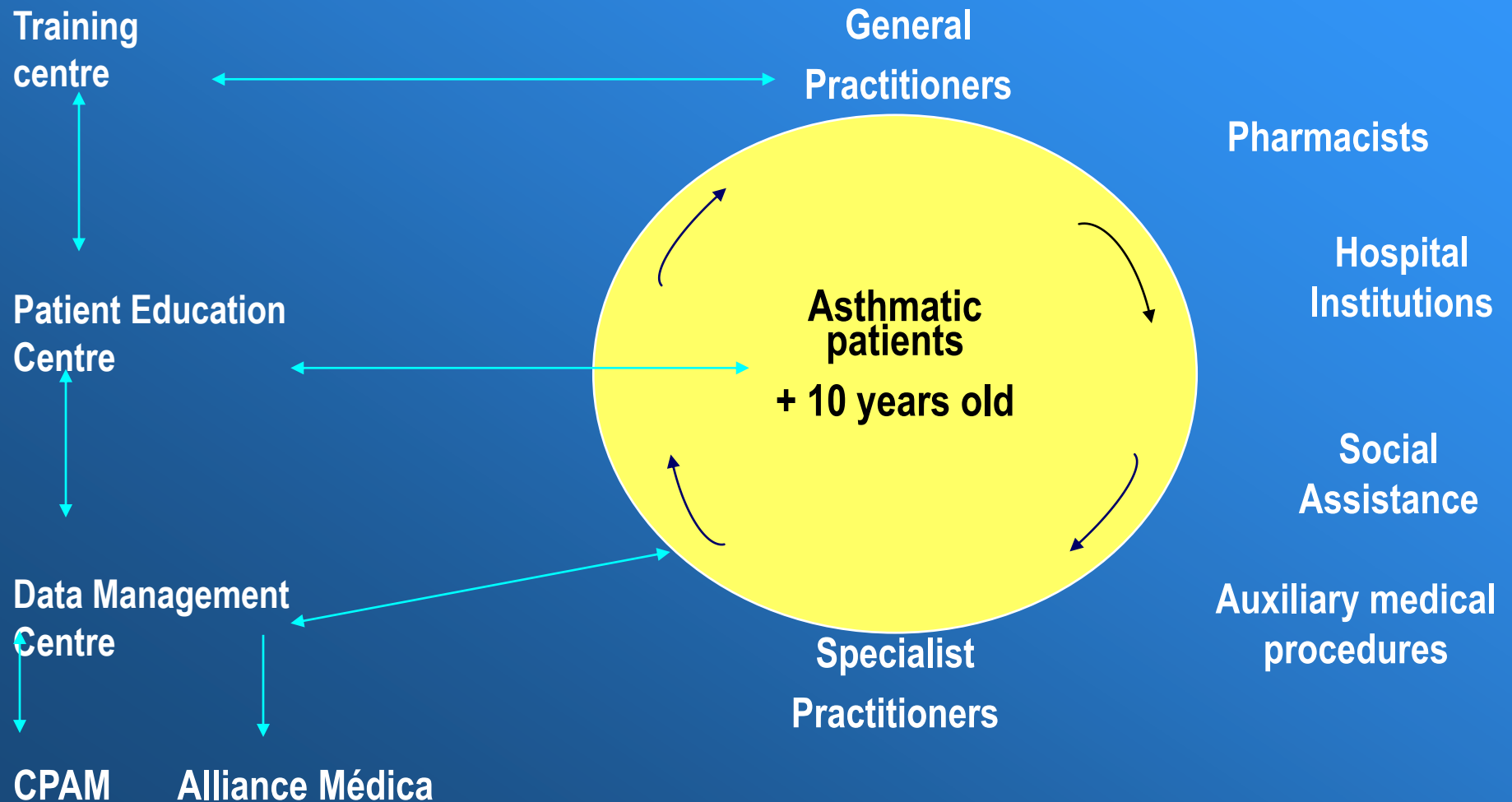
- Quality of care to be **improved**
- Avoidable costs to the Assurance Maladie to be **reduced**

# DESCRIPTION OF THE INTERVENTION

- **Organisation of the Network**
- **Information System**
- **Methods used**

# RESALIS : A Healthcare Network in Asthma

Plan of RESALIS: the patient at the heart of the network

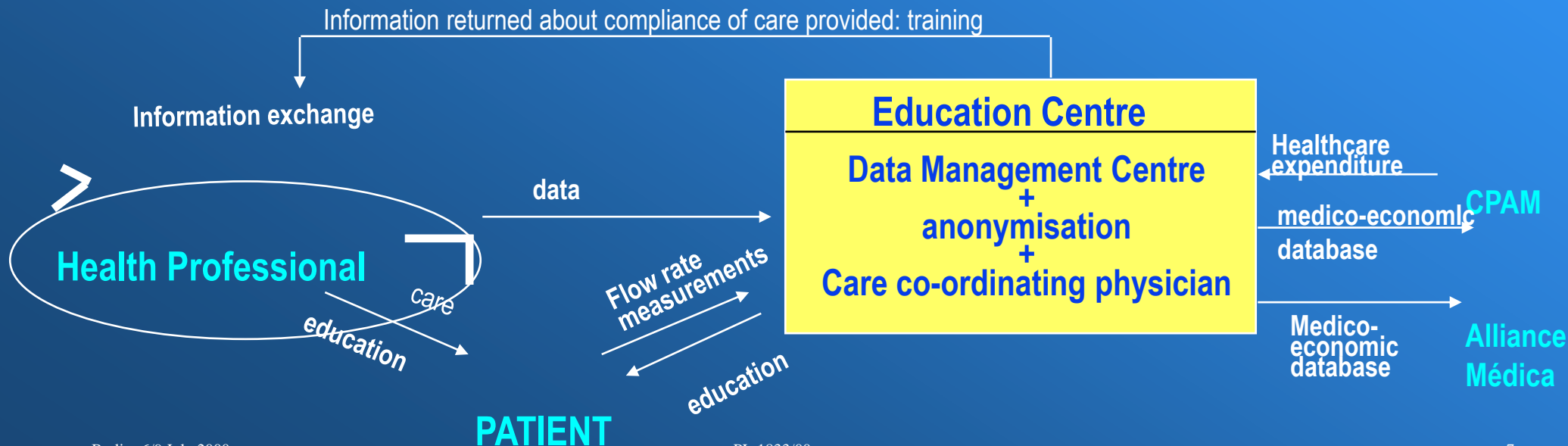


# RESALIS : The Information System

## Objectives

- To communicate between health professionals via a secure network compatible with Social Health Network (Réseau Santé Social)
- To collect the data required for the medico-economic evaluation
- To improve patient management by individualised care for patients or health professionals by comparing the patient's healthcare pathway to the reference healthcare pathway

## Information flow



# What does a network do ?

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



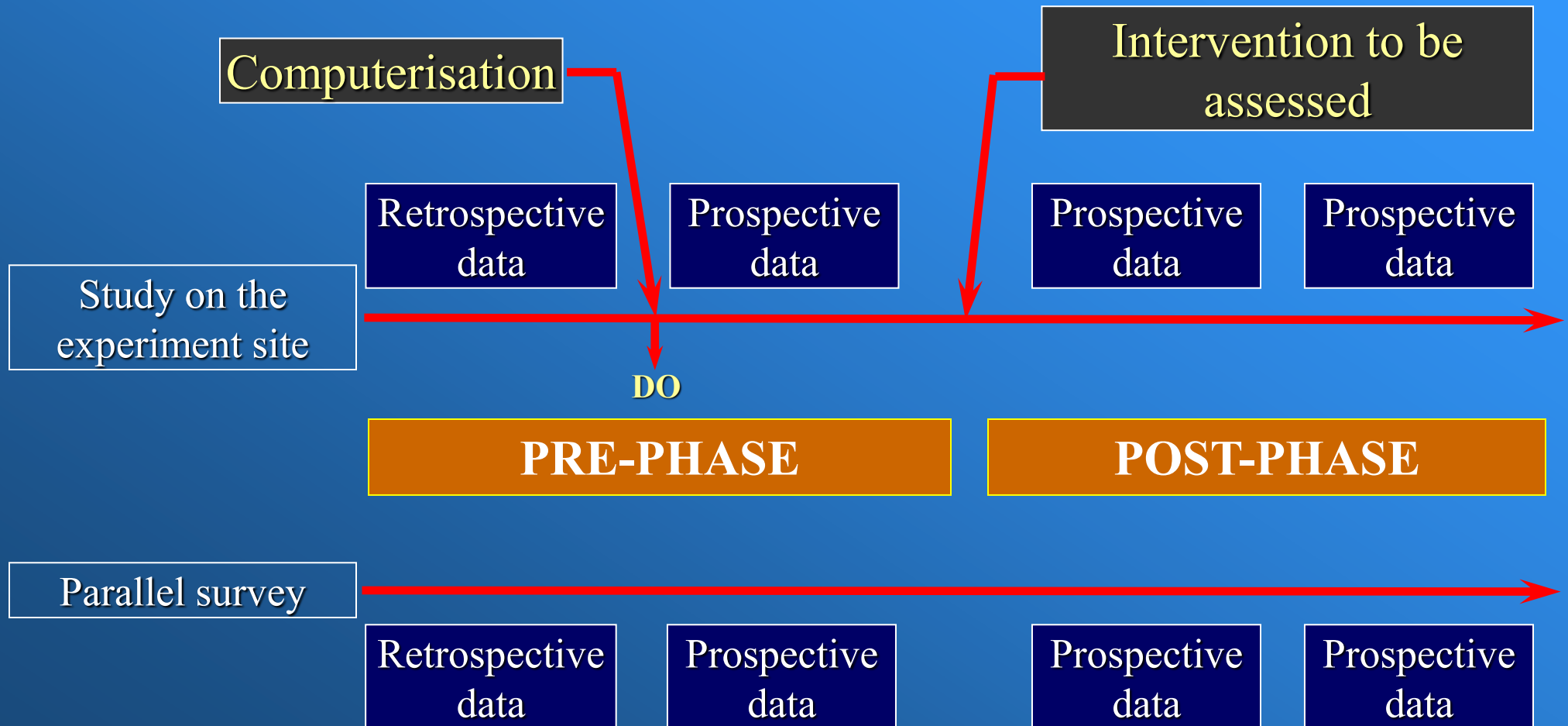
# RESALIS : Methods used

- **Reference medical management for asthmatic patients**
- **Training healthcare professionals**
- **Educating asthmatic patients**
- **The Breathing Centre**
- **A medico-economic evaluation**

# MEDICO-ECONOMIC EVALUATION

- **Plan of the study**
- **Inclusion criteria**
- **Structure of the database**
- **Stratification of the population**
- **Cost estimation**
- **End points**

# Plan of the Study : Before - After



# Information Registration

RESALIS

Fichier Edition Insertion Enregistrements Fenêtre ?

TITI CAMARA (Né(e) le 22/11/69) Dr. Florian LANCON

Questionnaire suivi

Consultation/visite initiale

Recours Médical/Prescriptions Prescriptions/Issue Prescription médicaments

**MEDICAL**

Réalisation d'une mesure du DEP  Non  Oui

Meilleure des trois mesures du DEP (l/mn)

Réalisation d'une désensibilisation  Non  Oui

Asthme allergique  Non  Oui  Ne sait pas

**PRESCRIPTION**

Prescription de séance(s) de kinésithérapie respiratoire  Non  Oui

Nombre de séances

Prescription d'examens paracliniques hors biologie  Non  Oui

Radiographie thoracique  
Radiologie des sinus  
(Autre)


Prescription d'examens biologiques  Non  Oui

NFS  
VS  
IONO  
Plaquettes  
Gaz du sang  
Théophyllinémie  
(Autre)

Fermer Continuer >

Avez-vous prescrit au patient des examens biologiques ?

MAJ NUM



# Structure of the Database

*15 files - 515 variables*

## ***SOCIO-DEMOGRAPHIC CHARACTERISTICS***

Patients; Doctors

## ***HISTORY OF THE DISORDER AND CLINICAL COURSE ON TREATMENT***

Retrospective record, prospective record before the intervention

Past history, Concomitant disorders

Grades of severity of the asthma

Contacts with the healthcare system and patient pathways

## ***MEDICAL CONSUMPTION***

Use of doctors – Use of hospital

Skin tests - Desensitisation – Respiratory function tests

Paraclinical investigations – Auxiliary medical procedures

Prescription of drugs

## ***SOCIAL CONSEQUENCES***

Loss of work and absence from work – Absence from school

# Detailed Analysis of the Variables for Outpatient Consultations

<b>DATSUIVI</b>	<b>Date of use (YYYYMMDD)</b>
<b>TYPEREC</b>	<b>Type of use (visit, consultation, external consultation, day hospital)</b>
<b>MAJOHONO</b>	<b>Increased fee (YES/NO)</b>
<b>MAJOURG</b>	<b>Increase for emergency (YES/NO)</b>
<b>MAJONUIT</b>	<b>Increase for night (YES/NO)</b>
<b>MAJODIM</b>	<b>Increase for Sunday (YES/NO)</b>
<b>PREXAPAR</b>	<b>Prescription of paraclinical investigations (YES/NO)</b>
<b>PREXAHB</b>	<b>Prescription of paraclinical investigations excluding laboratory (YES/NO)</b>
<b>PREXABIO</b>	<b>Prescription of laboratory investigations (YES/NO)</b>
<b>PREDUC</b>	<b>Prescription of education session (YES/NO)</b>
<b>PRCURETH</b>	<b>Prescription of thermal health cure (YES/NO)</b>
<b>CURHOSP</b>	<b>With hospitalisation (YES/NO)</b>
<b>PRSEJCLI</b>	<b>Prescription of stay in different climate (YES/NO)</b>
<b>AT</b>	<b>Sick note (YES/NO)</b>
<b>ATTYPE</b>	<b>Type of sick leave</b>
<b>ATDUREE</b>	<b>Length of sick leave (days)</b>
<b>ABPROFDU</b>	<b>Length of absence from work (days)</b>

# Stratification of the Population by Grade of Severity

## *Grade 1 : intermittent asthma*

Intermittent symptoms: less than once per week

Short exacerbations - PFR or FEV<sub>1</sub> > 80%    Variability < 20%

## *Grade 2 : persistent mild asthma*

Symptoms occurring more than once per week and less than once per day

Exacerbations which may disturb activities and sleep

PFR or FEV<sub>1</sub> > 80%    Variability of 20 to 30%

## *Grade 3 : persistent moderate asthma*

Daily symptoms - Exacerbations which disturb activity and sleep

PFR or FEV<sub>1</sub> between 60 and 80%    Variability > 30%

## *Grade 4 : persistent severe asthma*

Permanent symptoms – Frequent exacerbations

PFR or FEV<sub>1</sub> < 60%    Variability > 30%

# Cost Estimation

## □ From the point of view of the community

### Direct costs:

hospitalisations, medical procedures, laboratory investigations, other investigations, drugs, thermal health cures

### Indirect costs:

mean hourly wage in France

## □ From the point of view of the Assurance Maladie

### Direct costs:

recognised expenditure reimbursed with and without co-insurance

### Indirect costs:

mean daily social payment in Eure



# End Points

- Agreement of clinical practice with recommendations by grade of severity
- Measurement of the intensity of effort deployed for asthmatic patients
- Calculation of costs

# RESULTS

- Description of the population
- Agreement of clinical practices
- Retrospective estimate of volumes and costs

# Characteristics of Doctors

- 43 doctors belonging to the network
- 21 general practitioners had submitted by 31.12.1999
- 18 men - 3 women
- Mean age, both sexes combined:  $45 \pm 2.5$  years
- Time in the profession:  $14 \pm 3.3$  years
- 18 sector 1 - 3 sector 2
- 33% of subscribers took part in continuing medical education

# Patient Recruitment

*1<sup>st</sup> April - 31 December 1999*

**185** patients *included*

**171** *eligible* patients

**147** *evaluable* patients

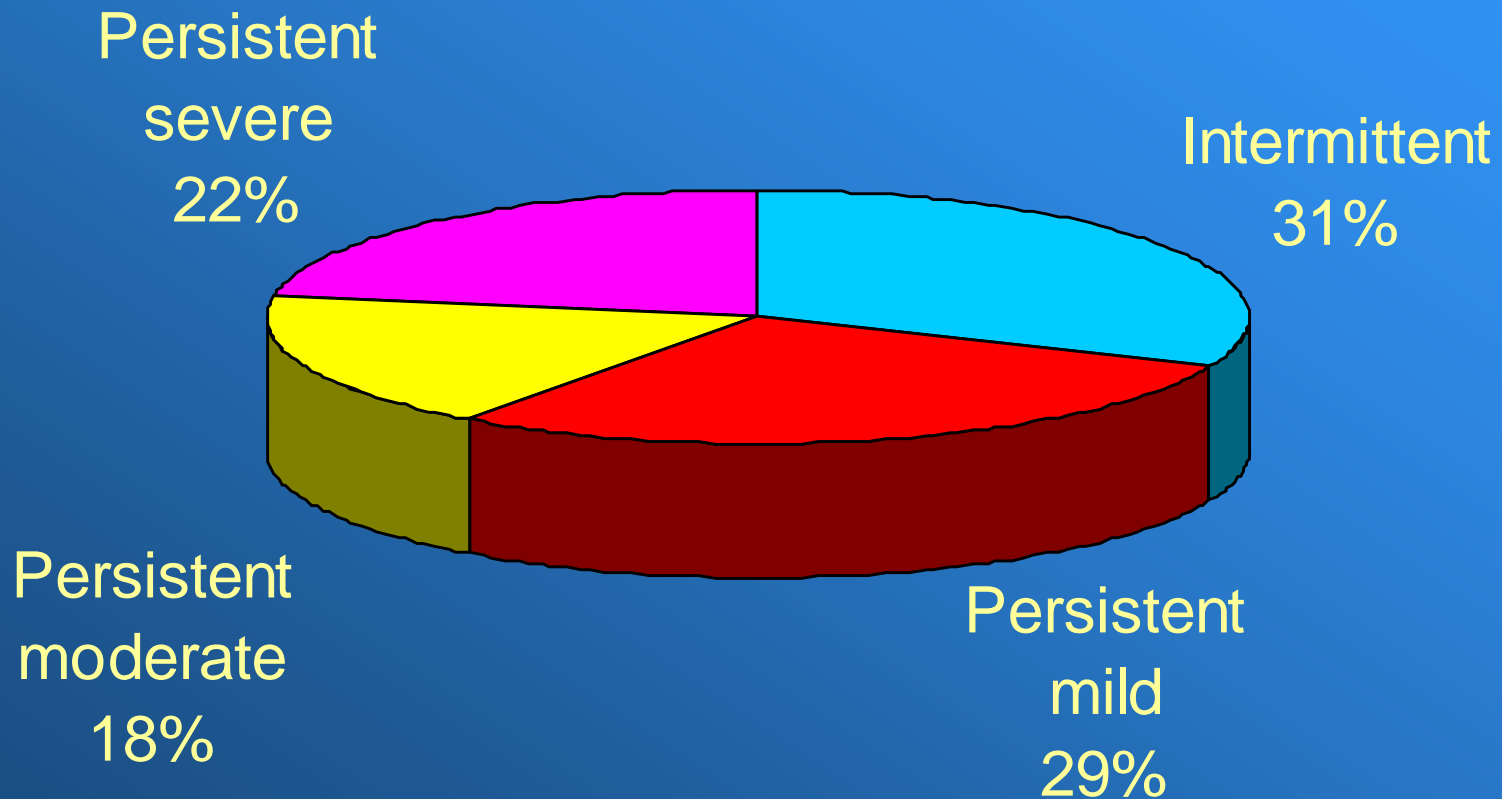
**157** *treated* patients

# Breakdown of Patients

	Treated	Not Treated	Total
Evaluable	138	9	<b>147</b>
Not Evaluable	19	5	24
Total	<b>157</b>	14	<b>171</b>

# Distribution by Grade of Severity

*Source: RESALIS network 1999 - N = 147*



# Good Clinical Practice Recommendations for the Treatment of Symptoms

<b>Grade 1 :</b> intermittent asthma	Inhaled beta 2 stimulant or Cromone (Cromoglycate) before exercise
<b>Grade 2 :</b> persistent mild asthma	Short acting bronchodilator inhaled beta 2 stimulant less than 3 times per day
<b>Grade 3 :</b> persistent moderate asthma	Short acting bronchodilator inhaled beta 2 stimulant less than 3 times per day
<b>Grade 4 :</b> persistent severe asthma	Short acting bronchodilator inhaled beta 2 stimulant less than 3 times per day

Ref : ANDEM. 1996.

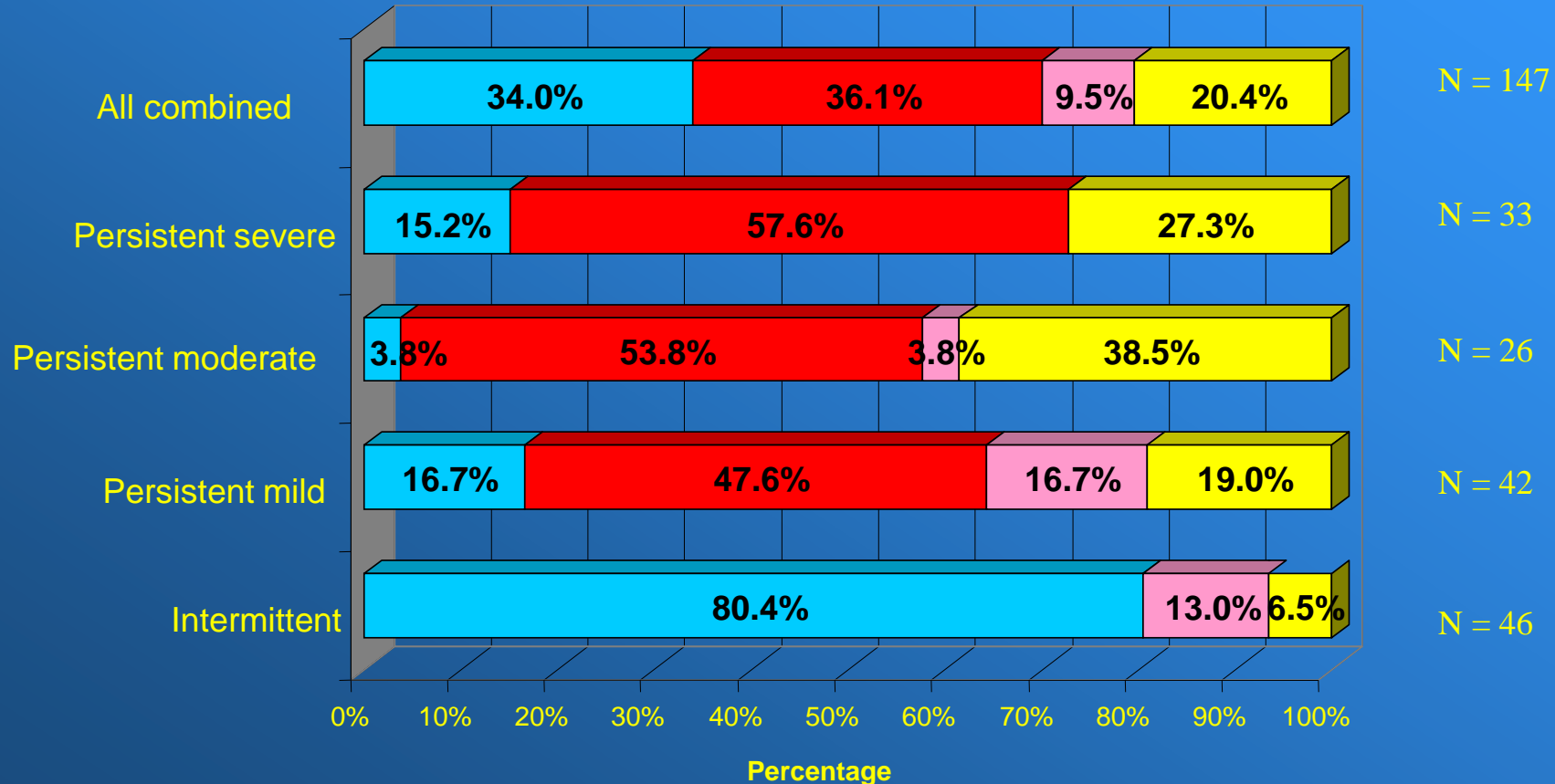
# Good Clinical Practice Recommendations for Maintenance Treatment

<p><b>Grade 1</b> Intermittent</p>	<p>No maintenance treatment</p>
<p><b>Grade 2</b> Persistent mild</p>	<p><b>Inhaled corticosteroids</b> (up to <b>1000</b> µg) <b>or</b> Cromone (Cromoglycate) <b>or</b> Theophylline retard <b>OR</b></p> <p><b>Inhaled corticosteroids</b> (<b>200 – 500</b> µg) <b>Plus a choice of long acting bronchodilator</b>  <b>either</b> Beta 2 LA, inhaled or oral  <b>or</b> Theophylline retard</p>
<p><b>Grade 3</b> Persistent moderate</p>	<p><b>Inhaled corticosteroids</b> (<b>800 – 2000</b> µg) <b>Plus a choice of long acting bronchodilator</b>  <b>either</b> Beta2 LA, inhaled or oral  <b>or</b> Theophylline retard</p>
<p><b>Grade 4</b> Persistent severe</p>	<p><b>Oral retard corticosteroids</b> <b>OR</b></p> <p><b>Inhaled corticosteroids</b> (<b>1600 – 2000</b> µg)  <b>and/or</b> long acting bronchodilator inhaled beta2 LA  <b>and/or</b> long acting bronchodilator oral beta2 LA  <b>and/or</b> long acting bronchodilator Theophylline retard</p>



# Agreement of Clinical Practices

## *Breakdown by Clinical Grades and Prescriptions*



# Number of Anti-asthmatic Prescriptions by Grade

*during the 12 months prior to inclusion (N = 147)*

Grade of severity	Number of patients	Number of prescriptions	Range
Intermittent	38	1.71 ± 0.28	1 - 5
Persistent mild	41	2.17 ± 0.34	1 - 5
Persistent moderate	26	2.35 ± 0.42	1 - 5
Persistent severe	33	2.76 ± 0.36	2 - 6
No information	19	2.53 ± 0.46	1 - 5
Total	157	2,25 ± 0,18	1 - 6

# Total Expenditure on Drugs by Grade

*during the 12 months prior to inclusion*

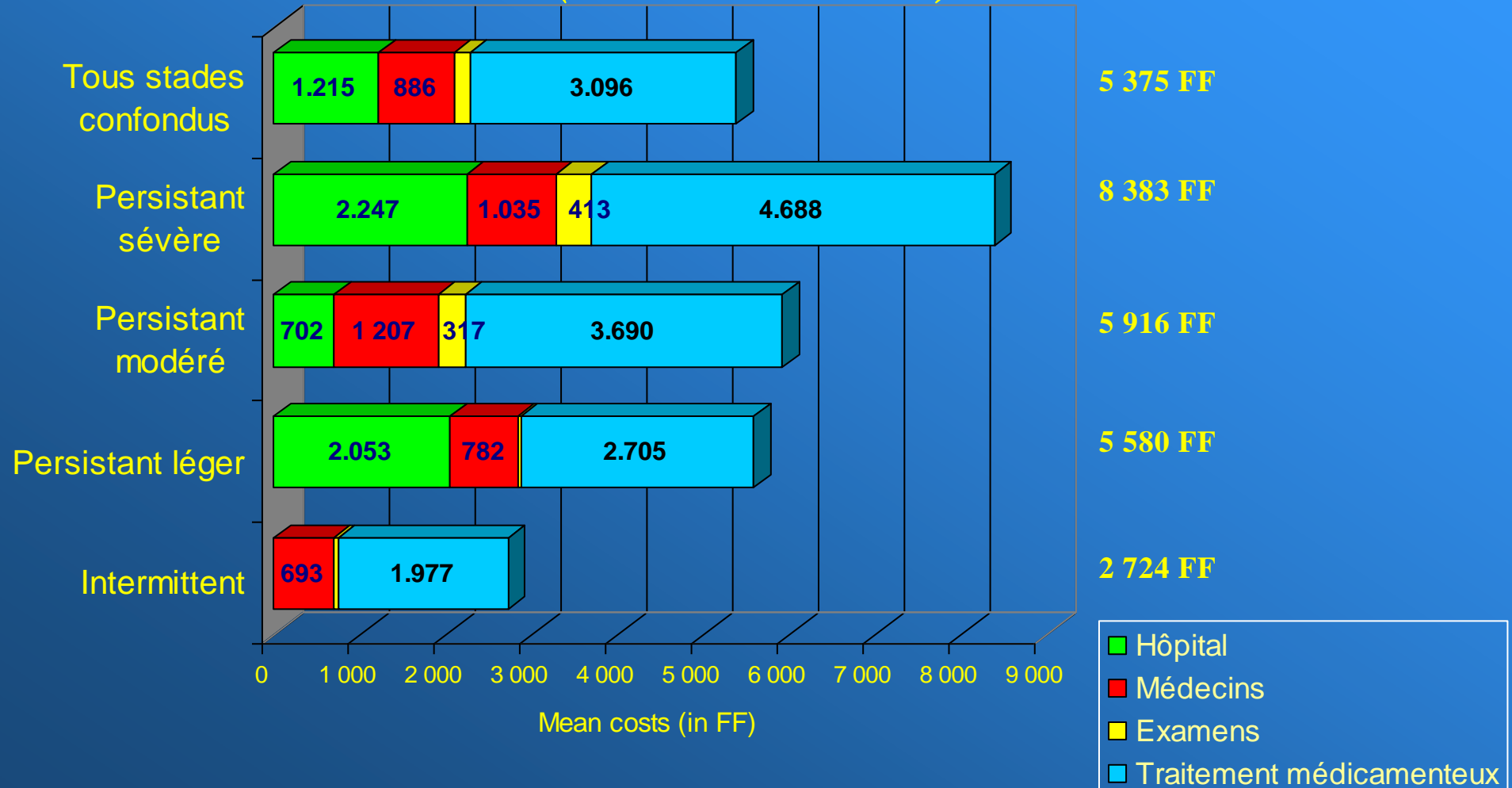
*(N = 147 - FF<sub>99</sub>)*

Grade of severity	Cohort cost to society (FF)	Cohort cost to the Social Security (FF)	% Security
Intermittent (n = 38)	91 273	59 328	77.27
Persistent mild (n = 41)	114 427	85 804	65.00
Persistent moderate (n = 26)	97 592	64 669	74.99
Persistent severe (n = 33)	155 795	125 021	66.26
No information (n = 19)	69 297	53 547	80.25
Total (n = 157)	528 387	388 372	73.50

# Direct costs by Patient and by Grade

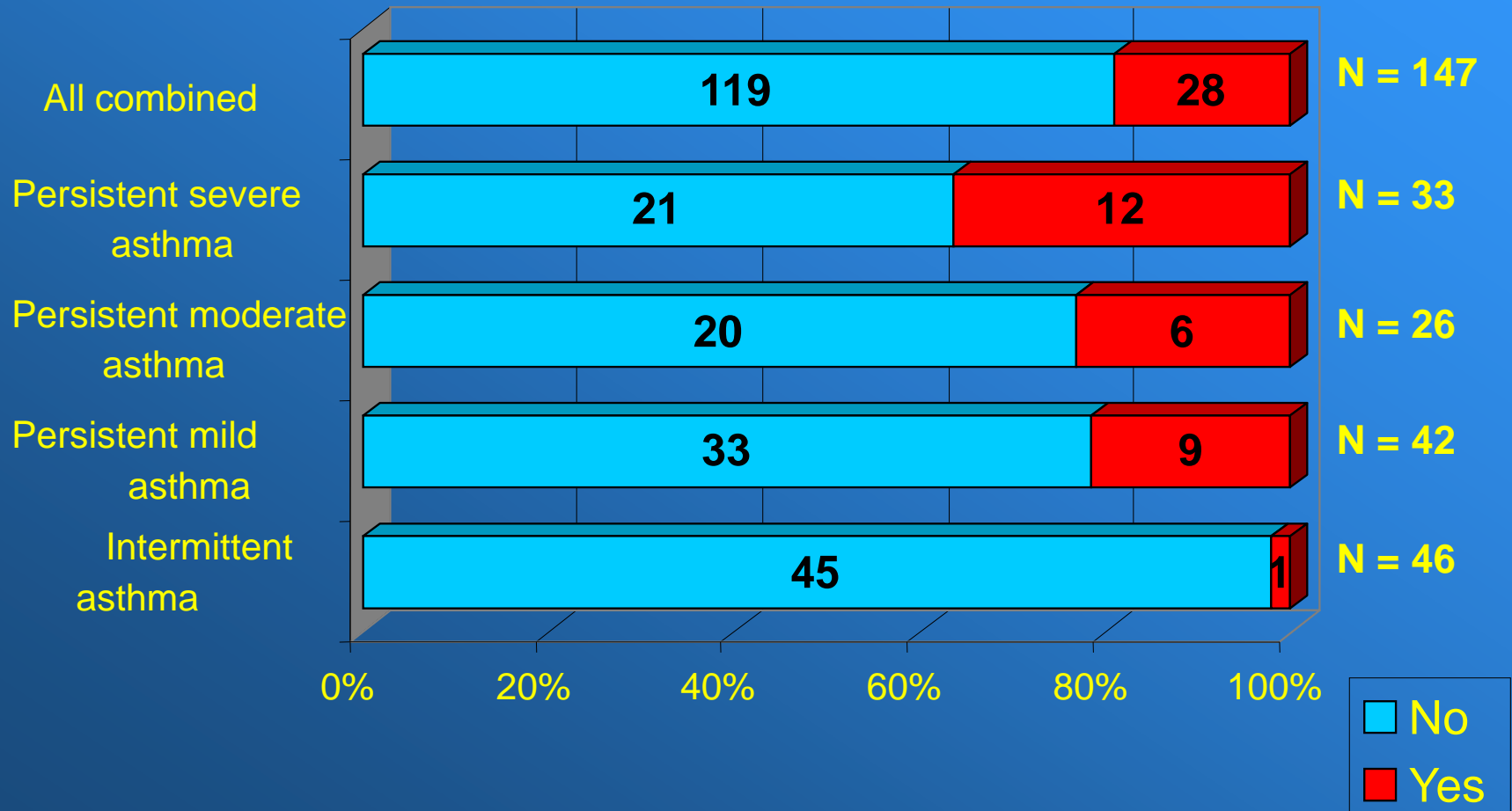
*during the 12 months prior to inclusion*

*(N = 147 - FF99)*



# Long Term Sick Status by Grade of Severity

Source: RESALIS network 1999 - N = 147



# Number of Periods of Loss of Work due to Asthma By Grade

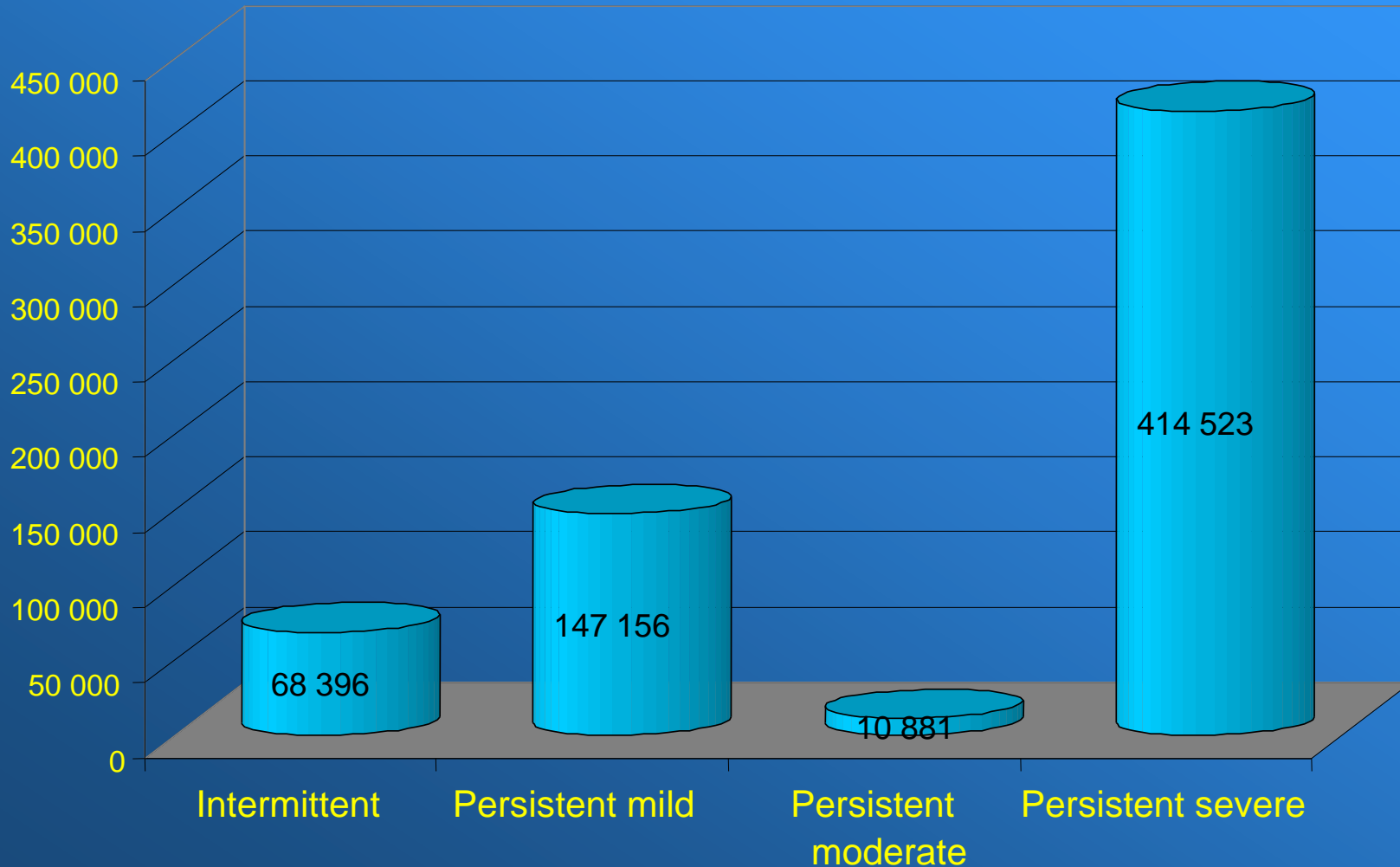
*During the 12 months prior to inclusion*

	Grade of severity				
	Intermittent	Persistent mild	Persistent moderate	Persistent severe	All combined
Number of patients	16	22	6	15	59
Number of patients who lost work	6	7	3	7	20
Number of periods	8	10	6	6	30
Cumulative length of periods (days)	142	280	21	788	1231
Mean length of period (days)	8.9	12.7	3.5	52.5	20.9

# Cost of Loss of Production by Grade

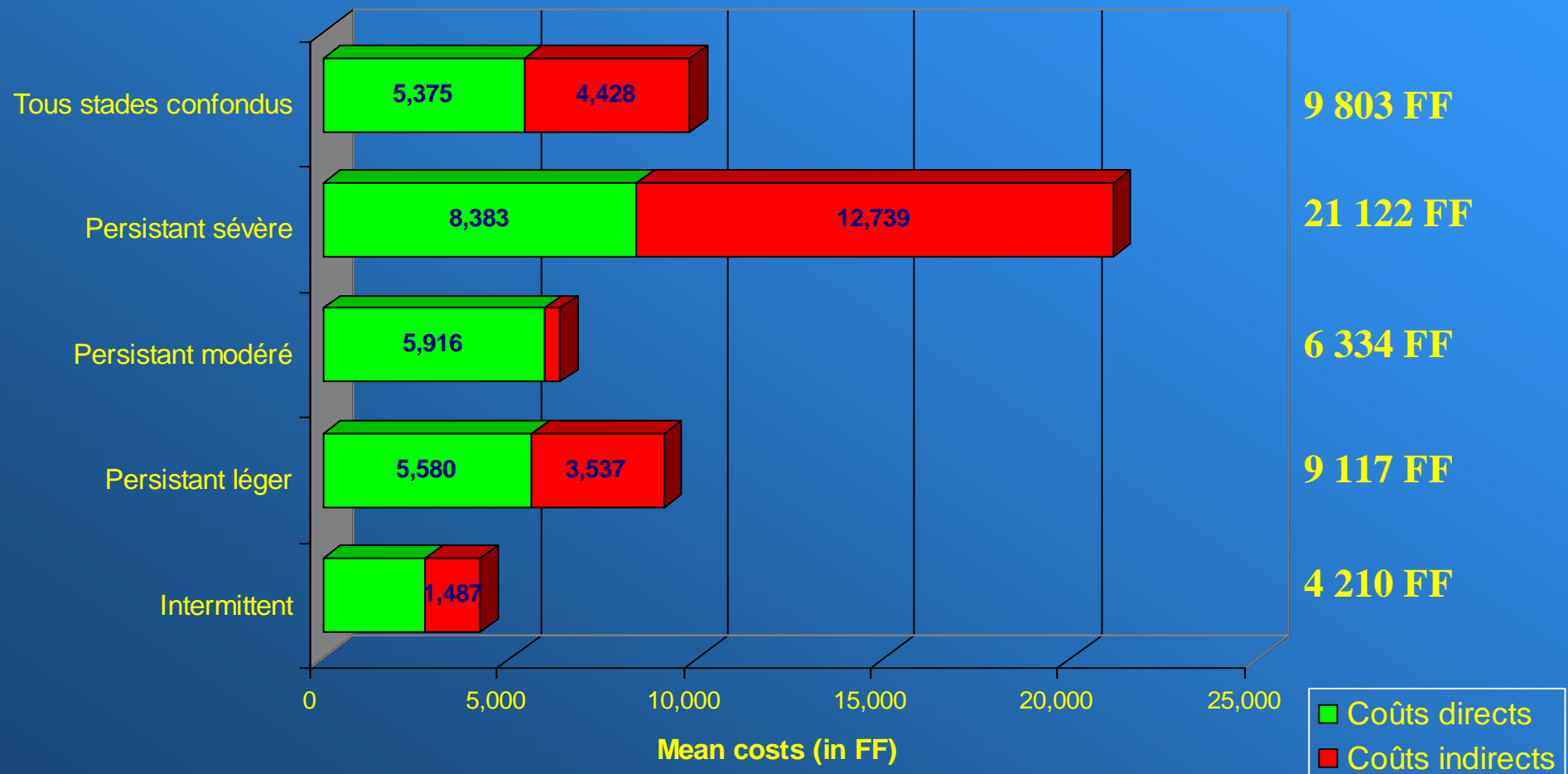
*during the 12 months prior to inclusion*

*(N = 147 - All grades: 640 956 FF<sub>99</sub>)*



# Direct and Indirect Costs by Patient and by Grade of Severity

*during the 12 months prior to inclusion (N = 147 - FF<sub>99</sub>)*





# DISCUSSION

## Strengths of the Experiment

- Exhaustive record of information over a complete year
- Analysis of the effectiveness of treatment under normal conditions of use
- Individualised follow-up of outpatient and hospital care and of social payments
- Identification of possible areas of improvement in the medical service provided

## Limits of the Ex-Post Analysis

- Memory bias from the retrospective data
- Stratification of data on a criterion measured at the time of inclusion

# CONCLUSIONS

Network functioning enables:

- The **pathways** of patients to be identified in the healthcare system
- The extent of the **efforts deployed** to manage these patients to be measured
- The **quality of care** to be confirmed
- **actual costs** by grade of severity to be measured prospectively

**Regardless of the future of our social protection system,  
the healthcare services in the future will inevitably be structured  
around the network concept**