

Perinatal Hospital activities and healthcare pathway optimization in Paris- Ile de France: how to manage the full set of data for regional health authority?

C. Crenn Hebert*, E. Lebreton, C. Menguy, C. Poulain, S. Zemrani

**Maternity dept, CHU Louis Mourier, APHP, Perinat-ARS-IDF, France

Outline

- Introduction
- Objectives and methods
- Results
- Discussion
- Conclusion



Introduction

- Who are we?
 - Our team
 - Our missions
- Where do we work?
- This is a work in progress...



Our permanent team

Elodie Lebreton: statistician and epidemiologist

Chloe Poulain: statistician

Dr Claudie Menguy: neonatologist paediatrician and hospital data manager

Dr Catherine Crenn Hebert*: obstetrician and epidemiologist

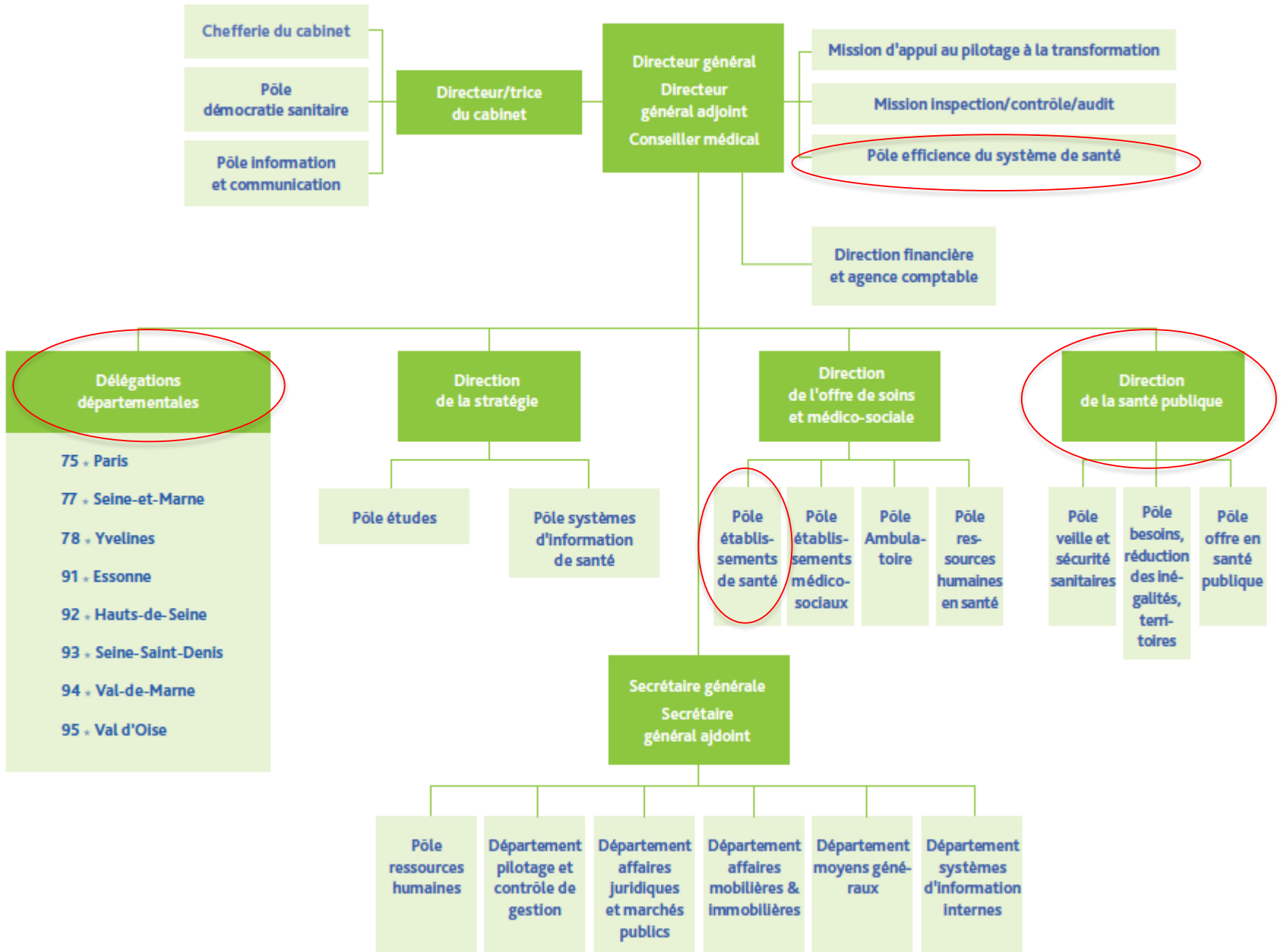
**conflict of interest: none*



Our missions

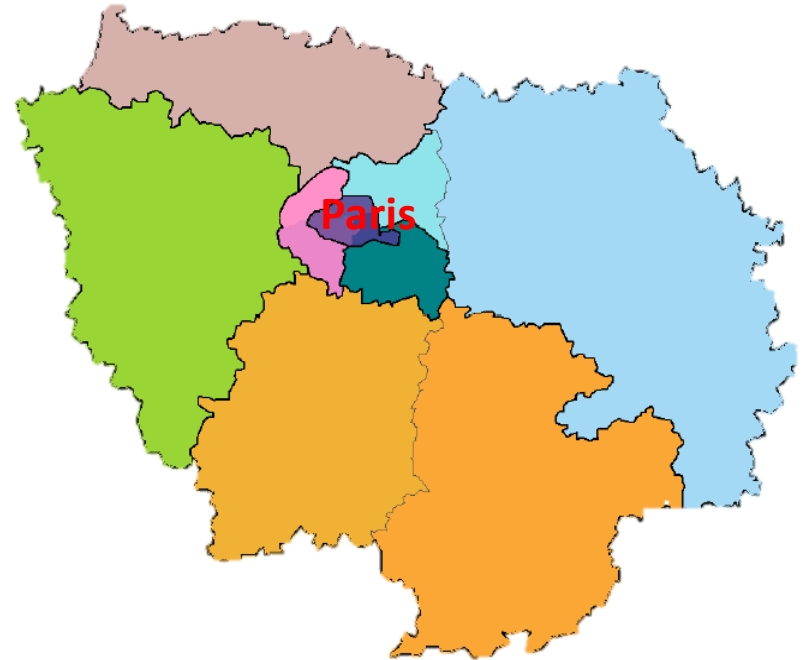
- To build an **Information System in perinatal health** for Paris Ile de France region « www.perinat-ars-idf.org »
- Data feed back **to perinatal networks** providers (Dr, midwives, ..)
- Data reporting to Regional Health Authority **ARS**:
 - > **public health** dept
 - > **planning** dept
 - > **efficiency** dept

Organigramme Mai 2016





Metropolitan France
13 Regions
800,000 births



Paris- Ile de France Région
8 districts
7 perinatal networks
180,000 births (24%)



Objectives and methods

- Describe 3 main questions:
 - 1 / Regional perinatal health plan assessment
 - 2 / Perinatal activities authorization plan
 - 3/ Healthcare pathways and perinatal networks
 - > « Shared territorial diagnosis »
- **Case study:** « Hauts de Seine » = « 92 » perinatal network



Data sources

Region

- Census data
- Hospital Discharge Data system (n-1):
 - Focus on 40 indicators: case-mix , process, outcomes
 - Evolution 2013, 2014, 2015

Case study in Hauts de Seine district:

- Maternity authorization file Questionnaires: : staff and structures resources and activities level
- Survey among midwives and ambulatory care

Results - 1

1 / Regional perinatal health plan assessment

Using Deming's cycle:

Plan: quality and efficiency warranted with reduced social and territorial health inequities

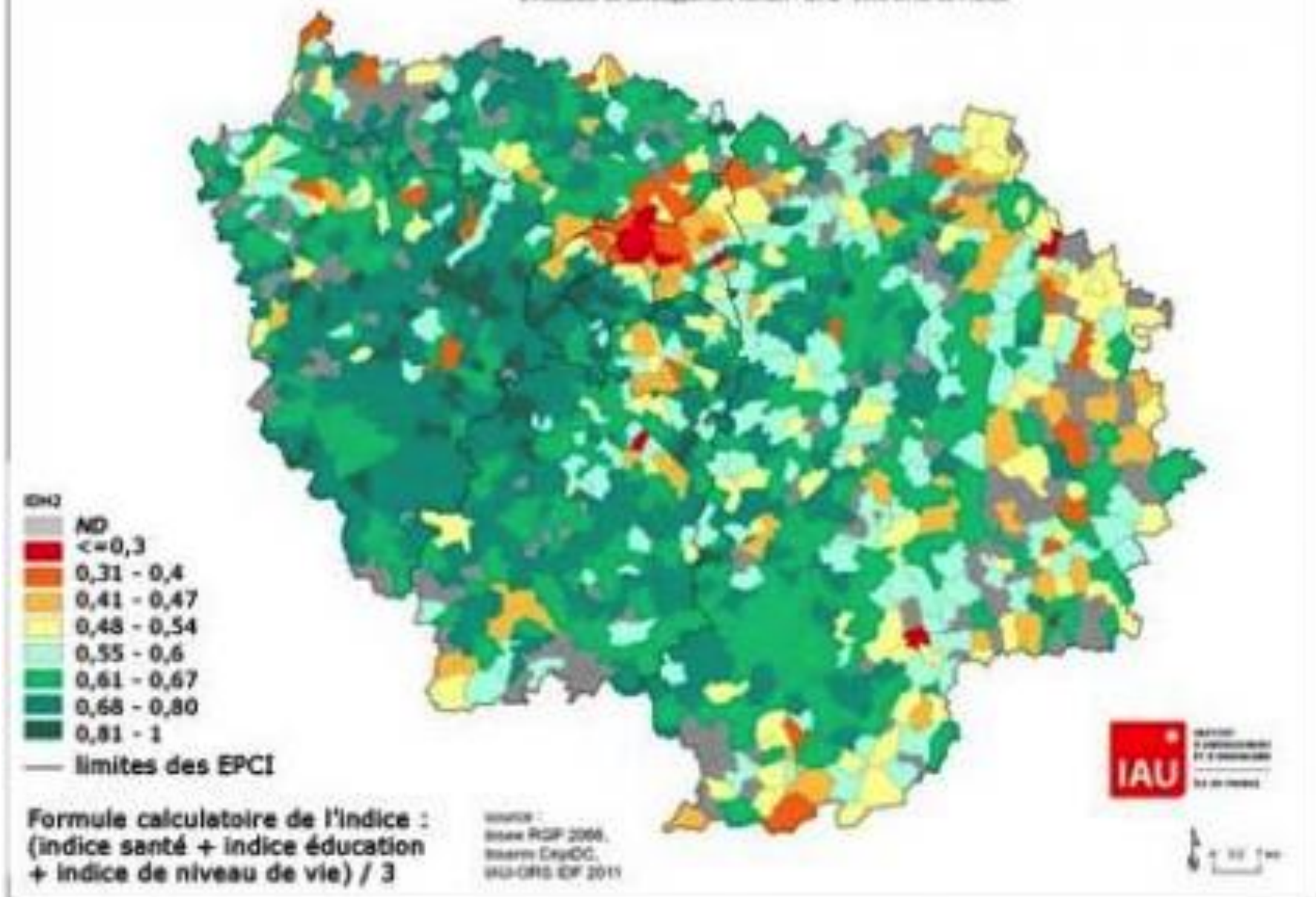
Done: ex maternities restructurations, networks responsibilities increase

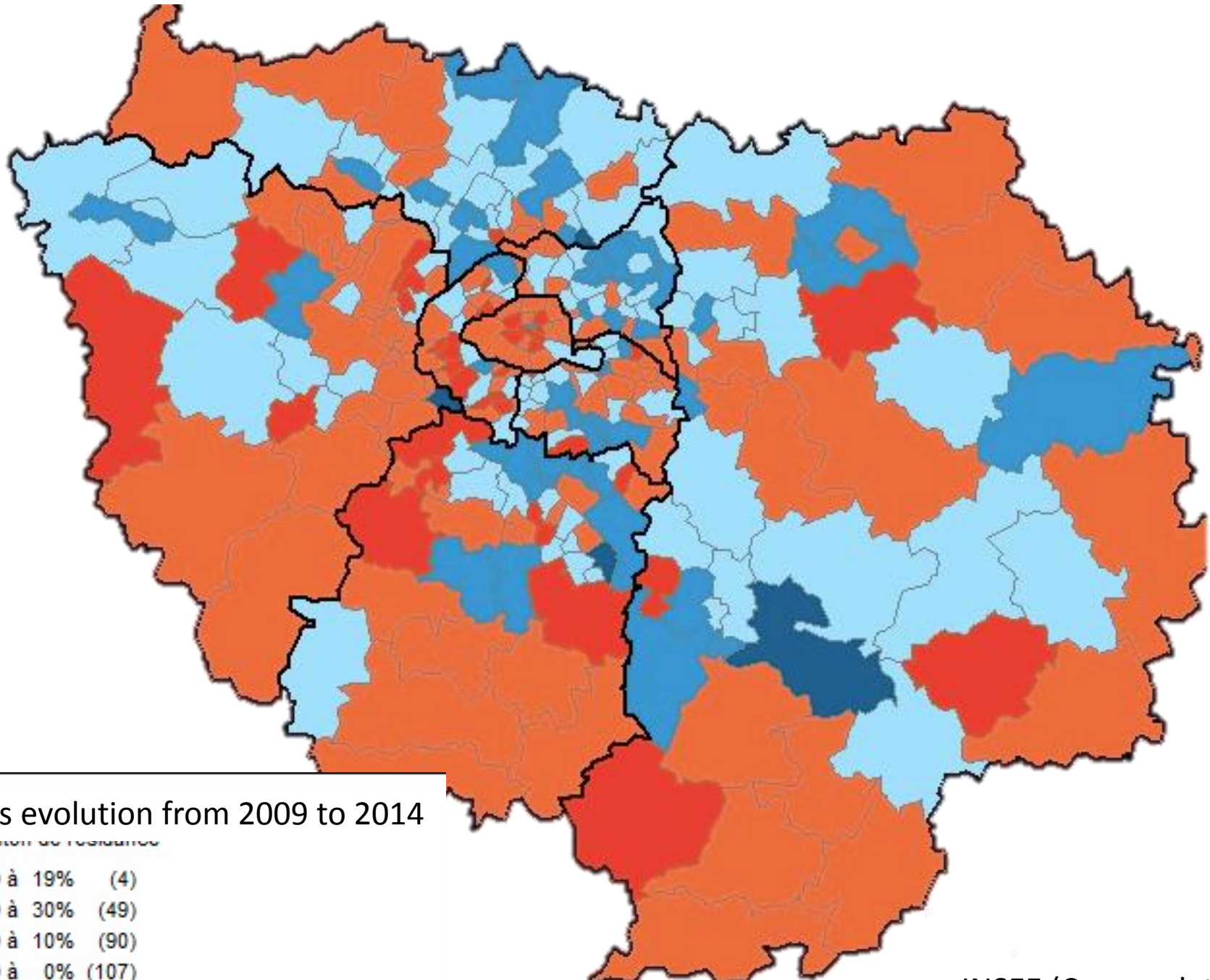
Check: perinatal outcomes: ex birth place adequation for premature babies

-- > Before Act...

Human development Index in IDF: life expectancy, education level, incomes

L'indicateur de développement humain - IDH - 2008 en Île-de-France





Births evolution from 2009 to 2014

par canton de résidence

- 30 à 19% (4)
- 10 à 30% (49)
- 0 à 10% (90)
- 10 à 0% (107)
- 40 à -10% (36)

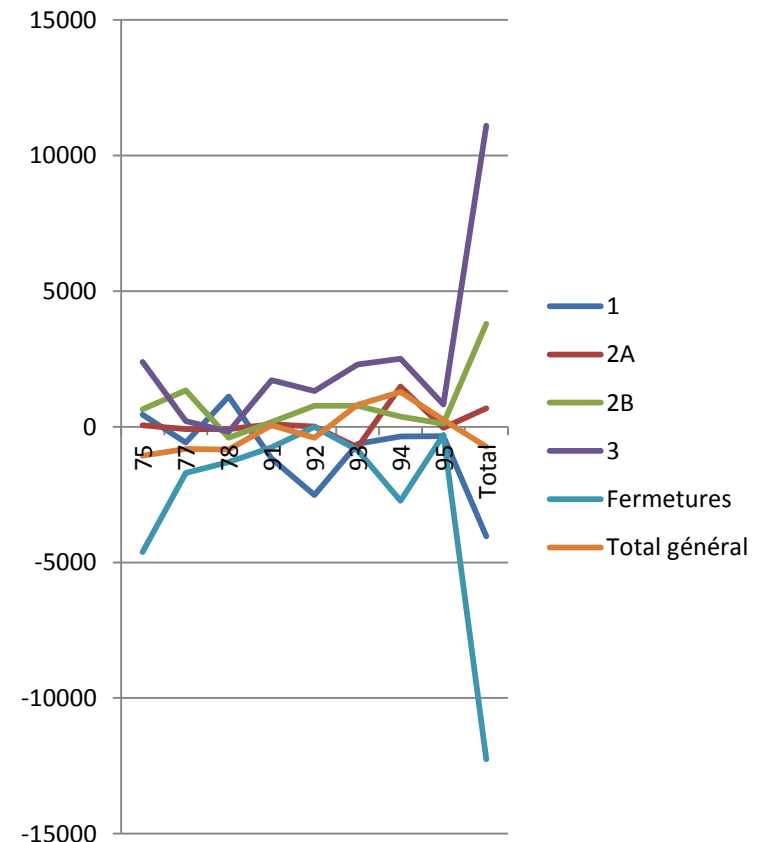
Perinat ARS IDF

INSEE (Census data)

D measure : Deliveries volume evolution in IDF 2015 vs 2009 /maternity type

Deliveries nb 2015 vs 2009	Districts								
	75	77	78	91	92	93	94	95	Total
By type									
1	447	-581	1122	-1173	-2514	-627	-361	-349	-4036
2A	56	-87	-82	87	12	-762	1490	-33	681
2B	646	1348	-406	172	778	771	373	111	3793
3	2397	209	-176	1720	1315	2298	2509	823	11095
Closures	-4614	-1702	-1300	-752	0	-869	-2732	-293	-12262
Total	-1068	-813	-842	54	-409	811	1279	259	-729

Type I: maternity only
 Type IIA: + neonatal care
 Type IIB: + NN intensive care
 Type III: + NN resuscitation (NICU)



C measure: Premature living births /place of residence

	2011		2012		2013		2014		2015	
	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%
<28 SA	546	0,3	576	0,3	583	0,3	600	0,3	674	0,4
28 - 32 SA	1993	1,1	1901	1,1	1900	1,1	1899	1,0	2015	1,1
33 - 36 SA	9863	5,5	10233	5,8	9973	5,7	10406	5,7	10466	5,8
Total preterm	12402	6,9	12710	7,2	12456	7,1	12905	7,1	13155	7,3

	2011		2012		2013		2014		2015	
	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%
< 37 SA										
75	1919	6,4	1927	6,8	1899	6,7	1989	6,7	1944	6,8
77	1352	6,9	1386	7,2	1413	7,4	1472	7,6	1451	7,5
78	1282	6,5	1268	6,5	1327	7	1321	6,8	1344	7,0
91	1295	7,1	1407	7,7	1307	7,1	1406	7,5	1464	7,8
92	1675	6,8	1671	6,9	1568	6,5	1624	6,6	1638	6,7
93	2113	7,5	2154	7,7	2126	7,6	2145	7,3	2226	7,7
94	1436	7	1560	7,7	1481	7,4	1524	7,2	1599	7,6
95	1330	6,9	1337	7	1335	7	1424	7,3	1490	7,7
Total IDF	12402	6,9	12710	7,2	12456	7,1	12905	7,1	13155	7,3

C measure: Neonatal mortality/ place of residence

Neonatal mortality

Place of birth not adequate for premature babies

	2012		2013		2014	
	nb	tx (‰)	nb	tx (‰)	nb	tx (‰)
75	62	2,1	90	3,1	63	2,2
77	45	2,3	43	2,2	50	2,5
78	48	2,4	52	2,6	33	1,7
91	44	2,4	47	2,5	45	2,4
92	52	2,1	68	2,8	52	2,1
93	106	3,7	99	3,5	102	3,5
94	55	2,6	54	2,6	53	2,5
95	45	2,3	60	3,1	47	2,4
IDF	457	2,5	513	2,8	445	2,4

	2012		2013		2014	
	nb	tx	nb	tx	nb	tx
75	153	13,2	127	10,6	154	12,3
77	98	11,2	93	10,7	117	12,7
78	86	10,5	82	9,9	74	9,1
91	119	13,0	100	11,8	104	11,7
92	125	11,8	103	9,8	97	9,7
93	135	9,6	126	8,9	152	11,0
94	122	12,0	114	11,7	91	9,3
95	95	11,2	53	6,2	98	10,9
IDF	933	11,5	798	9,9	887	10,9



Discussion- 1

1 / Regional perinatal health plan assessment

Relevant indicators of public actions for health impact assessment and cost impact?

The best way to measure them?

Health impact assessment is now promoted to reduce social inequalities in health but has not been systematically used in the previous plan...

How to take into account real life (ex availability of paediatric or anesthetist staff) and population needs out of center area?



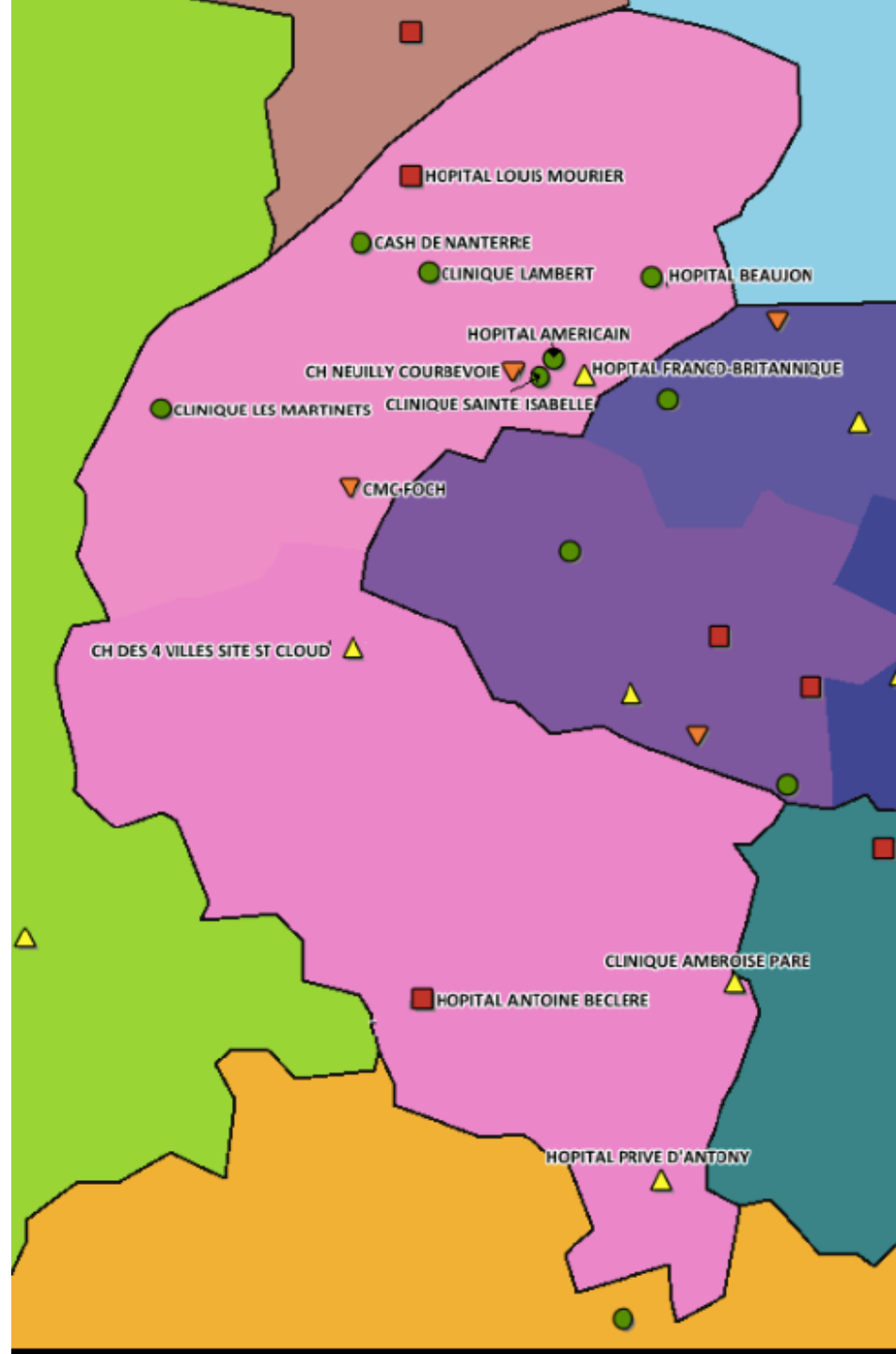
Results - 2

2 /Perinatal activities authorizations plan
Activity, capacity, staff: efficiency? safety?

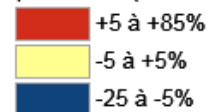
Case study in Hauts de Seine (« 92 » district)

12 maternity hospitals:

Declarative files // hospital discharge data

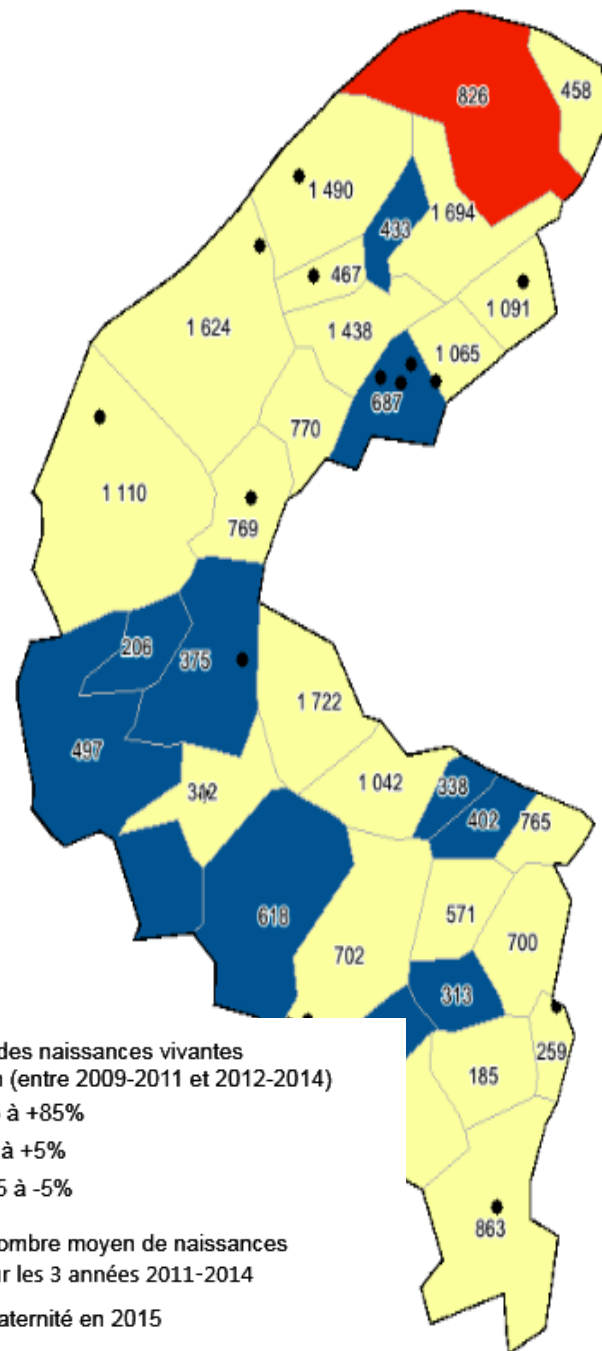


Evolution des naissances vivantes par canton (entre 2009-2011 et 2012-2014)

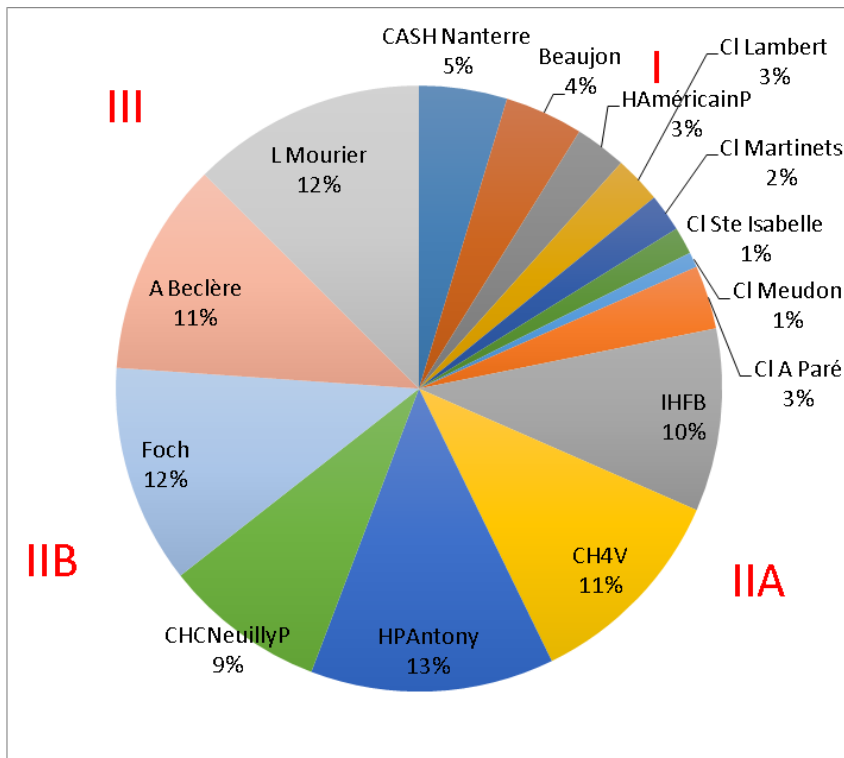


232 Nombre moyen de naissances sur les 3 années 2011-2014

● Maternité en 2015



Deliveries distribution / maternity type in 92 district (Hospital discharge summary 2015)

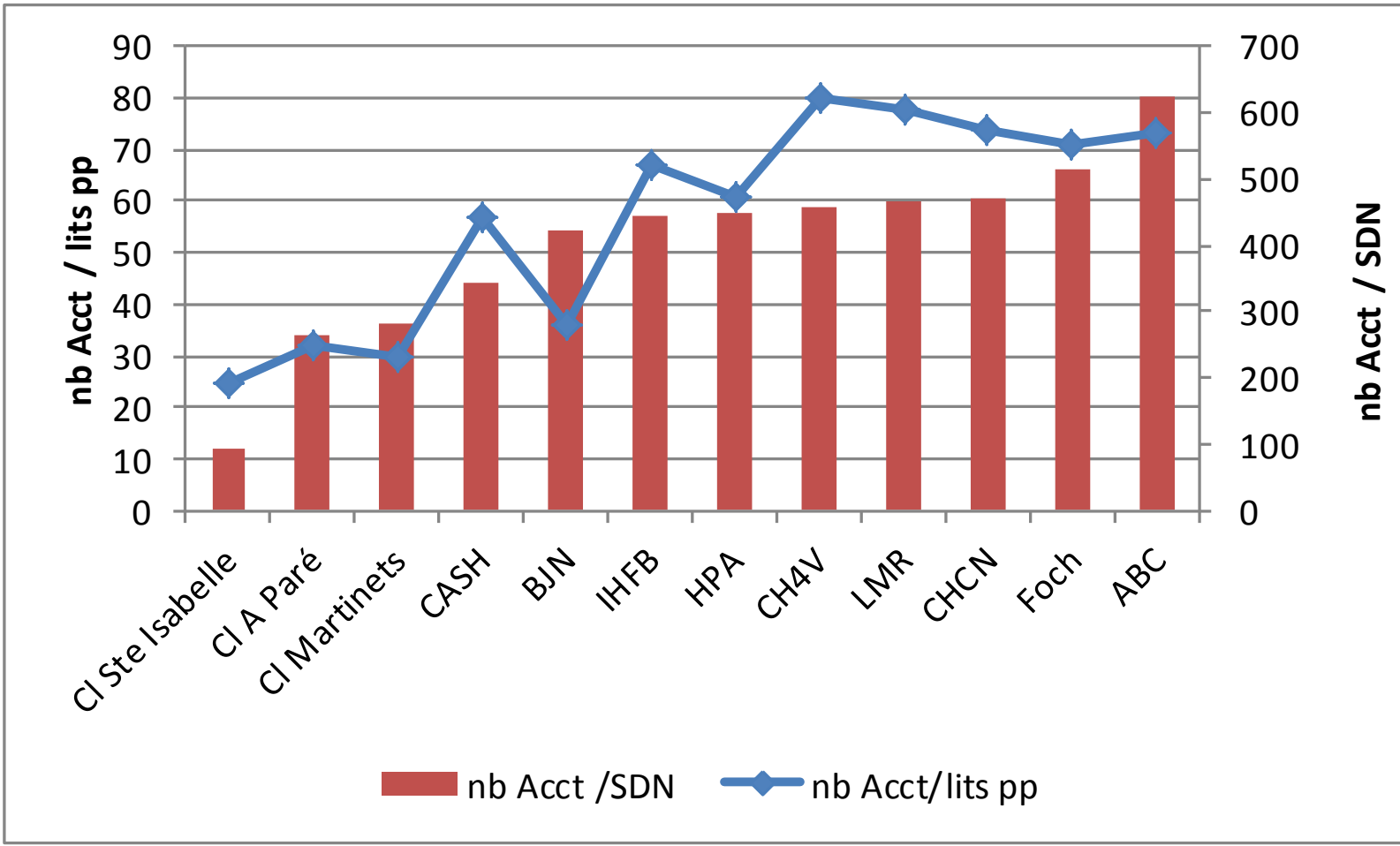


Type	92 2014	92 2015	IDF 2015
I	21%	22%	17%
IIA	36%	34%	27%
IIB	20%	21%	24%
III	23%	23%	32%

27115 registered deliveries in the district
maternities (15%/ IDF)



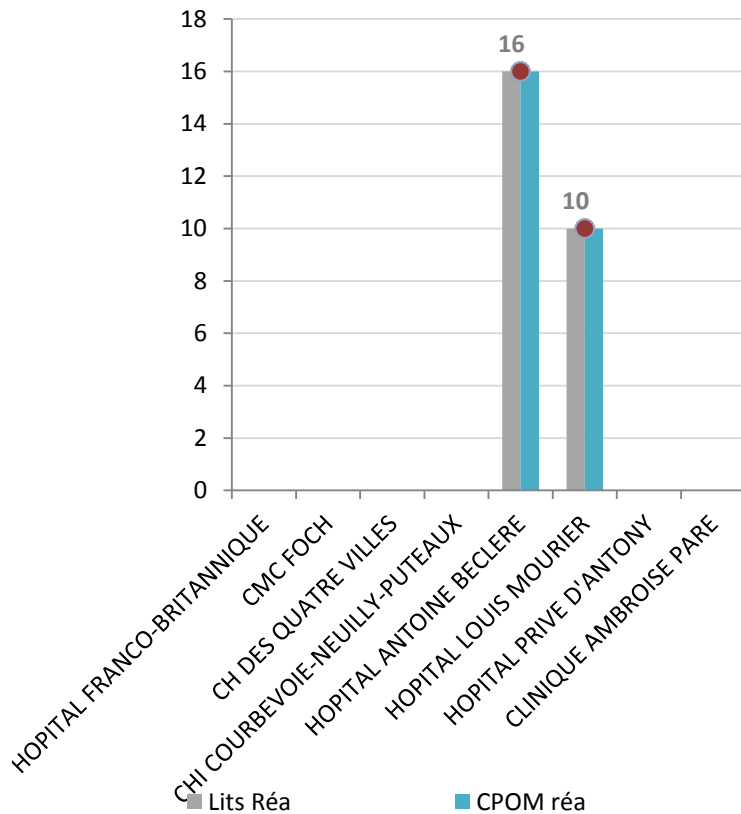
Ratios deliveries (Acc) / delivery ward (SDN) et postpartum beds (pp)



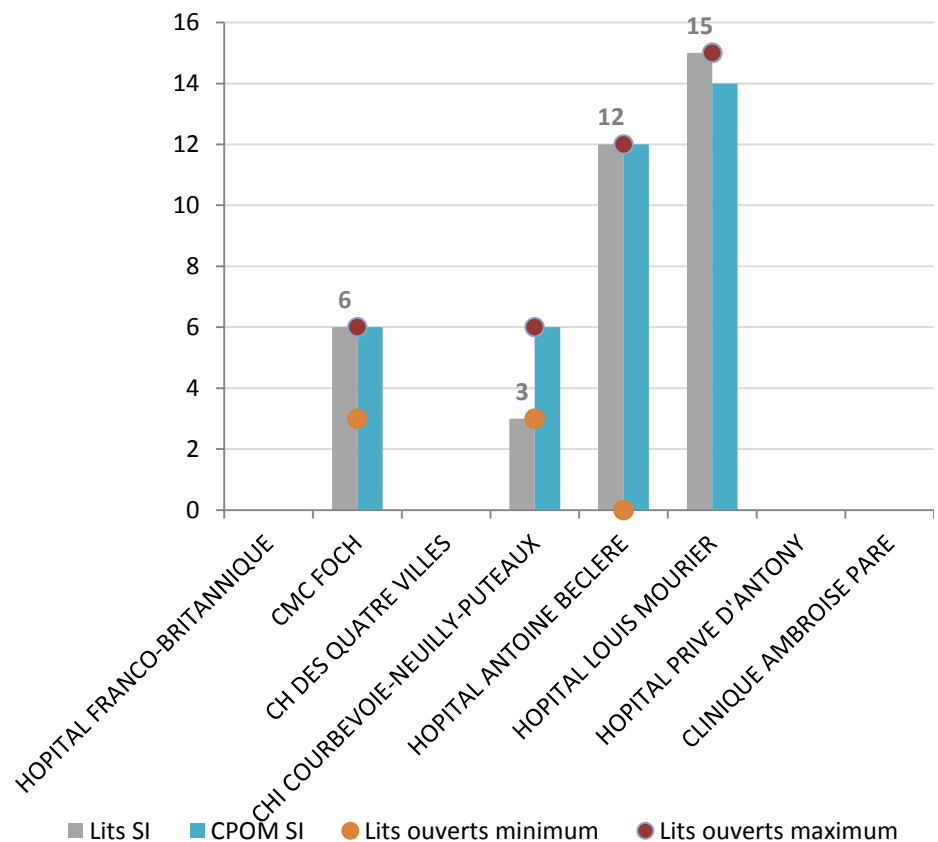
Declarative data from maternities survey 2015 in 92 district

« Settled » and « Authorized » beds with maximum and minimum (hospital declarations in 2016) (1)

Neonatal Resuscitation

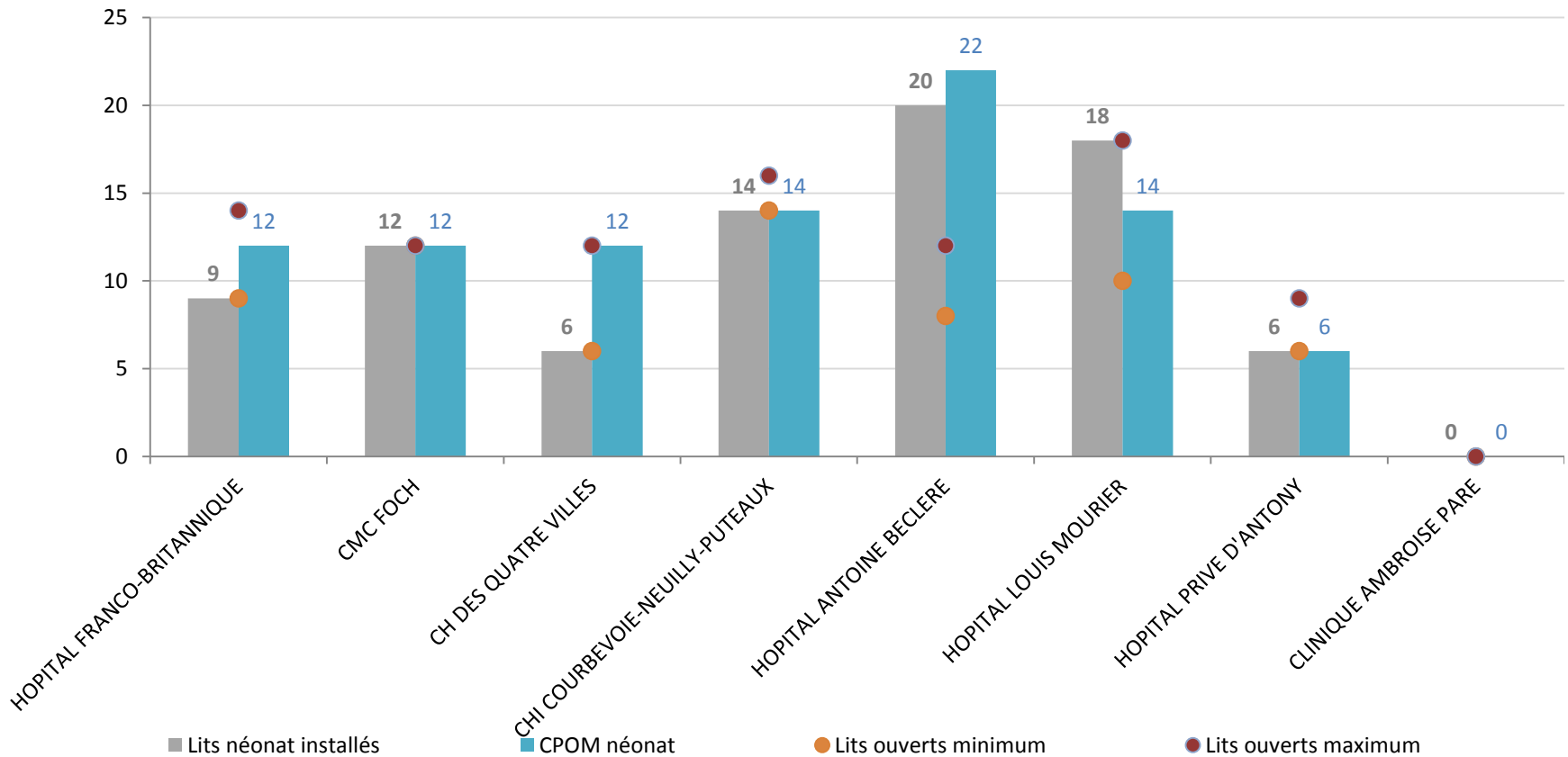


Neonatal Intensive care

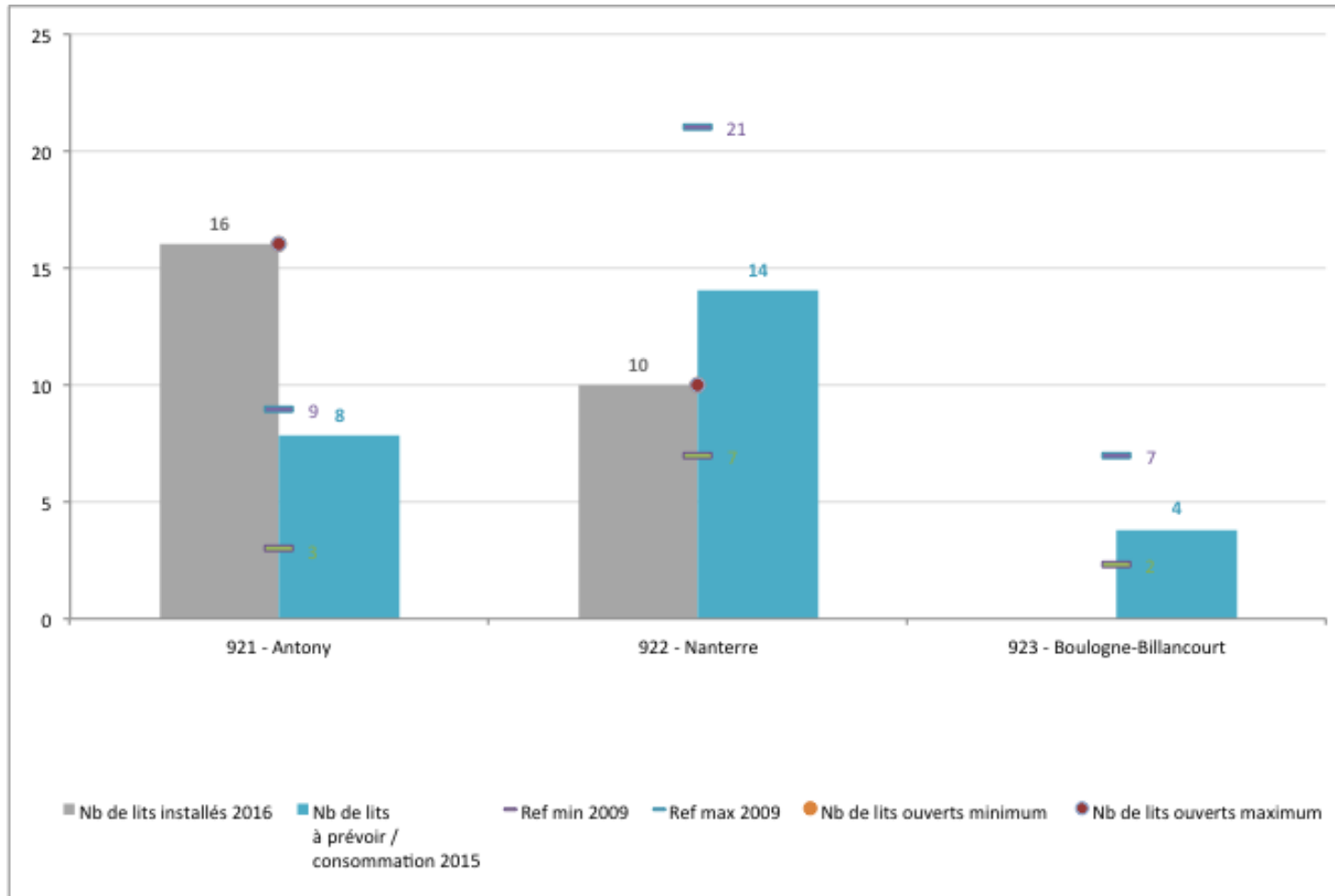


« Settled » and « Authorized » beds with maximum and minimum (hospital declarations in 2016) (2)

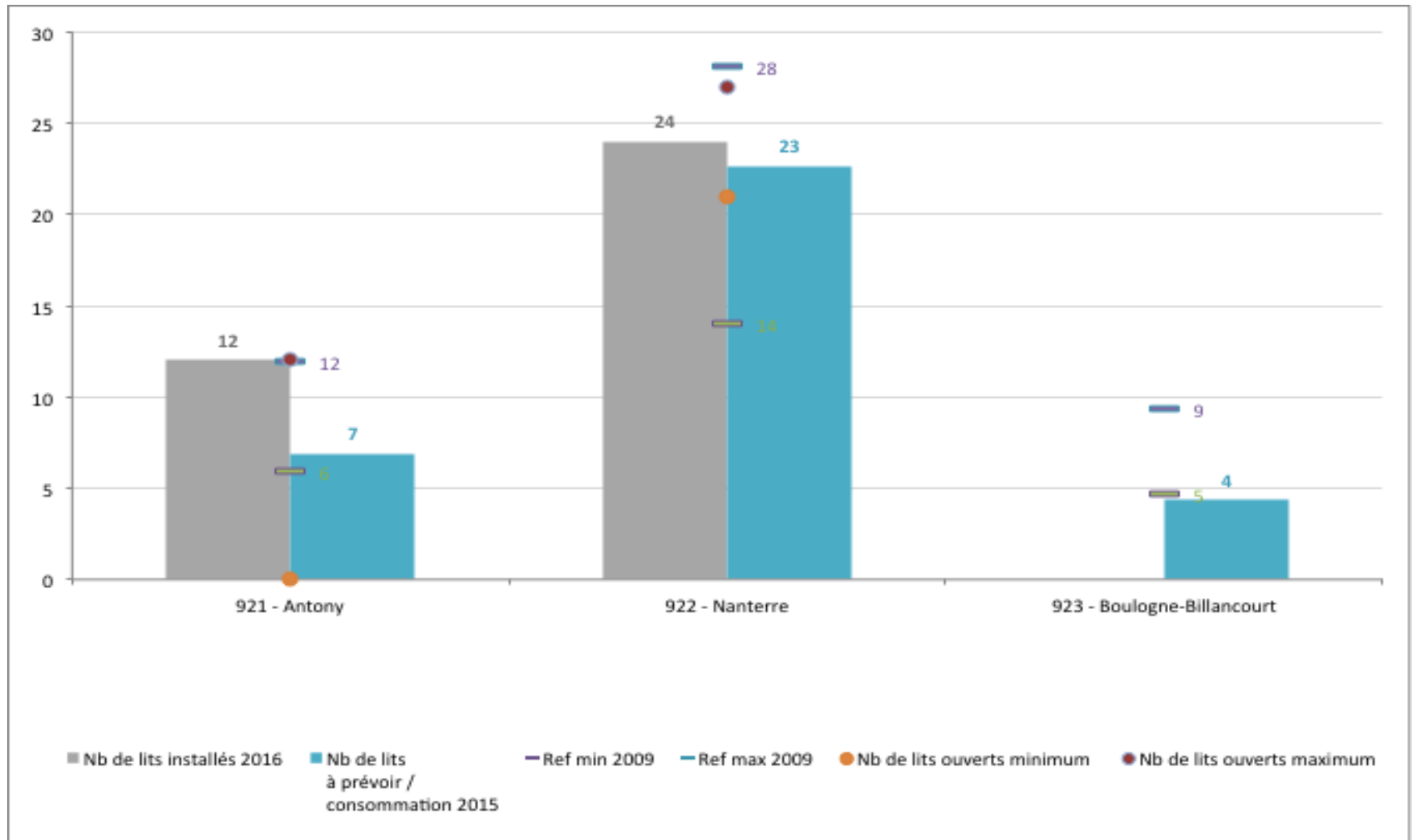
Neonatal care



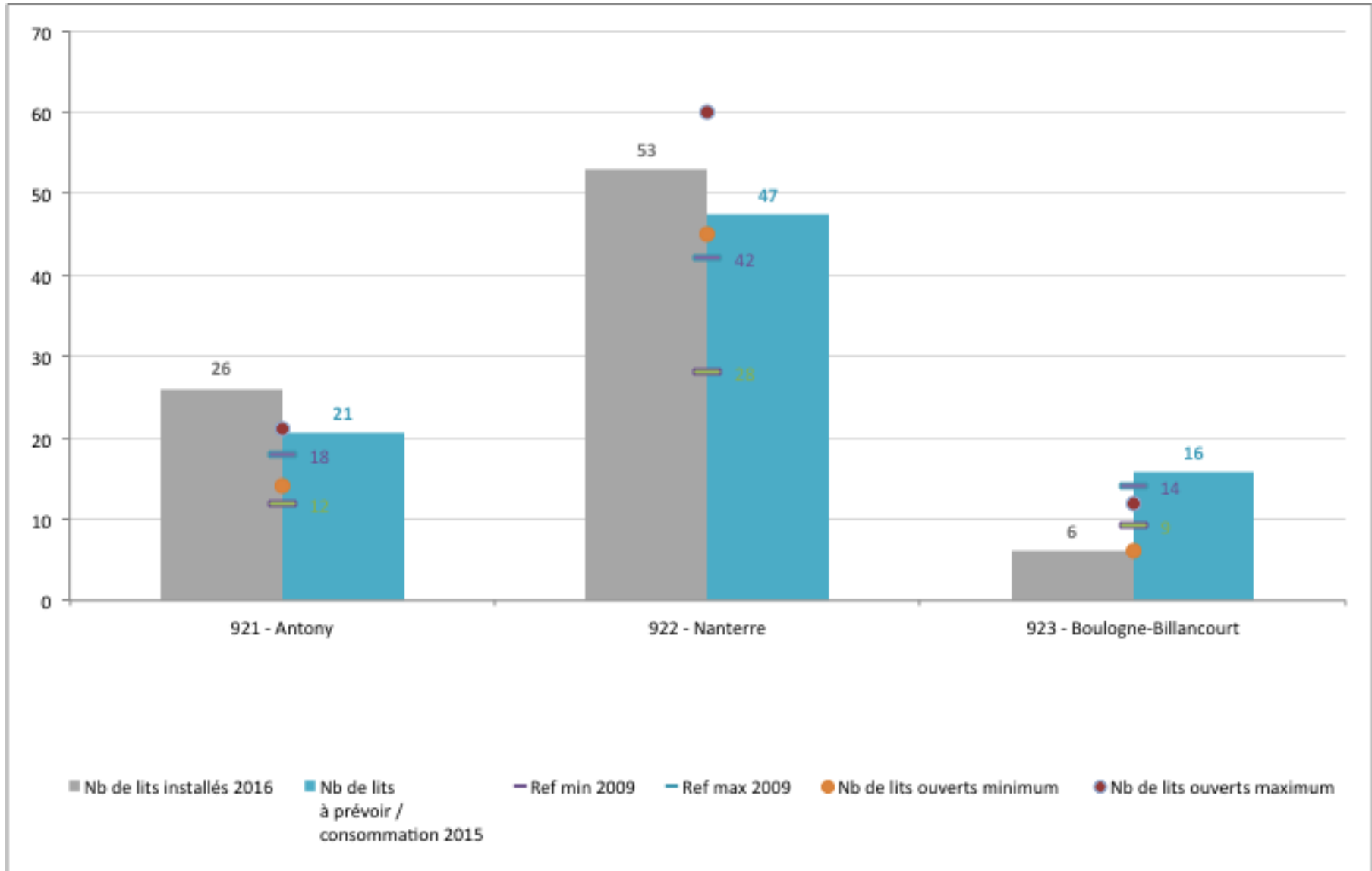
Resuscitation beds forecasting / place of residence births and occupancy rate in 2015



Neonatal Intensive care beds forecasting / place of residence births and occupancy rate in 2015



Neonatal care beds forecasting / place of residence births and occupancy rate in 2015





Discussion- 2

2 /Perinatal activities authorizations plan

3 maternities are closed since 2015

Pb with data meanings in neonatal care:

- for bed occupancy (settled/authorized, ..)

- severity of patient in resuscitation/intensive care: varies from an hospital to another

Rules to define needs have to be reviewed (2009): NNbeds /nb births

How to take into account lower availability of staff (paediatrician, anesthesist, ...) in area where population needs are higher?

Discussion- 2

2 /Perinatal activities plan and previous work

- Dynamic Capacity planning and location of hierarchical service networks under Service Level Constraint. C. Pehlivan, V. Augusto, Xiaolan Xie; <http://ieeexplore.ieee.org> 2014
- Design and flow control of a stochastic healthcare network without waiting rooms. A perinatal application. Thesis C Pehlivan. Ecole des Mines de St Etienne- 23/1/2014

**We hope to collaborate again with OR team
with up-to date data**



Results- 3

3/ Healthcare pathways and perinatal networks

« Shared territorial diagnosis »: Global perinatal pathway

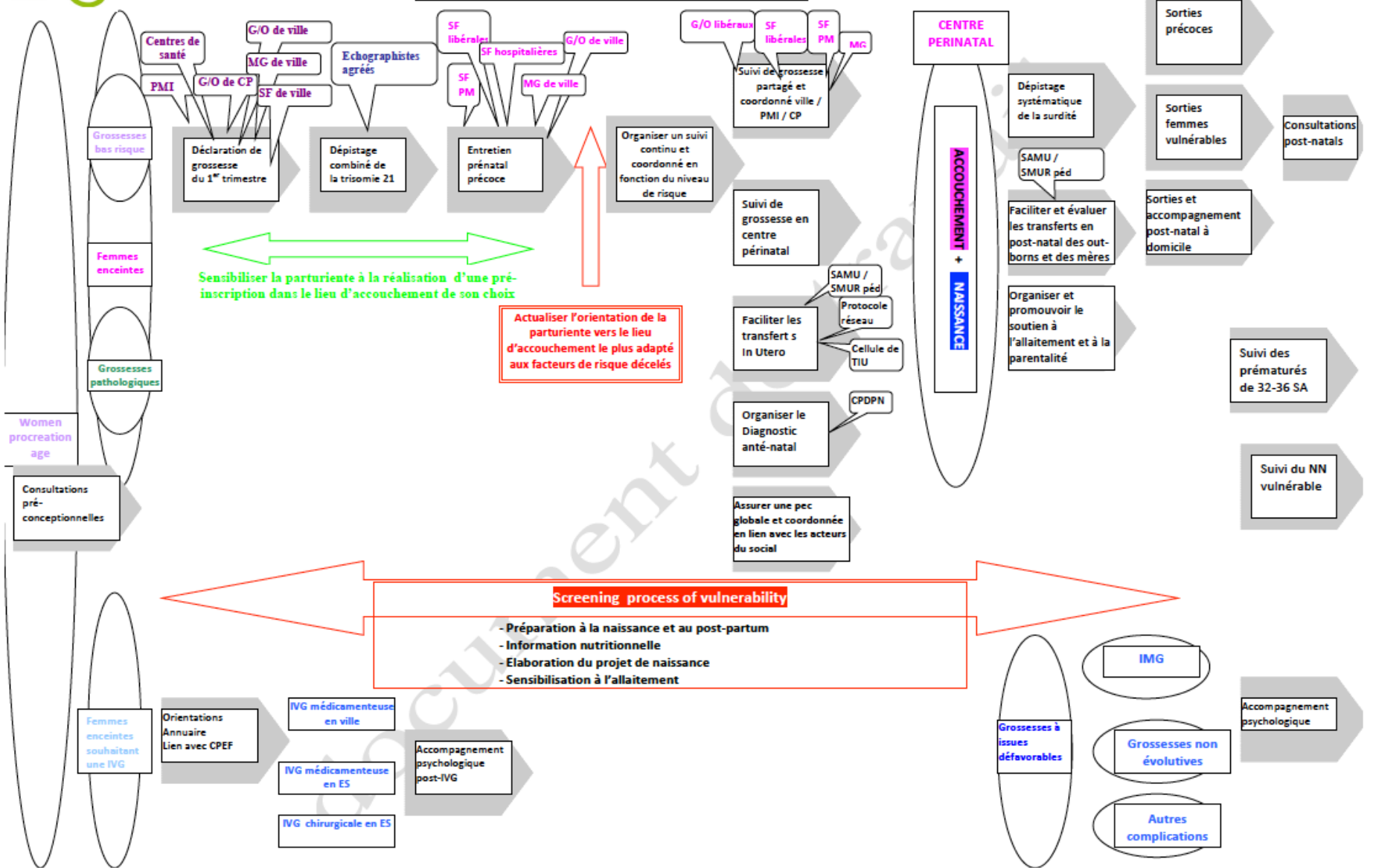
Case study in Hauts de Seine (« 92 » district):

34793 childbearing women, 24469 births /92 district

Hospital survey and discharge data

Private midwives Survey : 96 responses /127

Perinatal pathway



Sensibiliser la parturiente à la réalisation d'une pré-inscription dans le lieu d'accouchement de son choix

Actualiser l'orientation de la parturiente vers le lieu d'accouchement le plus adapté aux facteurs de risque décelés

Screening process of vulnerability

- Préparation à la naissance et au post-partum
- Information nutritionnelle
- Elaboration du projet de naissance
- Sensibilisation à l'allaitement

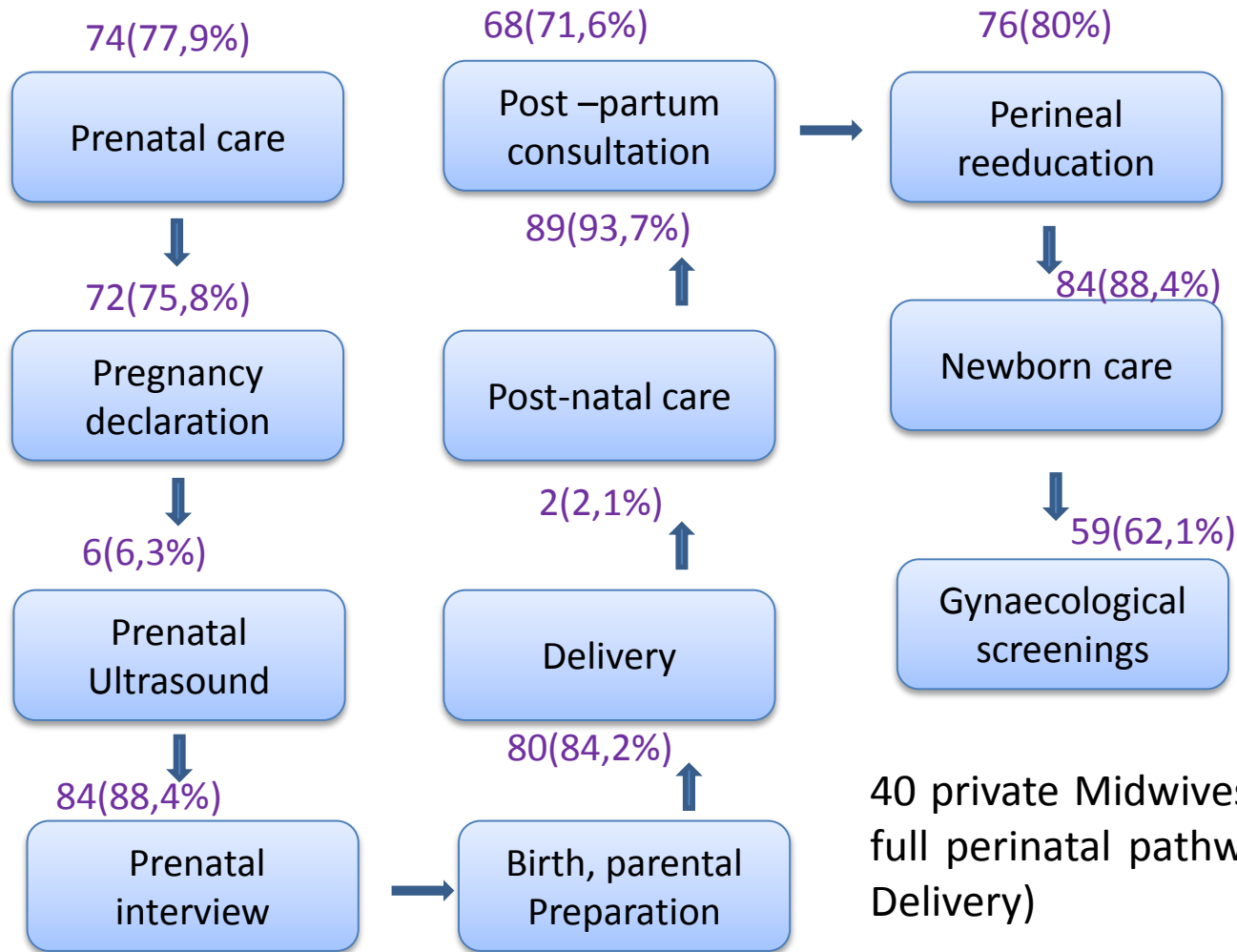
Grossesses à issues défavorables

- IMG
- Grossesses non évolutives
- Autres complications

Accompagnement psychologique

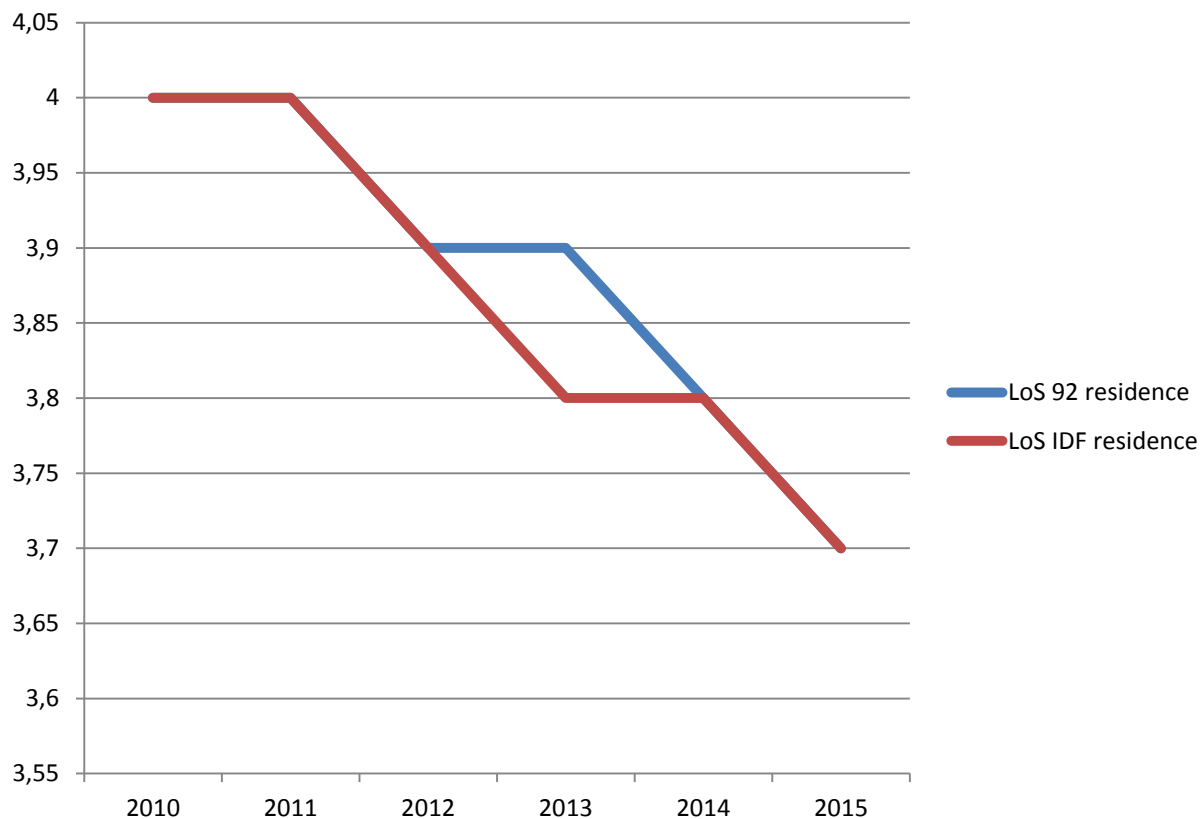
Procedures done by private midwives (Declarative data , 2016 Survey in 92)

Perinatal pathway



40 private Midwives (42%) practice in a nearly full perinatal pathway (except Ultrasound and Delivery)

Hospital Length of Stay (postpartum)



Post natal care at home by private midwives since 2013- 2014 in IDF 12 maternities do in 92 dept in 2015 (hospital survey)



Discussion- 3

3/ Healthcare pathways and perinatal networks

How to describe different components?

Which indicators for the total pathway?

How to measure a network impact?

Conclusion

A lot of questions for be further explored with
methodologists help?

THANK YOU!

catherine.crenn-hebert@aphp.fr

www.perinat-ars-idf.org