Maternal Mortality surveillance in France

Improving knowledge for Improved prevention

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Perinatal context in France

- ~ 530 maternity units
- ~ 800 000 deliveries /year
- 28% in private hospitals
- 21% by caesarean
- Maternal mortality ~10/100 000

Why a specific surveillance system for maternal mortality ?

- **Still an essential indicator of maternal health, even in high resource countries**
  - "Sentinel event"
  - Easier to define and measure than maternal morbid events

- **Need for an <u>enhanced</u> system**
  - Pitfalls of death statistics
    - Underreporting of MD, underestimation of MMR
    - Combination of false negatives *and* false positives, inaccurate profile of causes of death
  - Double objective: epidemiological (quantitative) AND clinical/care improvement (~ qualitative)

A specific procedure in France:
The National Confidential Enquiry into maternal deaths with Expert Committee

- Since 1996
- Under the responsability of the National Institute for Public health surveillance (governmental agency)
- Funded by the Ministry of health and INSERM (National institute for health and medical research)
- Coordinated by INSERM research team

A 3 step procedure

1. Identification of deaths« associated with pregnancy »

Up to 1 year of pregnancy end

. Death certificate/check box

. Ó2007Linkage of birth and death certificates
Hospital discharge database

. Ó2009 Direct notification (voluntary)

2. Documentation of deaths= Confidential Enquiry

. On site visit

. 1 ObGyn + 1 Anesth/Intensive care,
(voluntary, unpaid)

3. Review and classification of deaths: National Committee of Experts

. Cause of death

. Adequacy of care

. Avoidability of death

Maternal Deaths

National experts committee

- Members, private & public, various levels of care, approved by national professional bodies
  - 17permanent
    - 6 ObGyn
    - 2 Midwives
    - 5 Anesth/intensive care specialists
    - 1 internal medicine specialist
    - 3 epidemiologists
  - + 2 associated experts
    - 1 Pathologist
    - 1 neurologist
- 6 plenary sessions /year
- Anonymous review
- 4 triennal reports since beginning

Persistent barriers for an optimal system

- Poor Public Health culture
- Reluctance of clinicians to notify MD and provide information on critical events, more particularly in private sector
- Evaluation still perceived more as a risk of blame than an opportunity for improvement
- Delay between occurrence of deaths and data collection and treatment
- Insufficient diffusion of results and reports

Les Morts Maternelles en France

Mieux comprendre pour mieux prévenir

Available on line
(in French ☹)

Rapport du
Comité National d'experts sur la Mortalité Maternelle
2007-2009

Enquête nationale confidentielle sur les morts maternelles

Instituts thématiques

Inserm

Institut national de la santé et de la recherche médicale

Unité 953.
Recherche épidémiologique en santé périnatale, santé des femmes et des enfants

Stability of Maternal mortality ratio

ENCMM					Official Statistics		
	LB (N)	MD (n)	MMR (/100 000 LB)	95%CI	MD (n)	MMR (/100 000 NV)	95%CI
2007-2009	2 472 650	254	**10,3**	**(9,1-11,7)**	210	8,5	(7,4-9,7)
2001-2006	4 829 866	463	**9,6**	**(7,5-10,0)**			

Å ~85 maternal deaths/year in France, ~1 case/ 4-5 days

Å MMR stable over the last 10 years, around 10/100 000 LB

Å Current under-estimation in official death statistics: ~20%

Subgroups at risk

Å Older women

Age	LB	MD (n)	*MD (%)*	MMR (/10^5lb)	95%CI
<20	50 601	9	*4*	**17,8***	**(8,1-33,8)**
20-24	337 395	21	*8*	6,2	(3,9-9,5)
25-29	782 730	51	*20*	6,5	(4,9-8,6)
30-34	775 465	72	*28*	9,3	(7,3-11,7)
35-39	421 672	68	*27*	**16,1***	**(12,5-20,4)**
40-44	98 886	31	*12*	**31,3***	**(21,3-44,5)**
45 et+	5 901	3	*1*	**50,8***	**(10,5-148,5)**
Tous	2 472 650	254	*100*	10,3	(9,1-11,7)

Å Migrant women

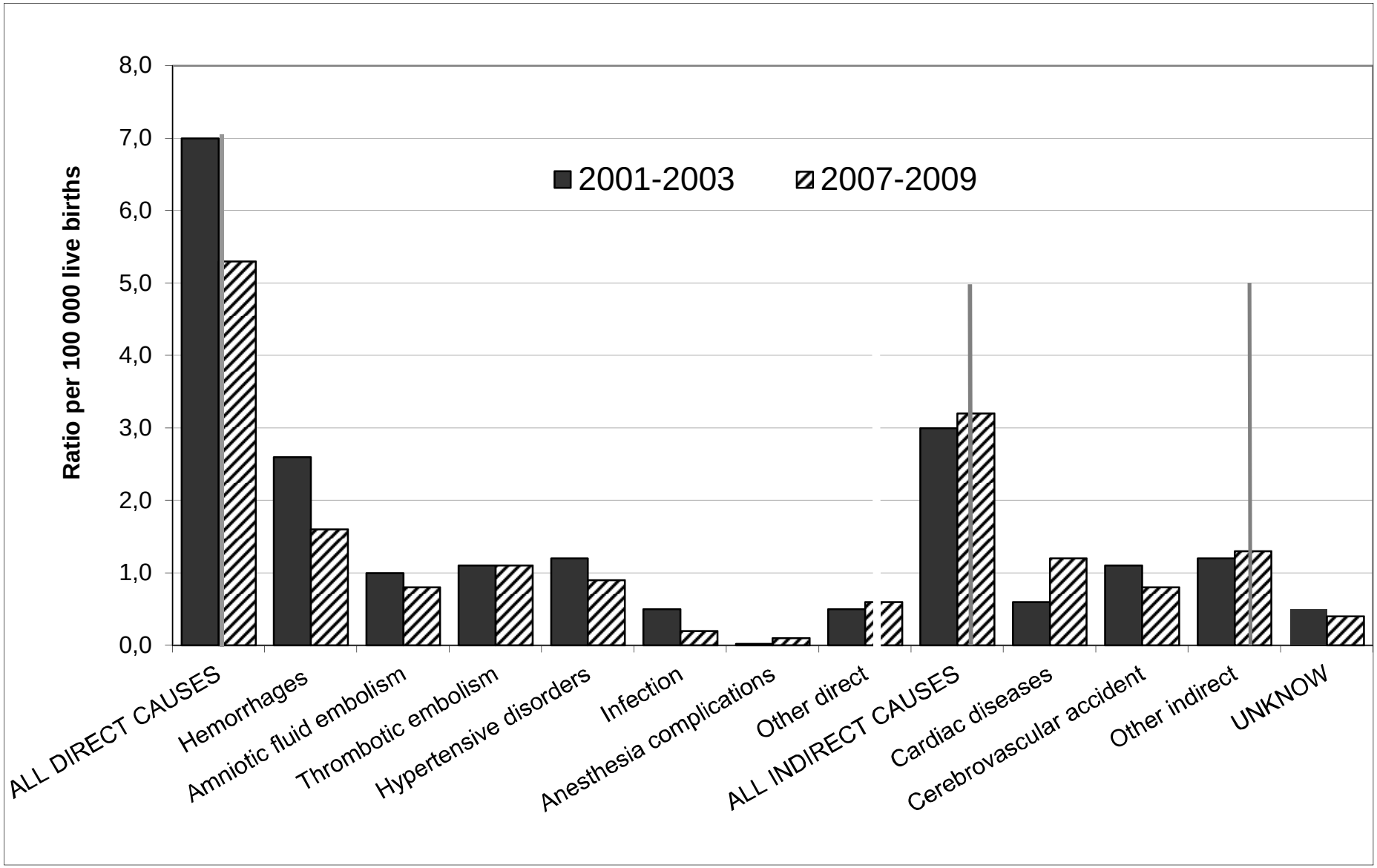
	MD (n)	*MD (%)*	MMR (/10^5NV)	95%CI
French	200	*80*	9,3	(8,1-10,7)
Other European	5	*2*	9,5	(3,1-22,2)
North Africa	16	*7*	14,5	(8,3-23,5)
Subsaharian Africa	15	*6*	**21,0***	**(11,8-34,7)**
Others	13	*5*	15,4	(8,2-26,4)
ALL	254	*100*	10,3	(9,1-11,7)

Å Women with multiple pregnancy

	MD (n)	*MD (%)*	MMR (/10^5NV)	95%CI
Singleton	240	*95*	10,0	(8,8-11,3)
Multiple	14	*5*	**35,3**	**(19,3-59,0)***

Causes of maternal deaths, 2007-2009

	n	%
Direct	**148**	***58***
Hemorrhage	46	*18*
Thrombo-embolism	31	*12*
Hypertensive disorders	23	*9*
AFE	20	*8*
Infection	8	*3*
Complication of anesthesia	3	*1*
Other direct	17	*7*
Indirect	**95**	***38***
Cardiac disease	35	*14*
Cerebro-vascular accident	23	*9*
Other	37	*15*
Unknown	**11**	***4***
ALL	254	*100*


Ratio per 100 000 live births
8,0
7,0
6,0
5,0
4,0
3,0
2,0
1,0
0,0
2001-2003
2007-2009
ALL DIRECT CAUSES
Hemorrhages
Amniotic fluid embolism
Thrombotic embolism
Hypertensive disorders
Infection
Anesthesia complications
Other direct
ALL INDIRECT CAUSES
Cardiac diseases
Cerebrovascular accident
Other indirect
UNKNOW

Adequacy of care

judgment possible for ¾ of cases

	1998-2000	2007-2009
	% with inadequate care	% with inadequate care
All causes	**72**	**59***
Hemorrhage	87	81
Thrombo-embolism	60	42
Hypertensive disorder	81	71
AFE	33	50
Infection	83	86
Indirect causes	71	52

Judged separately for

- Preconceptional care
- Antenatal care
- Obstetric care
- Anesthetist/intensive care

Avoidability of deaths

	1998-2000	2007-2009
	Certainly/ possibly avoidable (%)	Certainly/ possibly avoidable (%)
All causes	**50**	**53**
Hemorrhage	86	83
Thrombo-embolism	27	53
Hypertensive disorder	75	62
AFE	0	31
Infection	71	67
Indirect causes	35	46

Avoidable factors, related to:

- Patient
- Provider
- Organisation of care

Focus on
Maternal mortality due to haemorrhage

First CEMD report

- showed
  - the **particular magnitude** of maternal mortality due to hemorrhage in France, as compared to other high-resource countries
  - and a high prevalence of **inadequate care** in this subgroup

- Triggered the development of the first **national guidelines** for postpartum hemorrhage management in 2004, and a general effort to **evaluate and improve** the adequacy of care for PPH

	2001-2003	2004-2006	2007-2009	*P*
MM due to Obstetric hemorrhage				
N	54	45	37	
% of all MD	22%	21%	17%	
Mortality Ratio	**2.3**	**1.8**	**1.5**	**0.03**
MM due to atonic PPH				
N	28	33	19	
Mortality Ratio	**1.2**	**1.3**	**0.8**	**0.05**

= 1/3 decrease in maternal mortality due to obstetric hemorrhage, and more particularly atonic PPH, in France over the last decade

- Suggests improvement in the management of obstetric hemorrhage
- Illustrates the contribution of CEMD for signaling specific problems and advancing medical practices
- and the importance of having an enhanced system for studying maternal mortality at national level

Better but……..Improvement still possible

Å > 80% deaths: avoidable, substandard care

Å Comparison with other countries

	United-Kingdom 2006-2008	France 2007-2009
All MD (n)	261	254
Direct MM (MMR/100 000)	4.7	5.3
Maternal deaths due to obstetric haemorrhage		
N (% of direct MM)	9 (8%)	39 (27%)
MMR (/100 000)	0.4	1.6
Maternal deaths due to atonic PPH		
N (% of direct MM)	2 (2%)	21 (14%)
MMR (/100 000)	0.1	0.8

Main lessons learned from the enhanced surveillance of MM in France

- Frequency stable, ~ European ratio
- Some encouraging findings over the last 10 years
  - ↓ of direct MM
  - ↓ of MM due to PPH
  - ↓ of % of inadequate care
- But
  - Improvement still possible for MM due to hemorrhage
  - Increasing importance of deaths due to preexisting conditions, in particular cardiac diseases
  - Large part of deaths with inadequate/improvable care

  → 20 key messages , general and related to specific conditions
  - Persistent social and geographic disparities
- Importance of maternal mortality studyé ..to be complemented by study of severe morbid events

Besides surveillance and clinical messages,
use of MM data to **explore research questions**

Examples

- Maternal mortality associated with cesarean delivery
- Mechanisms of excess MM among migrant women
- Regional differences in maternal mortality

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