



**MISSING INFORMATION IN BIRTH
CERTIFICATE DATA IN BRUSSELS**



WHAT'S THE PROBLEM

- Birth certificates= information for caregivers and policy makers
- Missing data
- Missing data repeatedly found in some circumstances
 - representativeness?
- Unreported stillbirths
 - $\geq 500\text{g}$ or ≥ 22 weeks from 1991



CENTRE D'ÉPIDÉMIOLOGIE PÉRINATALE

- Created in Sept 2007
- To assist the Health Departments of Brussels-Capital City Region and of the French Community
- To gather and check birth certificates



CENTRE D'ÉPIDÉMIOLOGIE PÉRINATALE

- Monthly visual check of all encoded certificates
- Incorrect or missing information returned
- Global and individual report

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○ 2008

- Postal reminders to all gynecologists and midwives
- Postal reminders to all city officers
- Chief-midwives met 1x/month

○ 2009

- No reinforcement rules



OBJECTIVE

Changes brought by the Centre:

- 1) Return rate
- 2) Completeness of data registration
 - In terms of missing data
 - In terms of stillbirths registration
- 3) Missing data according to maternal origin



METHODS

- Initial missing information
 - January 2008 (baseline situation)
 - December 2008
 - Oral and written information
 - December 2009
 - No reinforcement rules
- Residual missing data at the end of 2008 and 2009 after correction
- Stillbirths registration
 - Before 2008 (baseline situation)
 - In 2008
 - In 2009



RESULTS:

1) Initial missing information

- January 2008: **64.0%** of all certificates
- December 2008: **20.8%**
- December 2009: **19.5%** (p -value=0.22)



RETURN RATE



RESULTS:

2) Residual missing data

- at the end of 2008: **2.1%**
- and 2009: **0.8%** (p -value <0.001)



RESULTS:

2) missing data

Variable	% missing data in 2008 (N=23375)	% missing data in 2009 (N=24157)
Date of birth	0.00	0.00
Sex	0.02	0.00
Plurality and birth order	0.00	0.00
Presentation	0.44	0.19
Induction	0.22	0.09
Mode of delivery	0.00	0.12
Gestational age	0.28	0.28
Birthweight	0.18	0.24
Respiratory assistance	15.50	0.37
1 minute Apgar score	0.26	0.35
5 minute Apgar score	0.27	0.36
Transfer to NICU	15.50	0.94
Parity	0.74	0.12
Date of the last delivery	10.15	10.54
Hypertension	0.00	0.00
Diabetes	0.00	0.00
Birth defect	0.03	0.26
Place of delivery	0.00	0.00
Type of maternity	0.00	0.00



RESIDUAL MISSING DATA

Date of marriage	0.40	0.12
Residence	0.09	0.00
Father characteristics		
Birth date	1.18	0.71
educational level	7.57	5.63
Employment status	1.96	1.37
Type of work	1.88	1.42
Original nationality	10.70	0.77
Present nationality	1.44	0.74



RESULTS:

3) Missing data according to origin

% missing data

Variable	Belgian	UE15	Maghreb	Sub-Saharan Africa	Eastern Europe	Turkey	South-East Asia
Transfer to NICU	1.03	0.81	0.79	1.07	0.93	0.82	1.19
Date of the last delivery	8.12	10.87	10.71	13.02	12.35	14.38	10.32
Educational level	3.81	4.88	8.09	9.83	9.44	6.65	7.85
Employment status	0.52	0.90	0.98	1.32	1.19	0.72	0.51
Type of work	0.75	1.26	1.56	1.84	1.50	1.02	1.54
Father characteristics							
Birth date	0.67	0.44	0.45	1.64	0.88	0.32	1.24
educational level	4.36	4.36	6.64	7.91	6.69	5.99	7.10
Employment status	1.15	1.07	1.21	2.49	1.56	0.95	1.42
Type of work	1.22	1.14	1.03	3.04	1.71	0.84	1.78
Original nationality	0.77	0.44	0.47	1.64	1.03	0.32	1.07
Present nationality	0.73	0.44	0.49	1.59	0.93	0.32	1.24

RESULTS:

4) Stillbirths registration

- Before 2008: **4.7 ‰ (110/23170)**
 - **22.8% < 28 weeks**
- In 2008: **8.4 ‰ (197/23572)**

-  **↑ REGISTRATION**



DISCUSSION: MISSING DATA IN IMMIGRANT SUBGROUPS

↓ Last menstrual period in North African mothers

Buekens P, Delvoye P, Wollast E, Robyn C: **Epidemiology of pregnancies with unknown last menstrual period.** *Journal of epidemiology and community health* 1984, **38(1):79-80.**

↓ adverse birth outcomes, risk factors, obstetrical procedures if non-English language

Reichman NE, Schwartz-Soicher O: **Accuracy of birth certificate data by risk factors and outcomes: analysis of data from New Jersey.** *American journal of obstetrics and gynecology* 2007, **197(1):32 e31-38.**

→ bias introduced if missing data not evenly distributed between groups with different risks of complications



DISCUSSION: QUALITY IMPROVEMENT

1) Return rate ↓ Electronic systems

Starr P, Starr S: **Reinventing vital statistics. The impact of changes in information technology, welfare policy, and health care.** *Public Health Rep* 1995, **110**(5):534-544.

2) Missing data ↓ Feedback to hospitals

Northam S, Knapp TR: **The reliability and validity of birth certificates.** *J Obstet Gynecol Neonatal Nurs* 2006, **35**(1):3-12.



DISCUSSION: STILLBIRTHS REGISTRATION

↓ registration
knowledge
chances of survival
social and cultural

Gourbin G, Masuy-Stroobant G: **Registration of vital data: are live births and stillbirths comparable all over Europe?** *Bulletin of the World Health Organization* 1995, **73**(4):449-460.

Target?

2009: range : 4.7- 24.0‰ according to hospital



CONCLUSIONS

- Return rate ↓
- Residual missing data ↓
- Stillbirths ↑
- Variation social data according to maternal origin
 - BUT: low residual rate

