USING INTERNATIONAL POPULATION HEALTH DATA TO EXPLORE AN ALARMING INCREASE IN EXCESSIVE BLEEDING POST-CHILDBIRTH

JB Ford (1), CL Roberts (1), KS Joseph (2), WM Callaghan (3).
University of Sydney, Australia
University of British Columbia, Canada
Division of Reproductive Health, Centers for Disease Control and Prevention, USA

CLINICAL AND POPULATION PERINATAL HEALTH RESEARCH
KOLLING INSTITUTE OF MEDICAL RESEARCH

THE UNIVERSITY OF SYDNEY

KOLLING Institute of Medical Research

SCOPE

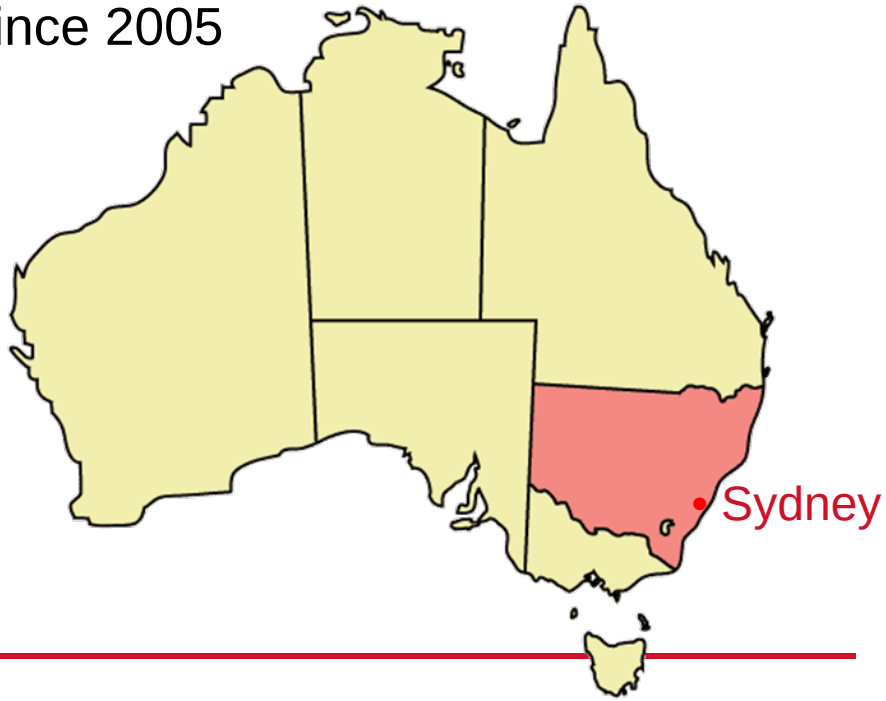
SCOPE OF THIS PRESENTATION

- Background
- Trends in excessive bleeding, New South Wales, Australia
- International Working Group on Postpartum Haemorrhage
- Other developing international collaborations

BACKGROUND

ABOUT US

- Research group that is part of the University of Sydney, located in a clinical setting
- Primarily project-based funding
- Conduct basic science, clinical trials and population health research
- Utilising linked population health data since 2005



BACKGROUND – LINKAGE

Core data sets (NSW)

Admitted Patients Data Collection
July 2000- June 2008
17,382,617 records

RBDM Birth registrations
1994-2008
1,333,539 records

RBDM Death Registrations
1994-June 2009
755,687 records

ABS Mortality Data
1985-2007
1,020,798 records

ABS Perinatal Mortality Data
1994-2005
9,445 records

Midwives Data Collection
1994-2008
1,331,115 records (mothers and babies)

Perinatal reviews
2000-2006
4,657 records

CHeReL
MASTER LINKAGE KEY

29.4 million records
7.14 million people

Core data sets (NSW)

Central Cancer Registry
1994-2007
466,534 records

The 45 and Up Study
2009
242,002 records

Emergency Department Data Collection
2005-2007
5,479,784 records

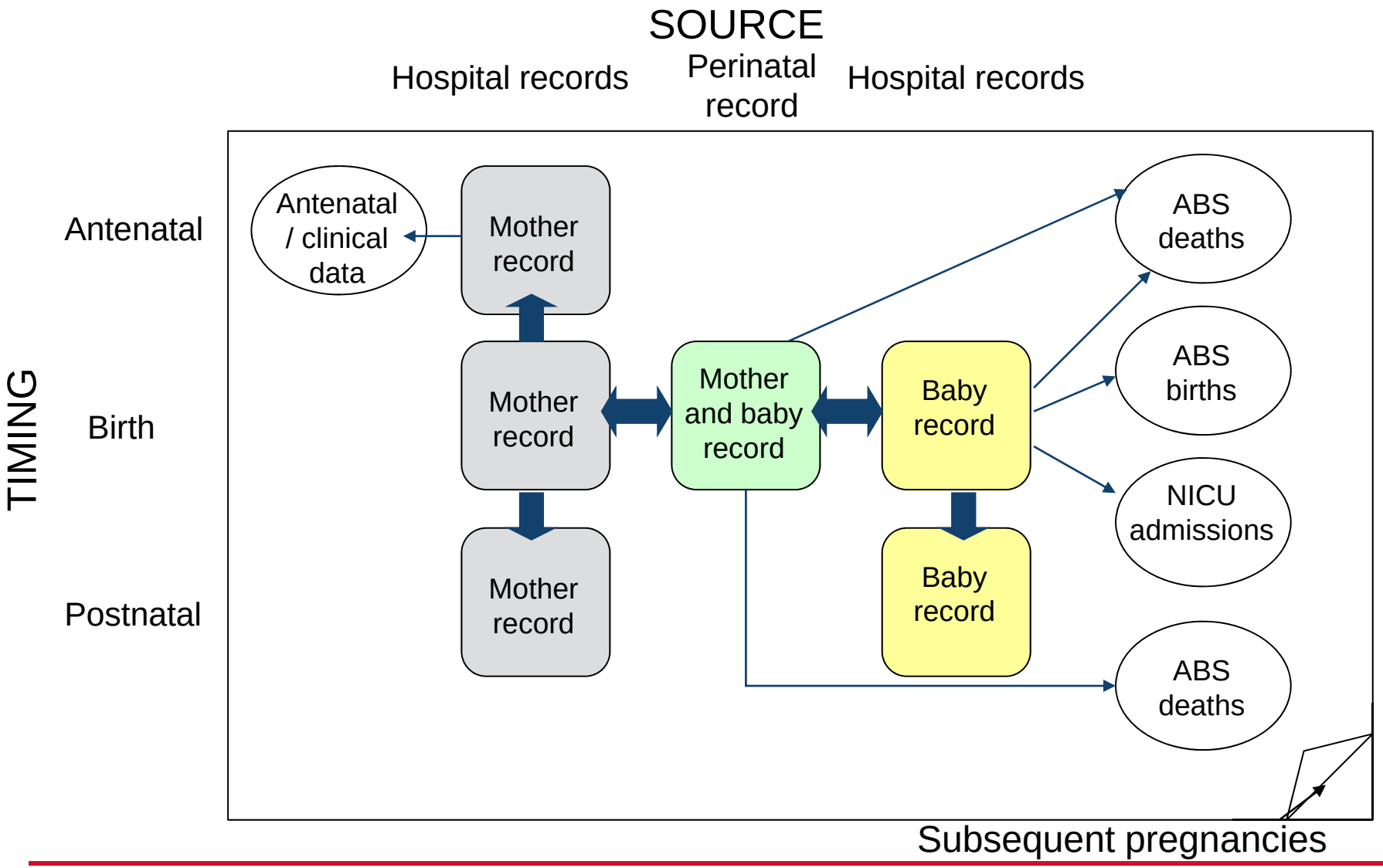
As at Jan 2010

BACKGROUND

PERINATAL LINKAGE

- Perinatal
  - Pertaining to the period immediately before and after birth
    - Antenatal, birth, postnatal
  - Includes mothers and babies
- Linkage of multiple perinatal data sets
  - Follow mothers' hospital admissions during one pregnancy
  - Link mother and babies' (including twins) health records
  - Follow re-admissions for mothers and babies
  - Link subsequent pregnancies

BACKGROUND – PERINATAL LINKAGE



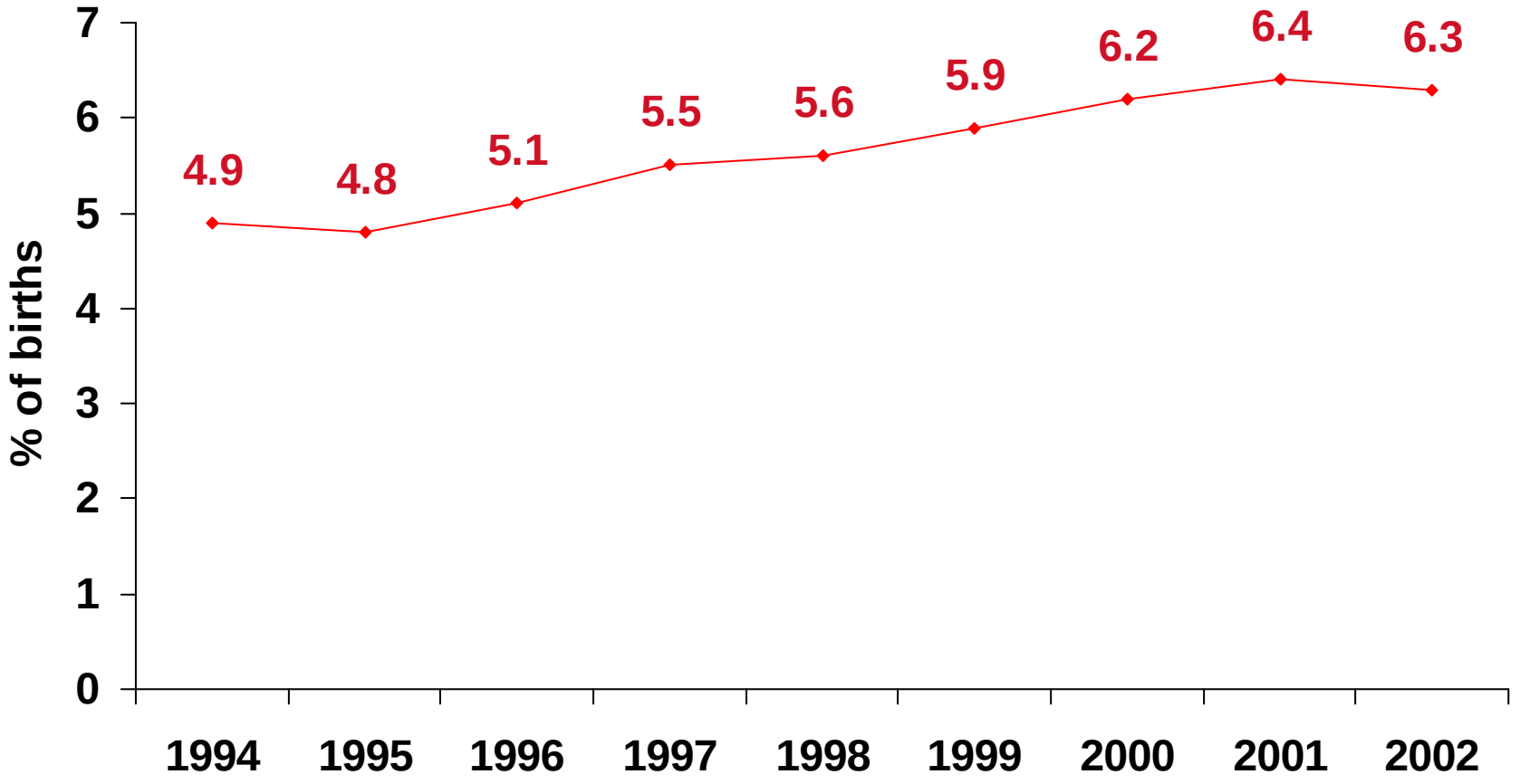
BACKGROUND

POSTPARTUM HAEMORRHAGE (PPH)

- Excessive bleeding after childbirth
  - Immediately after (primary)
  - In the few weeks after (secondary)
- In the hospital data PPH is:
  - A haemorrhage of 500 ml or more following vaginal delivery, OR
  - A post-caesarean haemorrhage of 750ml or more
- Documented by an obstetrician/ clinician/ midwife
- Two validation studies have demonstrated that hospital data under-reports PPH (misses 25-30% of cases), however most cases are true cases (high specificity, 99.8%)

PPH TRENDS IN NEW SOUTH WALES

POSTPARTUM HAEMORRHAGE IN THE BIRTH ADMISSION, 1994-2002



Cameron CA, et al *Aust NZ J Pub Health* 2007; 30:151-156

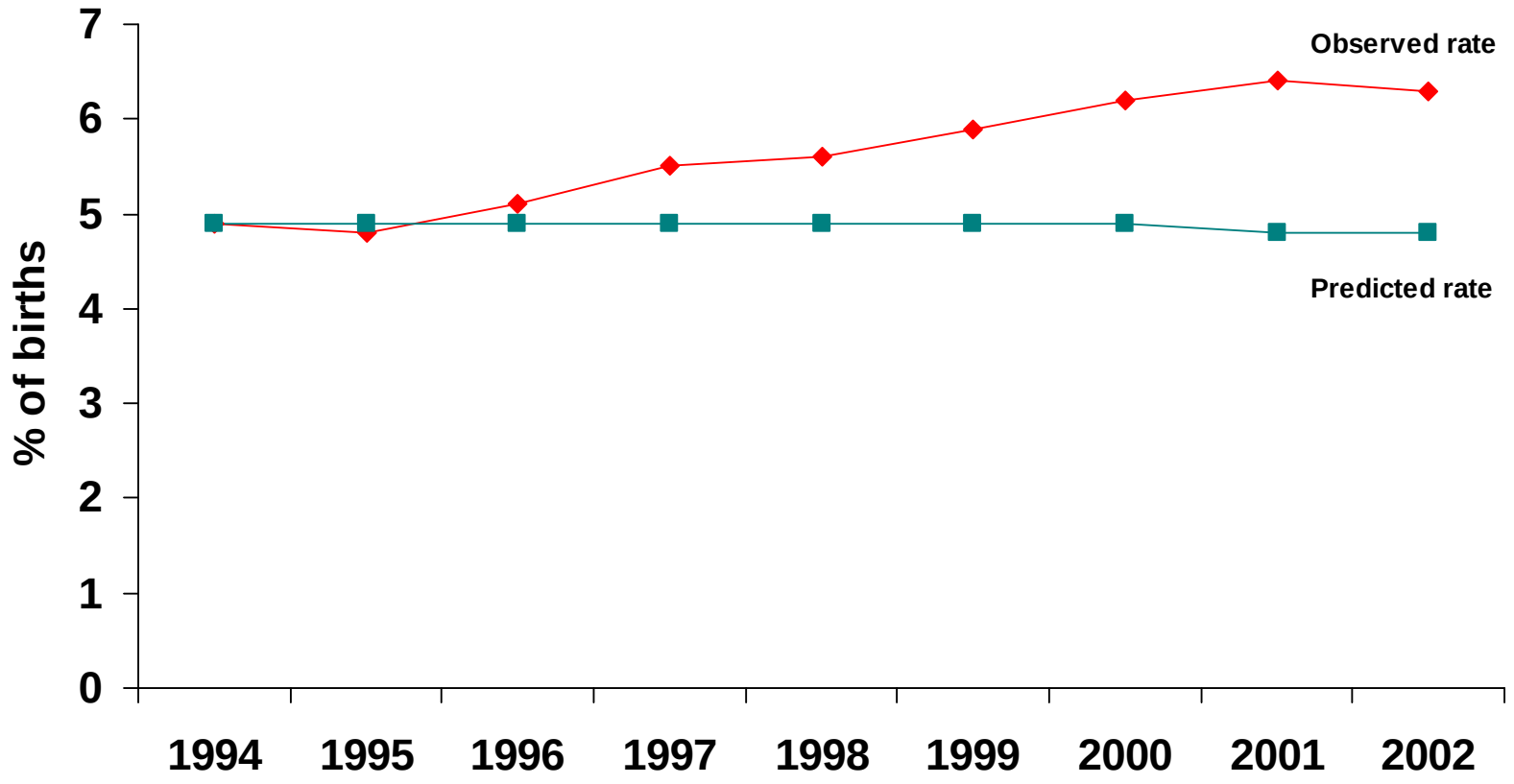
PPH TRENDS IN NEW SOUTH WALES

- No change in re-admission rates with PPH

- Proportion of PPHs with:
  - Hysterectomy did not change (0.5%)
  - Transfusion increased dramatically (1.9% to 11.7%)

PPH TRENDS IN NEW SOUTH WALES

EXPLAINING THE INCREASE



Ford JB, et al *Int J Gynecol Obstet* 2007; 98: 237-243

PPH TRENDS IN NEW SOUTH WALES

EXPLAINING THE INCREASE

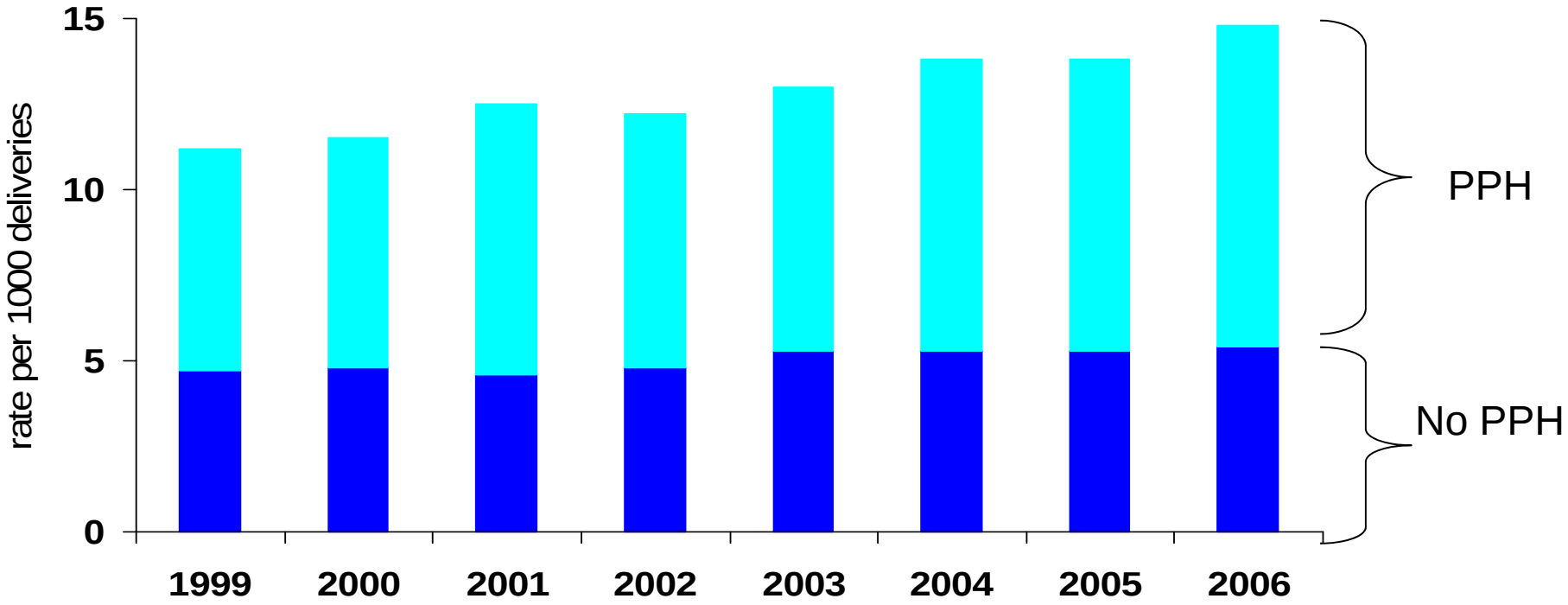
- Not explained by changes in risk factors:
  - Increasing maternal age, caesarean section rate
  - Other maternal factors such as number of previous births, pregnancy complications
  - Other practice factors such as inductions, augmentations

- Other factors we could not measure may be having an effect:
  - Changes in management of delivery of the placenta
  - Increasing obesity rates

PPH TRENDS IN NEW SOUTH WALES

MATERNAL MORBIDITY

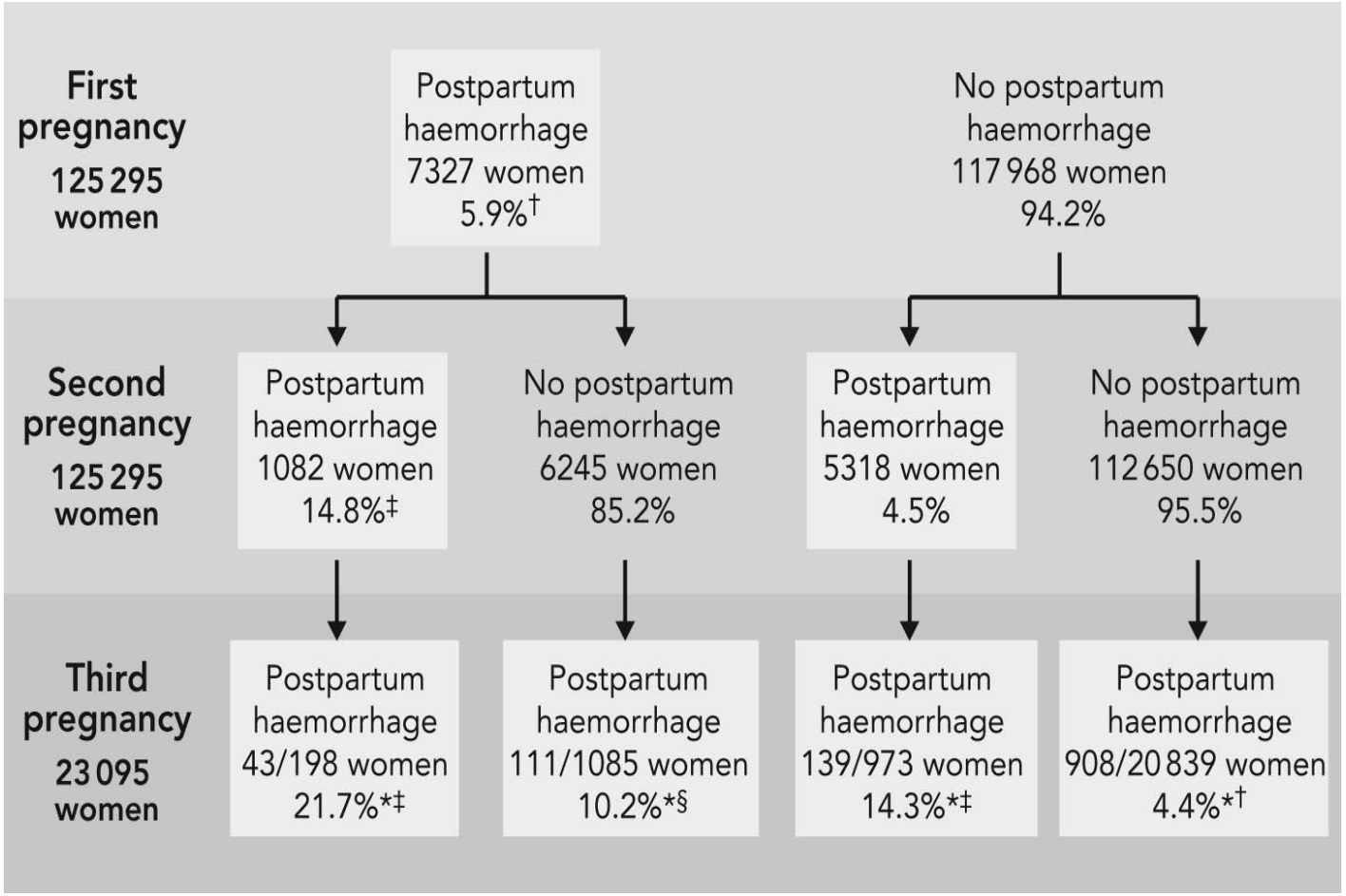
Trend in severe adverse maternal outcomes during the birth admission, 1999-2004



Roberts CL et al. *BMC Pregnancy and Childbirth* 2009, 9:7

PPH TRENDS IN NEW SOUTH WALES

POSTPARTUM HAEMORRHAGE RECURRENCE, 1994-2002



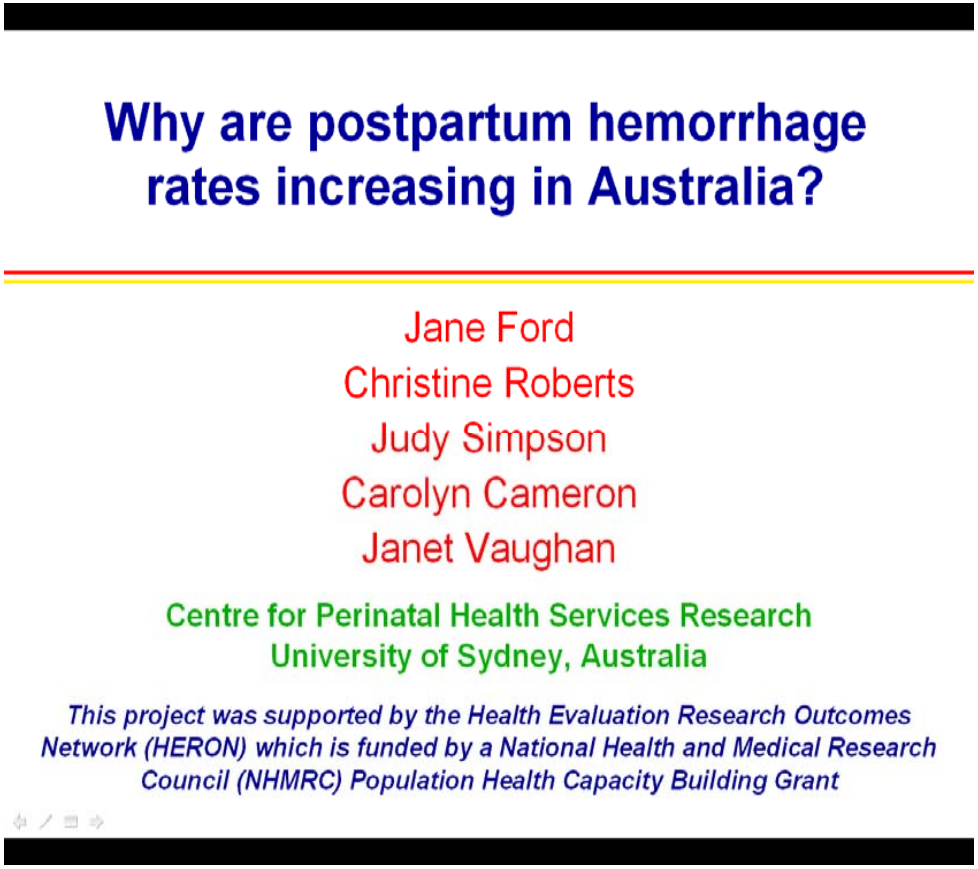
Ford JB, et al. *Med J Aust* 2007;187:391-393

THE UNIVERSITY OF SYDNEY

INTERNATIONAL WORKING GROUP ON POSTPARTUM HAEMORRHAGE

INTERNATIONAL WORKING GROUP ON PPH

- Presented early work on postpartum haemorrhage at the Society for Paediatric and Perinatal Epidemiology conference in Seattle, 2006



Why are postpartum hemorrhage rates increasing in Australia?

Jane Ford
Christine Roberts
Judy Simpson
Carolyn Cameron
Janet Vaughan

Centre for Perinatal Health Services Research
University of Sydney, Australia

This project was supported by the Health Evaluation Research Outcomes Network (HERON) which is funded by a National Health and Medical Research Council (NHMRC) Population Health Capacity Building Grant

INTERNATIONAL WORKING GROUP ON PPH

A52. Investigation of an increase in postpartum hemorrhage in Canada

KS Joseph, J Rouleau, MS Kramer, DC Young, R Liston, TF Baskett*
(Canadian Perinatal Surveillance System)

Background: Preliminary analyses carried out previously have shown a recent increase in hysterectomies for postpartum hemorrhage in Canada. The authors carried out a study to confirm and explain this finding.

Methods: All hospital deliveries in Canada between 1991 and 2002 were studied using data from the Canadian Institute for Health Information (incomplete data from Quebec, Manitoba and Nova Scotia were excluded). Deliveries with postpartum hemorrhage by subtype were identified using International Classification of Diseases codes, while hysterectomies and blood transfusions were identified using procedure codes. Temporal changes in postpartum hemorrhage, postpartum hemorrhage with hysterectomy and relevant determinants (maternal age, previous cesarean, multiple pregnancy, epidural anesthesia, induction, prolonged labor, cesarean delivery, etc) were quantified. Crude and adjusted period changes were assessed using logistic models.

Results: Postpartum hemorrhage rates increased from 4.1% in 1991 to 5.1% in 2002 (26% increase, 95% confidence interval (CI) 23 to 29%), while postpartum hemorrhage with hysterectomy rates increased from 24.0 in 1991 to 44.9 per 100,000 deliveries in 2002 (87% increase, 95% CI 37 to 154%). Rates of postpartum hemorrhage with blood transfusion declined from 150.0 in 1991 to 22.2 per 100,000 deliveries in 2002. The increase in postpartum hemorrhage was due to an increase in atonic postpartum hemorrhage, from 29.4 per 1,000 deliveries in 1991 to 39.5 per 1,000 deliveries in 2002 (36% increase, 95% CI 32 to 40%). Adjustment for determinants of postpartum hemorrhage did not explain the temporal increase in atonic postpartum hemorrhage and only partly attenuated the increase in atonic postpartum hemorrhage with hysterectomy.

Conclusion: A recent unexplained increase in the frequency, and possibly the severity, of atonic postpartum hemorrhage in Canada remains unexplained.

INTERNATIONAL WORKING GROUP ON PPH

- Workshop to explore rising rates of postpartum haemorrhage
  - funded by the CDC and Canadian Institute of Health Research
  - held in Montreal, Canada Nov 10-11, 2008

- Participants from Australia, Canada, USA, Belgium, France, UK

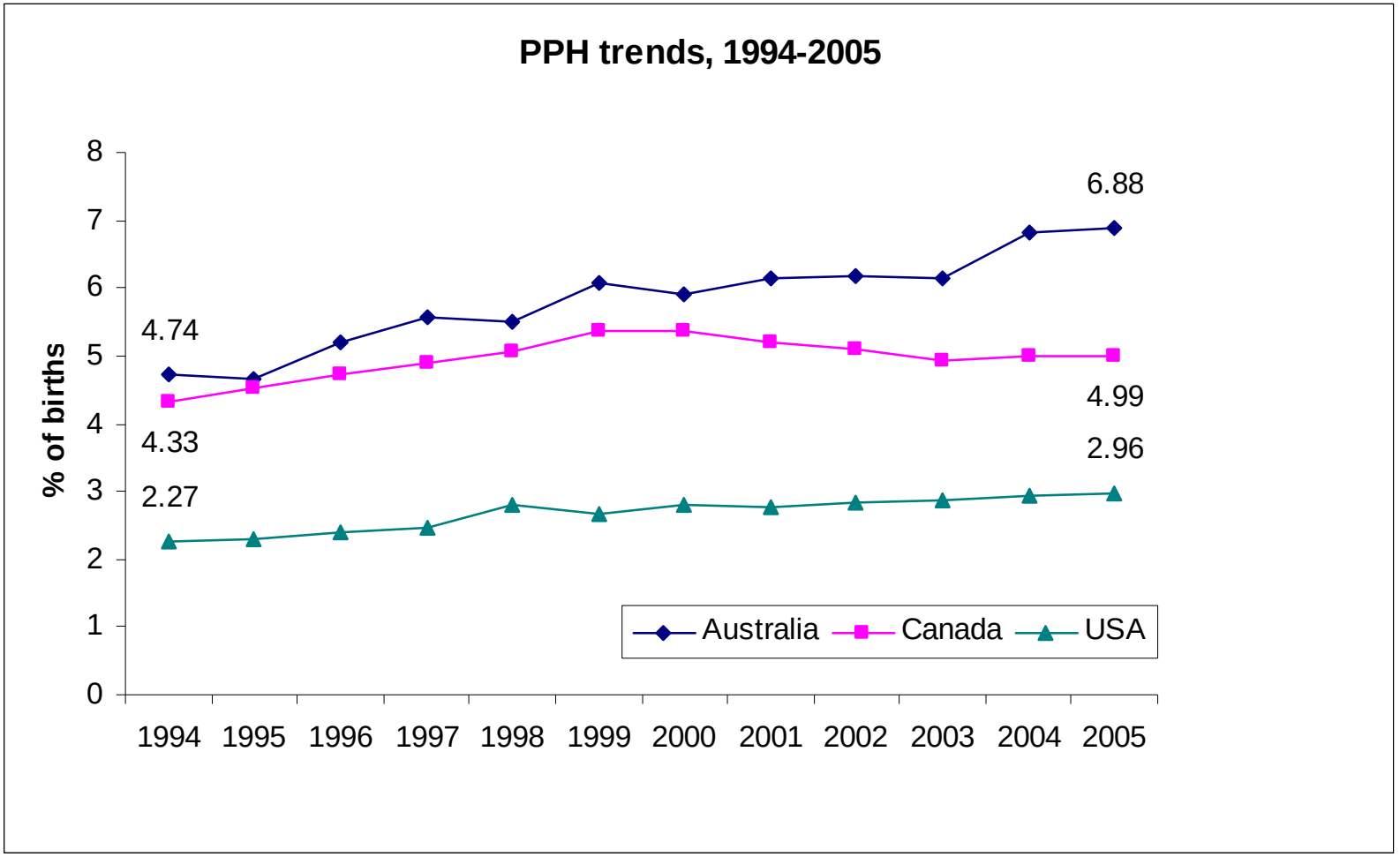
INTERNATIONAL WORKING GROUP ON PPH

AGENDA

- Country perspectives
- Data – definitions, ascertainment
- Impact of:
  - Population characteristics
  - Obstetric practice
  - Environmental contaminants
- Is PPH increasing, what should we do about it
- Research directions

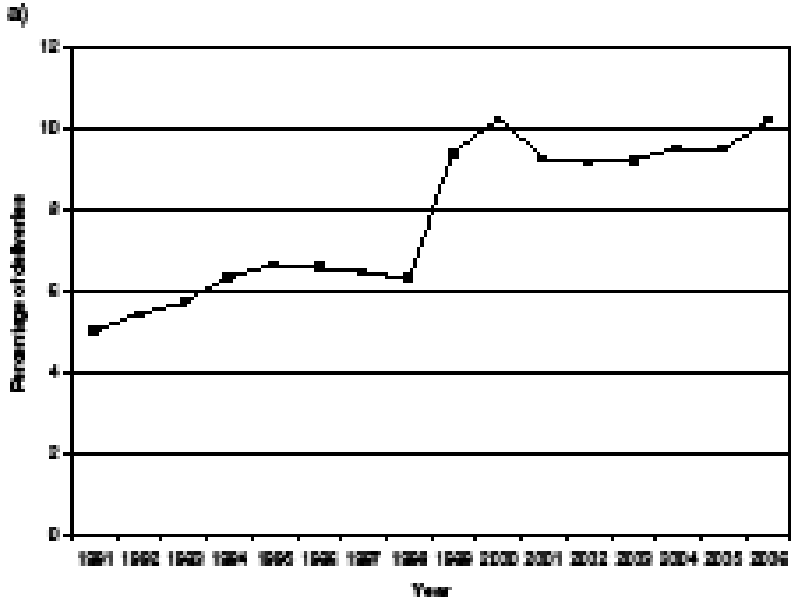
INTERNATIONAL WORKING GROUP ON PPH

COUNTRIES WITH COMPARABLE CODED DATA

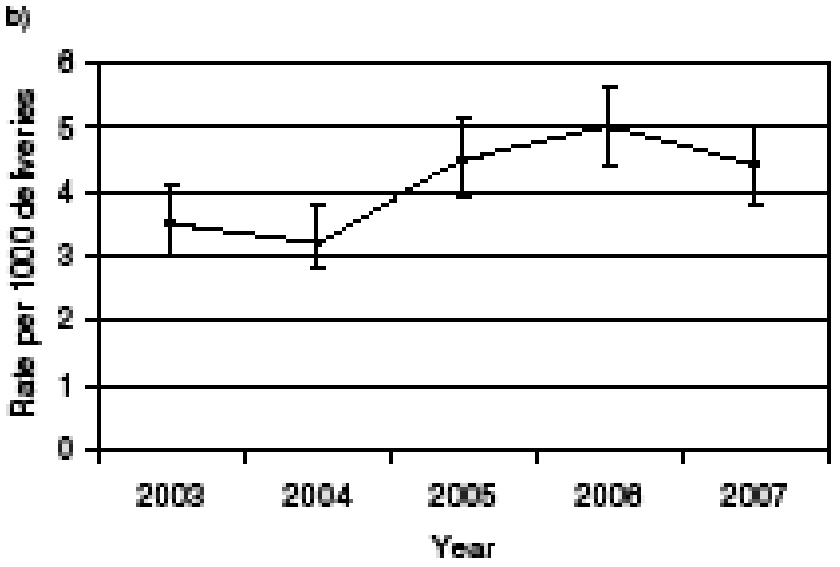


INTERNATIONAL WORKING GROUP ON PPH

COUNTRIES/ AREAS WITH OTHER DATA



PPH, Victoria, Australia



Severe haemorrhage, Scotland
(blood loss >2500 mls, transfused)

INTERNATIONAL WORKING GROUP ON PPH

- Need for standardised reporting
- Areas for further investigation:
  - Atony (lack of a contracting uterus) as a potential cause
  - Management of delivery of placenta
  - Length of second stage of labour
  - Transfusion
  - Obesity

BMC Pregnancy and Childbirth

BioMed Central

Research article

Open Access

Trends in postpartum hemorrhage in high resource countries: a review and recommendations from the International Postpartum Hemorrhage Collaborative Group

Marian Knight*[1], William M Callaghan[2], Cynthia Berg[2], Sophie Alexander[3], Marie-Helene Bouvier-Colle[4], Jane B Ford[5], KS Joseph[6,11], Gwyneth Lewis[1,7], Robert M Liston[8], Christine L Roberts[5], Jeremy Oats[9] and James Walker[10]

Address: [1]National Perinatal Epidemiology Unit, University of Oxford, Oxford, UK, [2]Division of Reproductive Health, Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA, [3]Perinatal Epidemiology and Reproductive Health Unit, Université Libre de Bruxelles, Belgium, [4]INSERM- Unité 149, Paris, France, [5]The Kolling Institute of Medical Research, University of Sydney at Royal North Shore Hospital, Sydney, Australia, [6]Dept of Obstetrics & Gynecology and Pediatrics, Dalhousie University, Halifax, Canada, [7]Department of Health, London, UK, [8]BC Women's Hospital & Health Centre, Vancouver, BC, Canada, [9]The Royal Women's Hospital, Parkville, Victoria, Australia, [10]St James University Hospital, Leeds, UK and [11]Dept of Obstetrics & Gynecology and the School of Population and Public Health, University of British Columbia, Vancouver, Canada

Email: Marian Knight* - marian.knight@npeu.ox.ac.uk; William M Callaghan - wgc0@cdc.gov; Cynthia Berg - cjb3@cdc.gov; Sophie Alexander - salexand@ulb.ac.be; Marie-Helene Bouvier-Colle - bouvier@cochin.inserm.fr; Jane B Ford - jford@med.usyd.edu.au; KS Joseph - kjoseph@dal.ca; Gwyneth Lewis - gwyneth.lewis@dh.gsi.gov.uk; Robert M Liston - rliston@cw.bc.ca; Christine L Roberts - clroberts@med.usyd.edu.au; Jeremy Oats - jeremy.oats@rwh.org.au; James Walker - j.j.walker@leeds.ac.uk

* Corresponding author

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INTERNATIONAL WORKING GROUP ON PPH

RECOMMENDATIONS

Conclusion: *Key Recommendations*

Data

1. Future revisions of the International Classification of Diseases should include separate codes for atonic PPH and PPH immediately following childbirth that is due to other causes. Also, additional codes are required for placenta accreta/percreta/increta.

2. Definitions of PPH should be unified; further research is required to investigate how definitions are applied in practice to the coding of data.

3. Additional improvement in the collection of data concerning PPH is required, specifically including a measure of severity.

Research

4. Further research is required to determine whether an increased rate of reported PPH is also observed in other countries, and to further investigate potential risk factors including increased duration of labor, obesity and changes in second and third stage management practice.

Managemt

5. Training should be provided to all staff involved in maternity care concerning assessment of blood loss and the monitoring of women after childbirth. This is key to reducing the severity of PPH and preventing any adverse outcomes.

6. Clinicians should be more vigilant given the possibility that the frequency and severity of PPH has in fact increased. This applies particularly to small hospitals with relatively few deliveries where management protocols may not be defined adequately and drugs or equipment may not be on hand to deal with unexpected severe PPH.

INTERNATIONAL WORKING GROUP ON PPH

OUTCOMES

- Directing current/ future research
  - Investigating duration of labour (2nd stage), transfusions
  - Data quality
- Advocating for standardised international measurement and reporting
- Widened audience for our research, increased profile of our group
- Wider knowledge of linked data capabilities
- Other collaborations…..

OTHER DEVELOPING INTERNATIONAL COLLABORATIONS

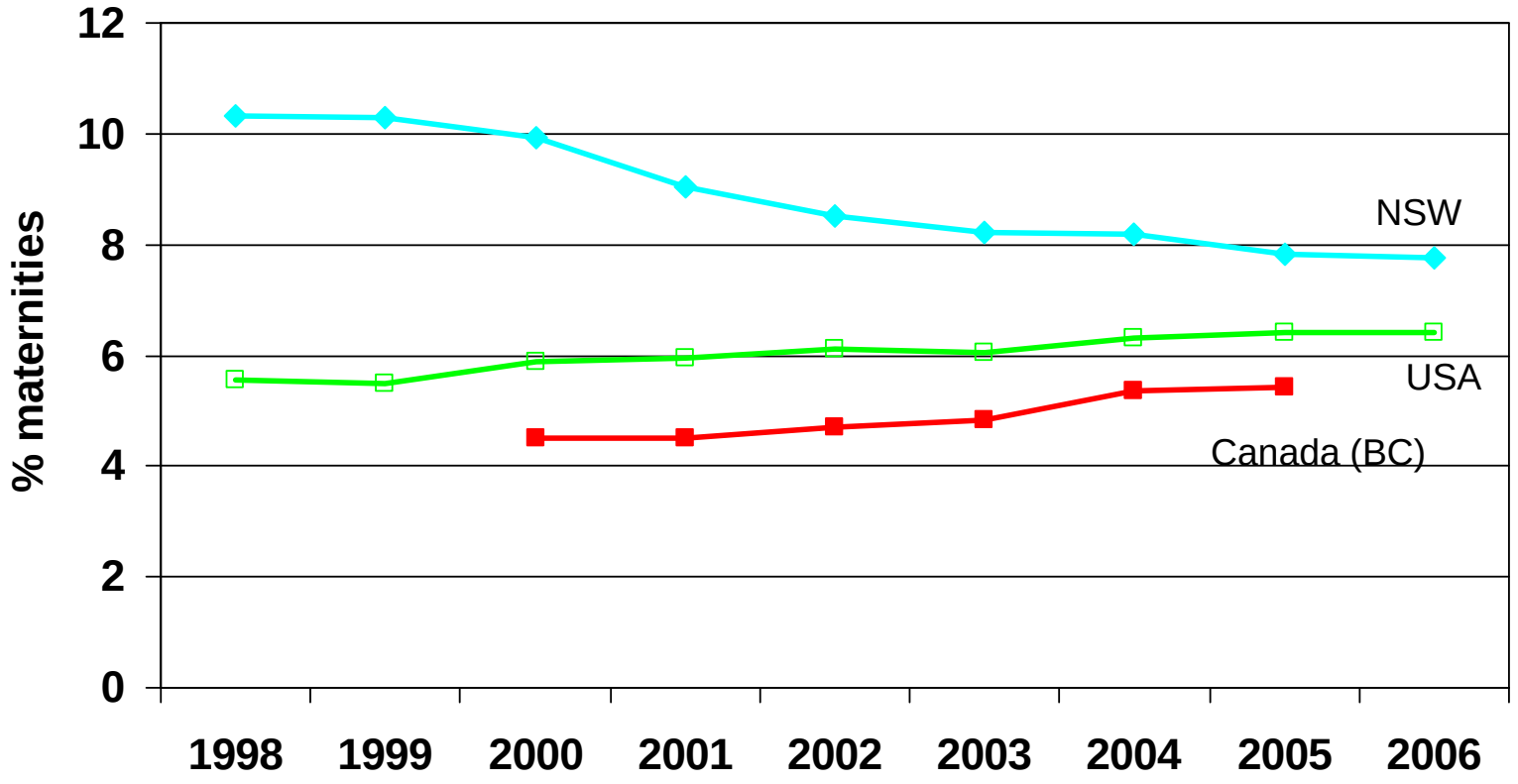
DEVELOPING INTERNATIONAL COLLABORATIONS

AMNIOTIC FLUID EMBOLISM

- A rare obstetric emergency in which amniotic fluid, fetal cells, hair, or other debris enters the mother's blood stream and triggers an allergic reaction. This reaction then results in cardiorespiratory (heart and lung) collapse and coagulopathy.
- Meeting to be held in Oxford, UK in July this year with a similar format to the PPH working group

DEVELOPING INTERNATIONAL COLLABORATIONS

PREGNANCY HYPERTENSION



Participating countries include: Australia, Scotland, Sweden, Denmark, Norway, USA, Canada

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AND …….

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