

Perinatal Health in Canada: An Overview

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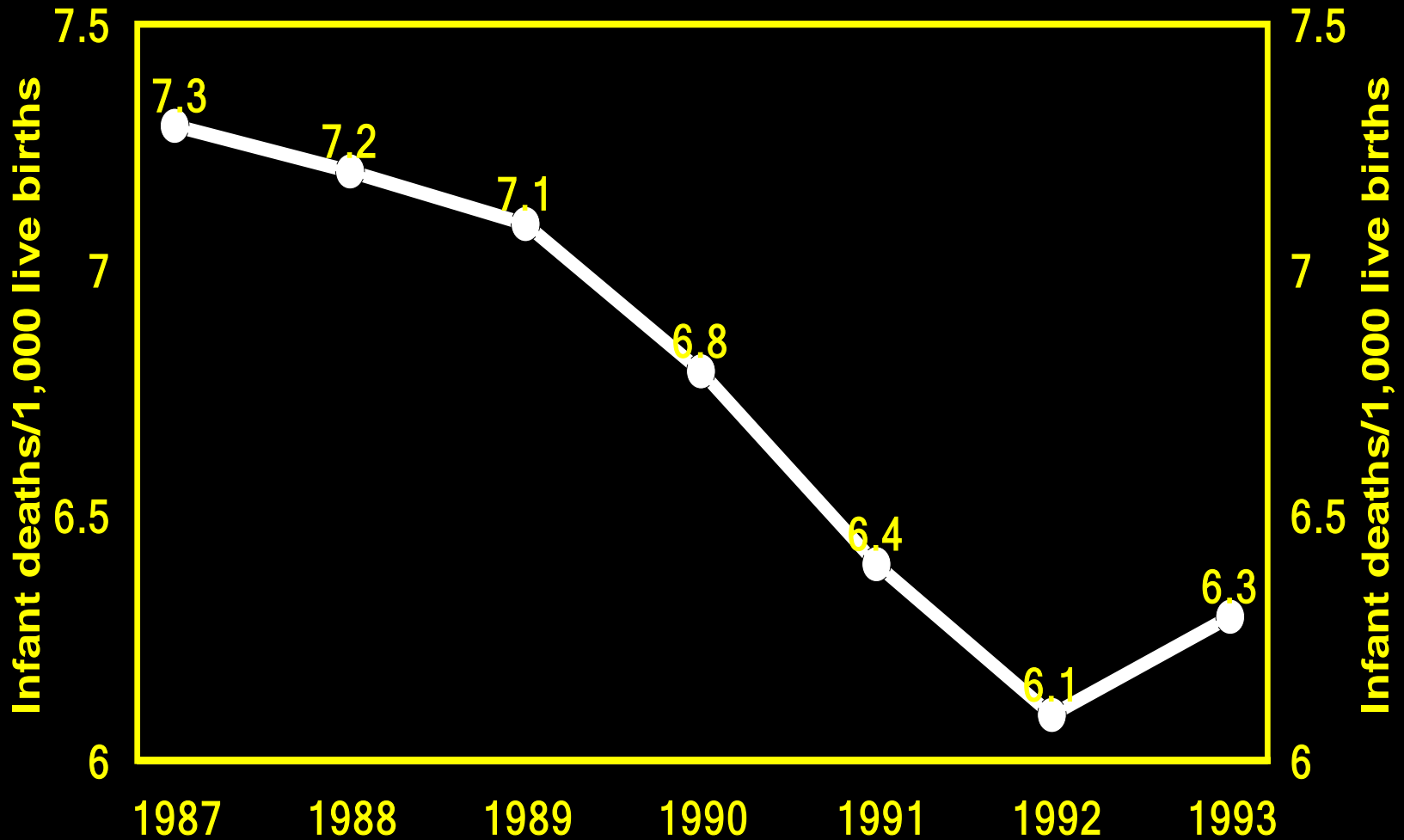
Canadian Perinatal Surveillance System

Canadian Perinatal Surveillance System

Fetal and Infant Health Issues

1. Recent history
 - 1a. Upturn in infant mortality Canada, 1993
 - 1b. Low birth wt epidemic Ontario, 1993-94
2. Data quality
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1a. Infant mortality in Canada, 1987-93



(First increase in 3 decades, some 80 -100 excess deaths)

Rising deaths among infants stun scientists

Unexpectedly high mortality rate may be signal, demographers warn

BY ALANNA MITCHELL
The Globe and Mail

For the first time, Statistics Canada has recorded a far higher number of deaths among Canadians than it expected, including the first rise in 31 years in the infant mortality rate.

The figures, published yesterday, left those who follow population trends flabbergasted, so contrary are they to what had been predicted.

can will not know whether this is a blip or the beginning of a new trend until data for the next few years are in.

Reversals in such long-standing trends are rare in population studies. Even rarer is when they are also unexpected, as this one was. Although demographers said they cannot predict trends, and these figures might be an anomaly, the fact that such crude indicators as rate of infant

Could this be the first indication that the environment is becoming increasingly toxic?

Why more babies are dying

Statistics Canada tells us that the rate of baby deaths in the first week of life is increasing (Death Rate Rises, Baffles Experts — June 2). The reaction of the statisticians is described as one of surprise.

At best, they are being disingenuous. The economists and administrators are now reaping the whirlwind they sowed a few years ago. The unfortunate part is that all of us are paying the price in increased deaths among the very young and the very old — something that was totally predictable.

Prior to 1990, the average length of hospital stay for new mothers and their babies was three to four days. In that time, the babies were closely assessed and monitored by experienced nurses. Potential problems,

both physical and psychosocial, were identified and appropriate treatment initiated. In addition, the parenting skills of the mothers were assessed and teaching initiated to enable the moms to care for their babies at home.

Beginning in the early 1990s, many hospital administrators decided this was part of the "fat" that needed to be trimmed from the system. Mothers and babies are now pushed out on the street the same day or the day after the baby was born. There is no time for assessment or health teaching.

If the administrators and bureaucrats did, in fact, foresee these results and pushed ahead anyway, then they were criminally negligent. If they were not able to foresee these outcomes, then they were

criminally incompetent.

It can only be expected that, with the right wing (by whatever party label) going to seize power at Queen's Park, we are going to see a lot more such deaths as the "fiscally conservative" philosophy is implemented. Could we at least be spared the pious hypocrisy of those responsible?

V. Niblett, RN, Frankford, Ont.

Re Death Rate Rises, Baffles Experts (June 2):

Where's the mystery? The country's health ministries are just doing for Canada's human population what Fisheries Canada managed to do for the northern cod.

R. J. McLeod, Toronto



1a. Alternative explanation

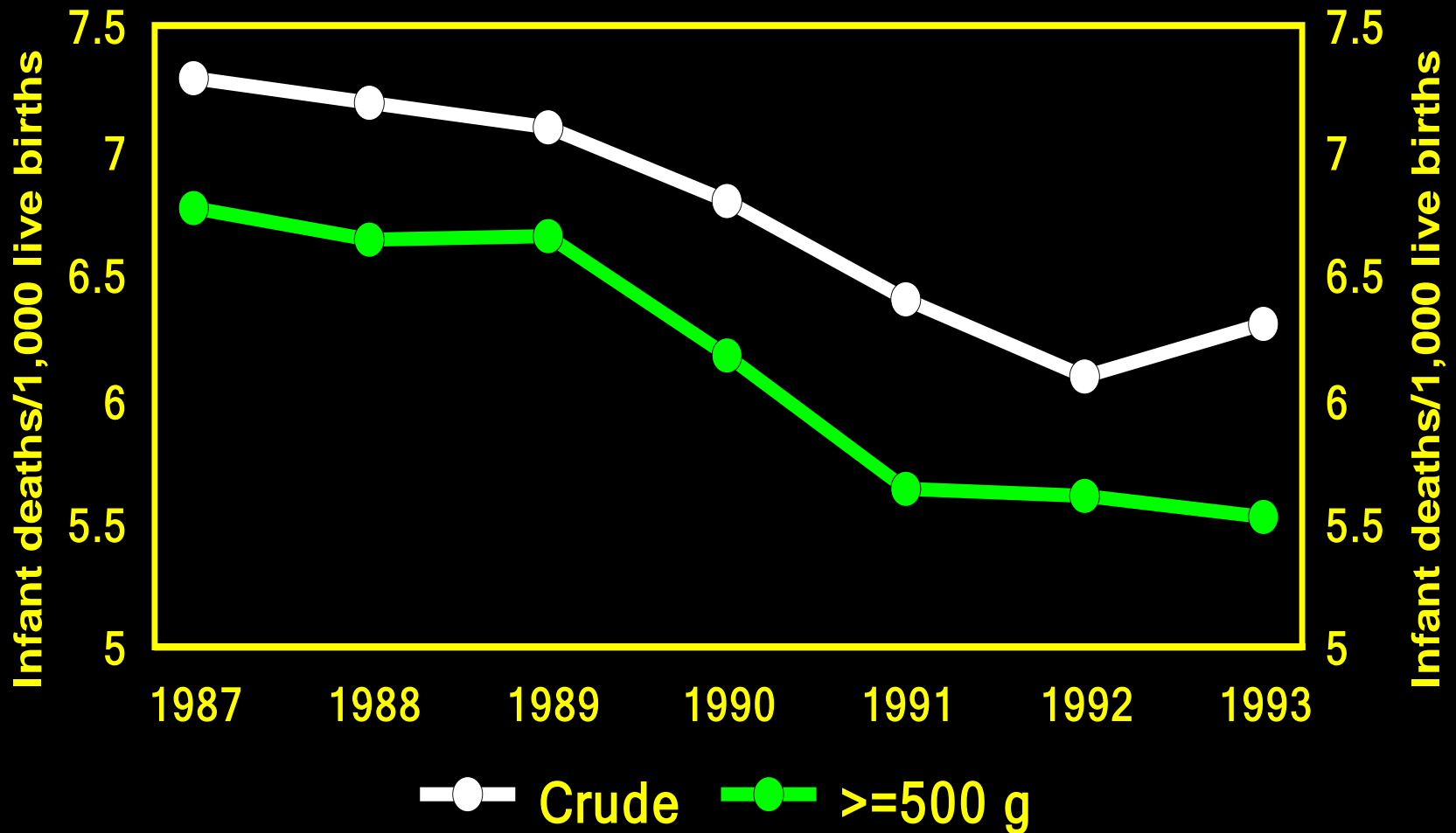
(Joseph and Kramer CMAJ 1996)

- Registration of live births <500 g is variable, could be increasing
- Infant mortality rates among live births <500 g are very high
- Potential for confounding of IMR trends by changes in registration of live births <500 g

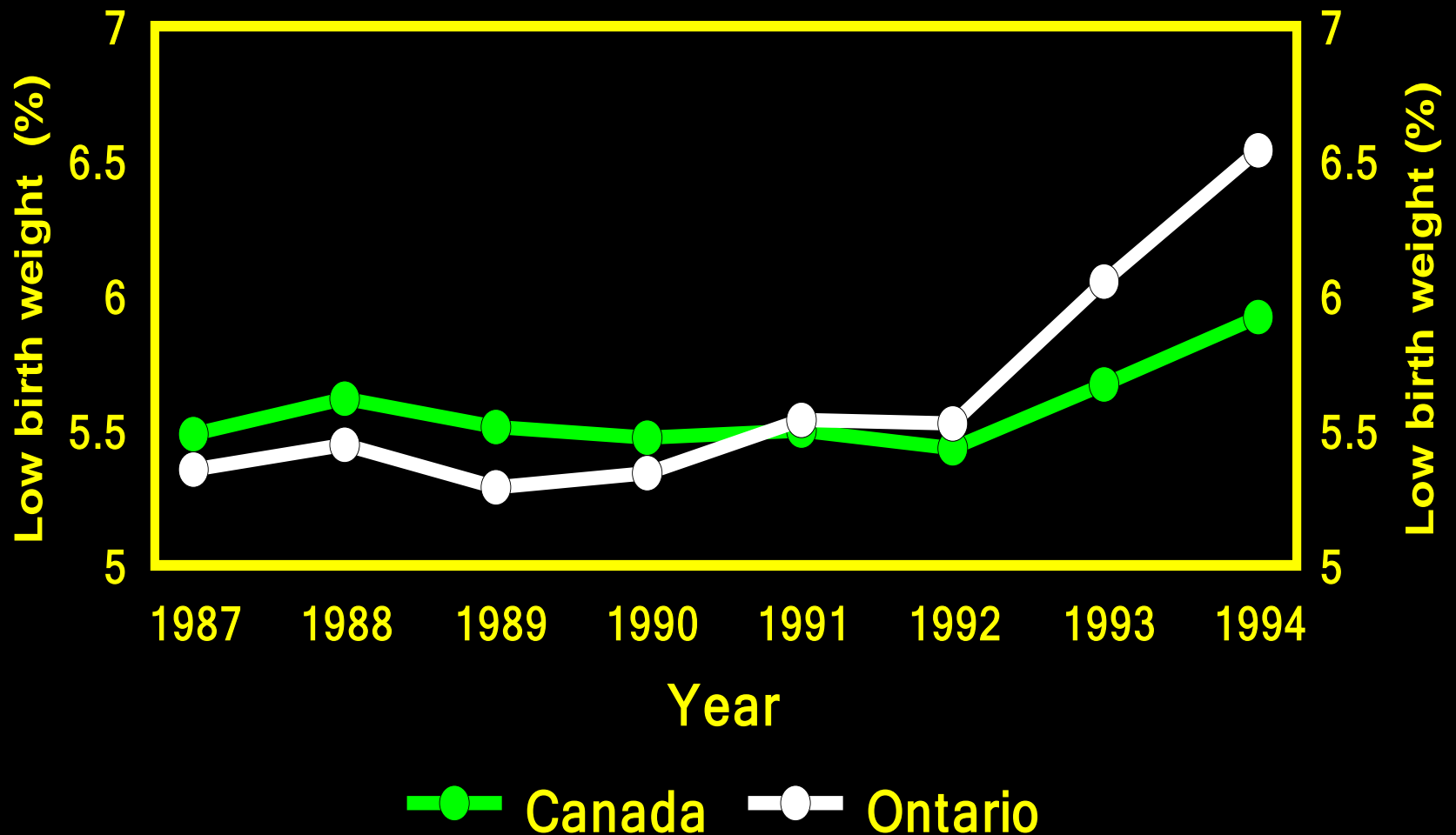
1a. Trends in low birth weight, Canada 1987-93

Year/ BWT (g)	1987	1992	1993	Ratio 93/87	P value for trend
<500	0.47		0.51	0.85	1.80	<0.01
500-749	1.4		1.4	1.6	1.14	0.07
750-999	1.7		1.7	1.8	1.02	0.96
<2,500	54.9		54.4	56.8	1.04	0.28

1a. Infant mortality in Canada, 1987-93



1b. Low Bwt trends, Canada & Ontario, 1987-94



More Toronto newborns underweight

Rise in number of babies with low birth weight attributed to mothers' stress, poverty, poor nutrition

of underweight babies in Toronto has been rising since 1991, and public-health officials say it is caused by poverty and poor nutrition.

The percentage of low-birth-weight babies, as newborns weigh in grams, was 6 per cent in 1991, slightly higher than the national rate of 5.5 per cent.

The rate gradually increased to 6.5 per cent in 1994, the rate of the 9,000 babies born that year.

Public-health officials have yet to pinpoint the reasons, but specialists at the children and Toronto Health departments working with their families believe the reasons remain high and will

continue to rise. Babies often have a range of health problems including epilepsy, respiratory problems and congenital disabilities.

Health departments are investigating the reasons, said Dr. Barry Goldstein, chief of paediatric radiology at the Hospital for Sick Children.

Other factors include poor nutrition and safety nets, said Dr. Goldstein, another neonatologist at Sick Children's. "Given the current economic restraints, we may see a rise in low-birth-weight babies."

These are the kinds of indices we should be following."

While multiple births induced by fertility drugs are a small and constant factor in low-weight births, most are the result of a mother's inadequate nutrition, excessive stress, substance abuse or lack of decent housing, education or health care, doctors and public-health officials say. The numbers include premature births and full-term births.

The factors city epidemiologists consider key causes of low birth weight include: a mother under the age of 18; a mother who is underweight when she becomes pregnant; insufficient nutrition during the pregnancy; emotional stress, whether caused by abuse, isolation, poverty or job or family pressures; and smoking, alcohol or drug abuse.

Still, it is difficult to measure scientifically the extent of each factor, said Janet Phillips, an epidemiologist with the department of public health.

"We don't have the socioeconomic backgrounds of these people counted [by the birth registrar]," Ms. Phillips said.

The department has appointed a team to study the problem, said Diane Patychuk, another city epidemiologist. "We've noticed the increase and put a work group on it to try to find what the reasons are because we don't know."

But Ellen Desjardins, who runs the public health department's Healthiest



Low-birth-weight babies often have to spend weeks in expensive special care, with up to 20 per cent of them suffering from long-term health problems.

(EDWARD REGAN/The Globe and Mail)

Babies Possible program, said the factors listed by the epidemiologists are all interdependent.

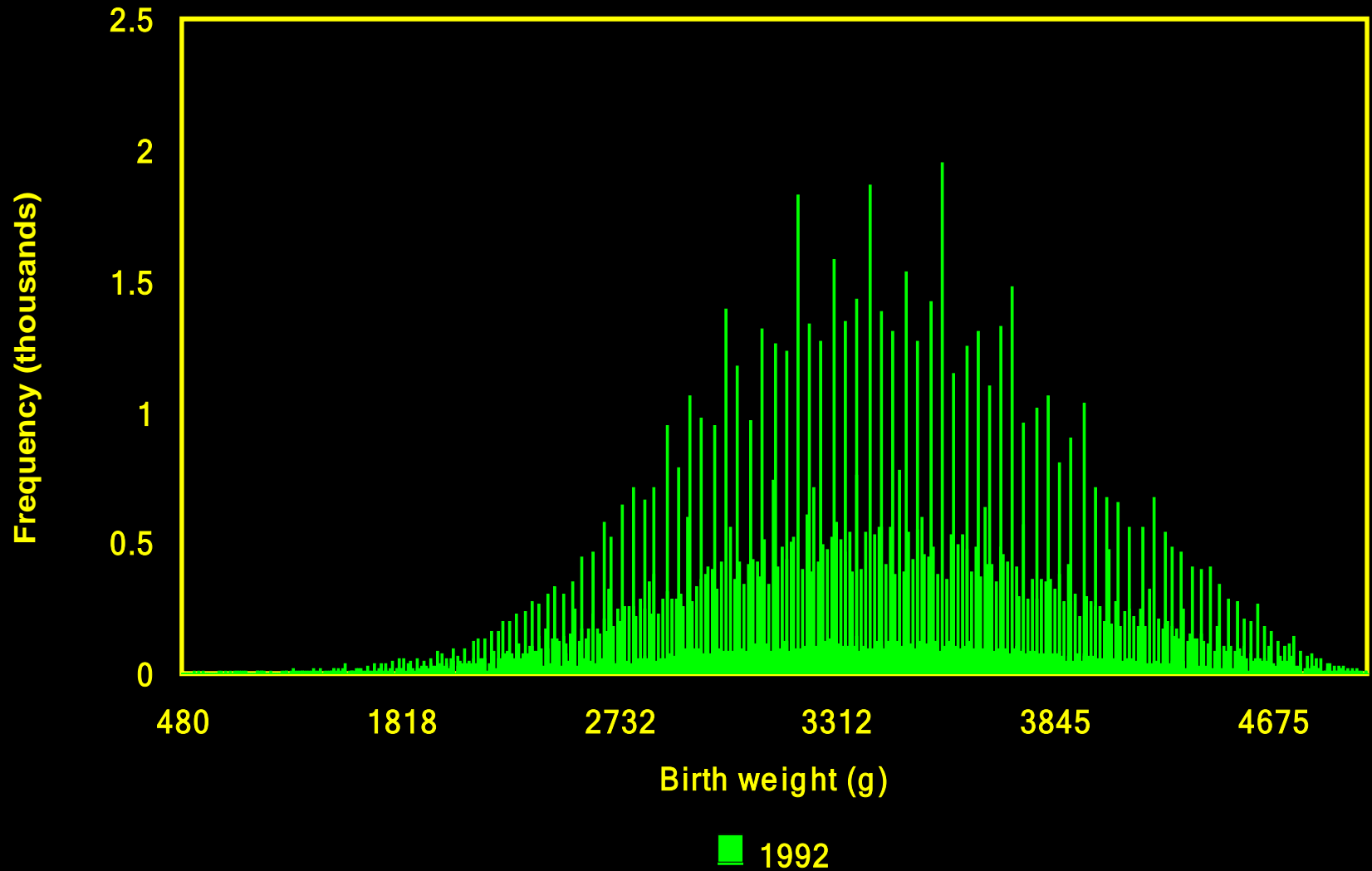
For instance, with teen-aged mothers, it is not physical immaturity that causes the higher risk of low-birth-weight babies, Ms. Desjardins said, but the fact that they are more likely to have the other risk factors.

Thirty-five per cent of teen-aged mothers are underweight when they get pregnant, compared with 20 per cent of adult mothers, she said. They are more likely to smoke than adult women, and often do so as a deliberate means of suppressing their appetite.

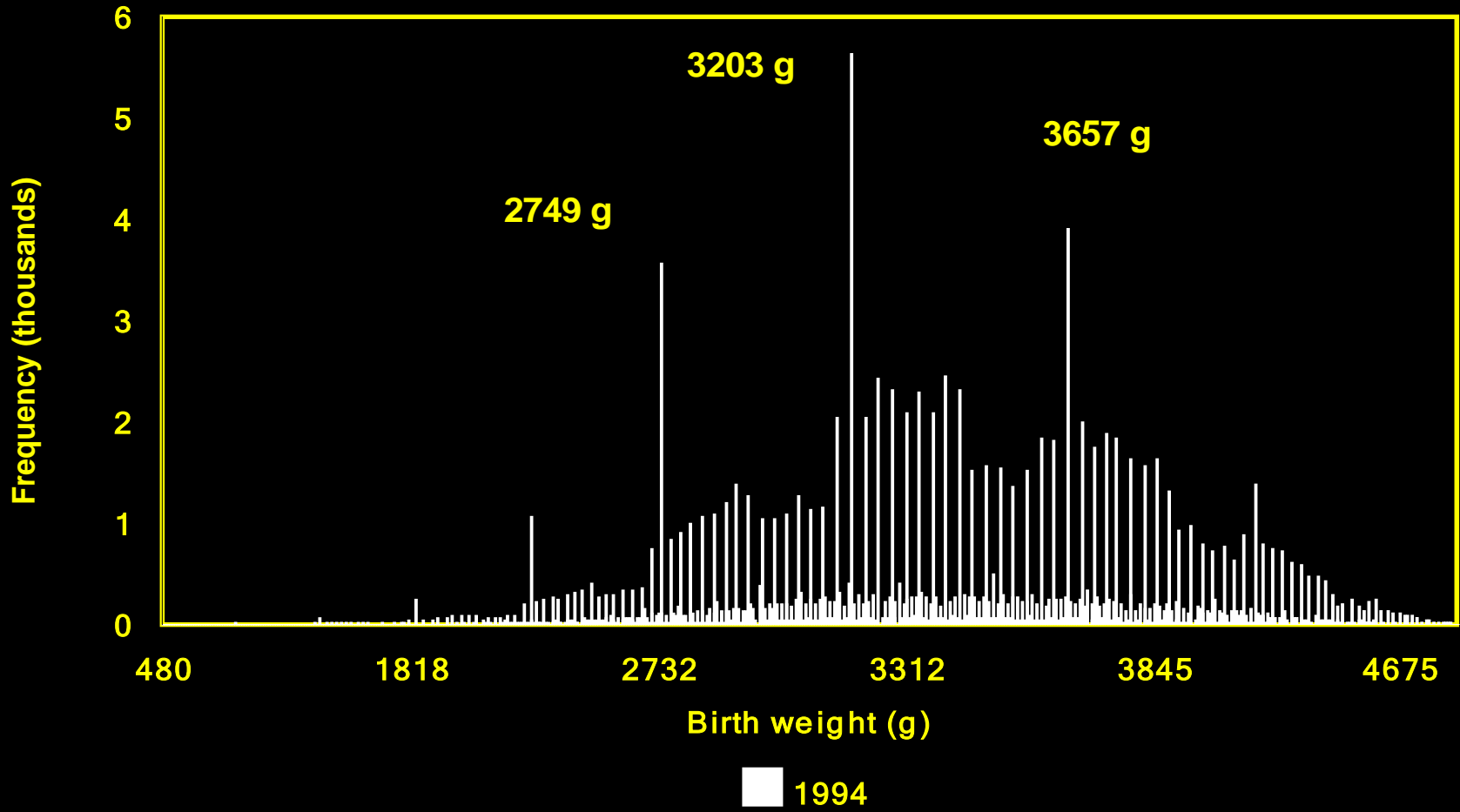
"Girls in adolescence normally lay down a layer of fat in preparation for

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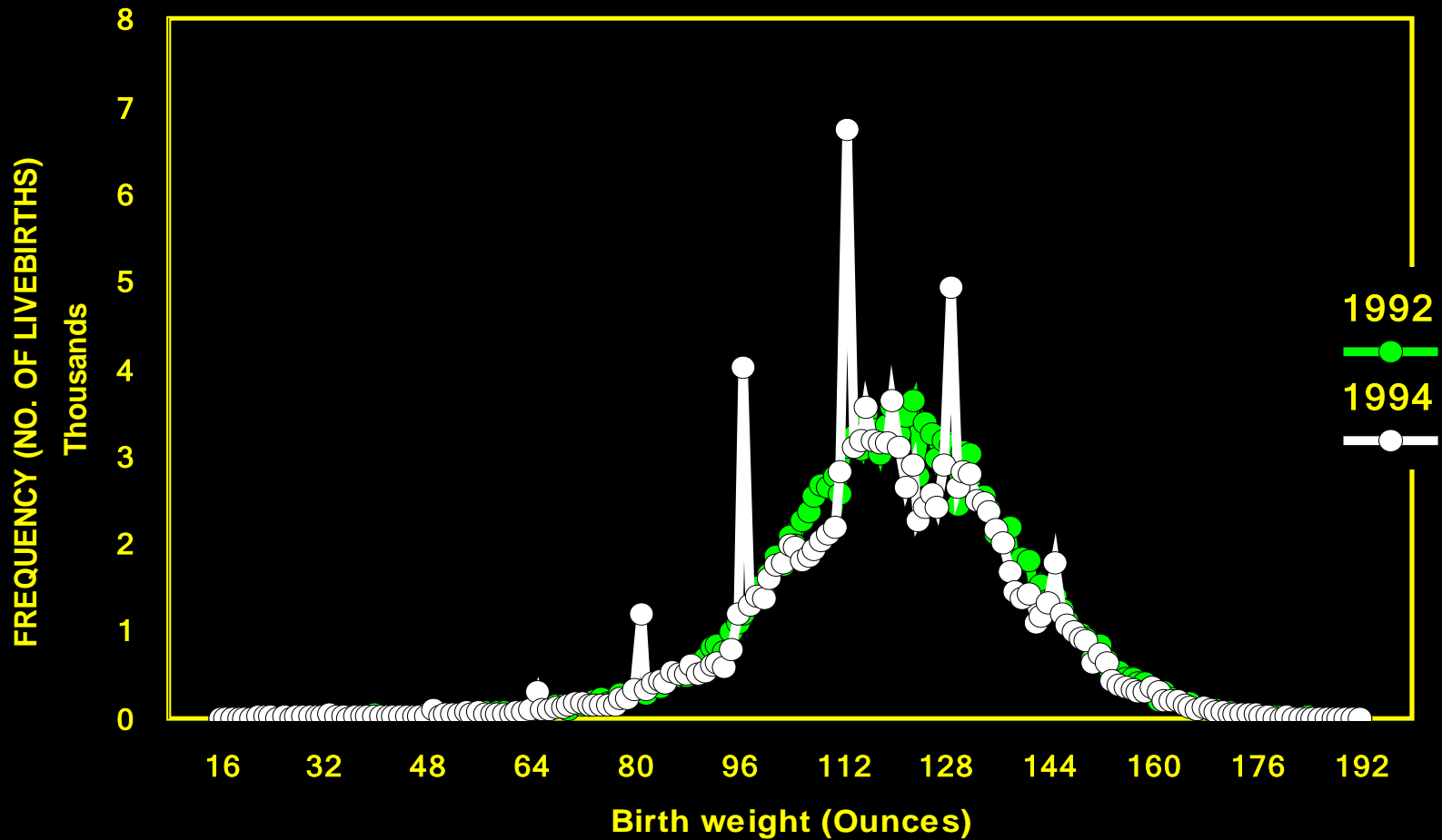
1b. Birth weight distribution, Ontario, 1992



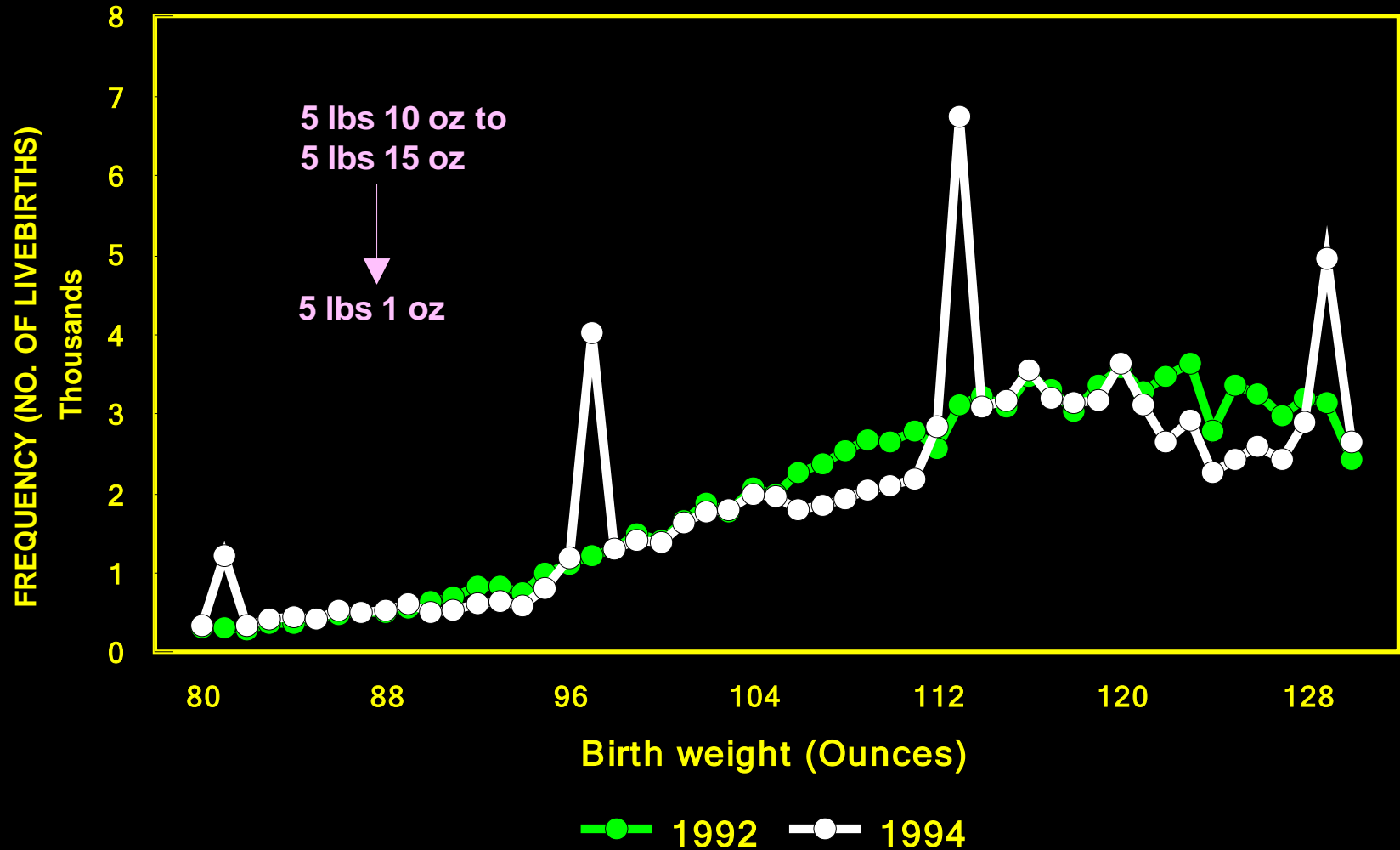
1b. Birth weight distribution, Ontario, 1994



1b. Birth weight distribution, Ontario 1992, 1994 (Joseph and Kramer CMAJ 1997)



1b. Details of the truncation



2. Data quality issues

- Birth wt and gestational age errors in Ontario due to fields being declared non-critical
- These specific errors have been corrected
- Need for Vital Statistics to work with Dept of Health

- Birth wt and gestational age information of good quality in Canada excluding Ontario

3. Substantive focus of CPSS

- Not on infant mortality but on fetal and infant health (consistent with focus on perinatal death and/or serious neonatal morbidity in obstetrics)

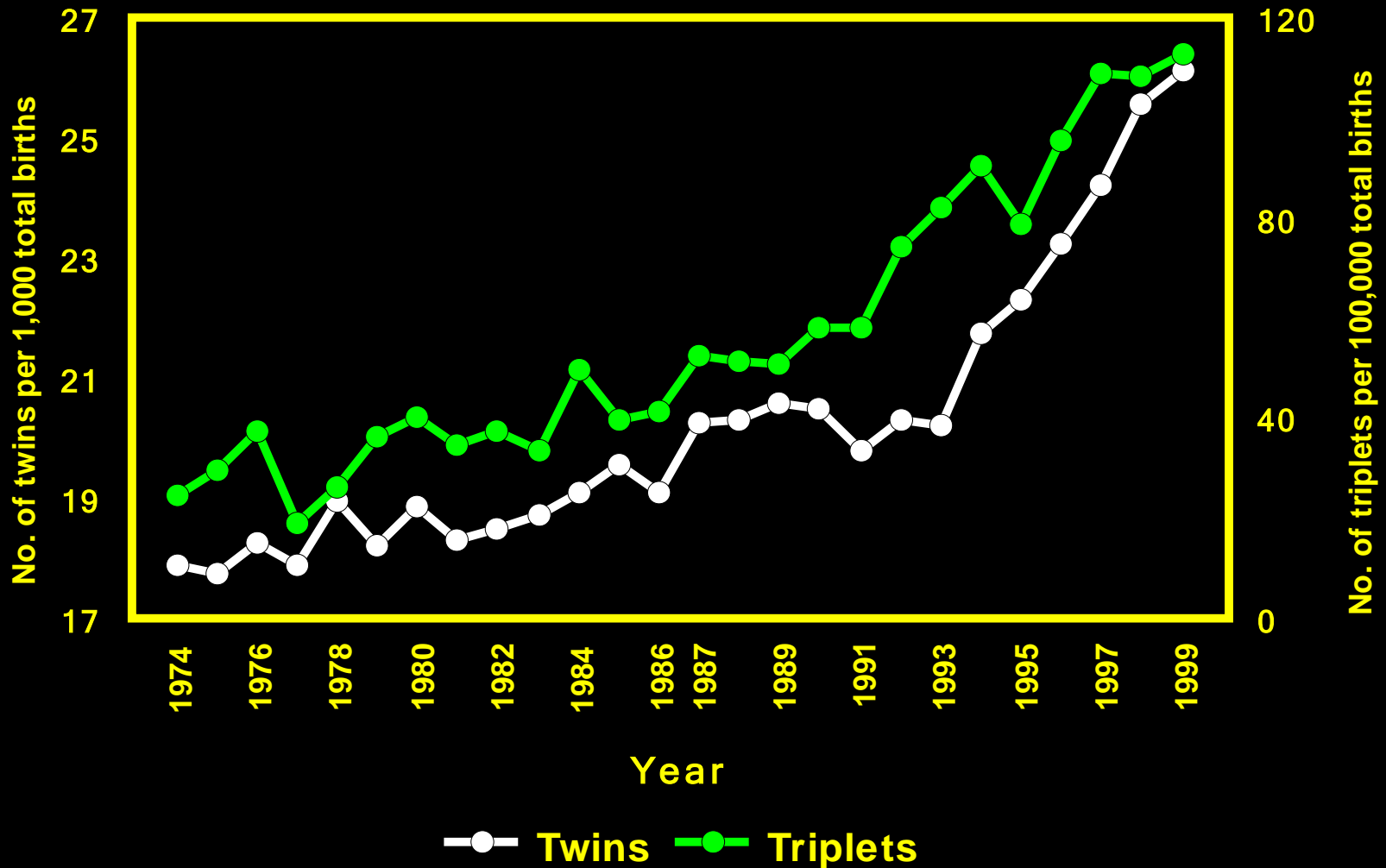
Cf: Fetal and Infant Health Study Group

- Not on low birth weight but on preterm birth and fetal growth

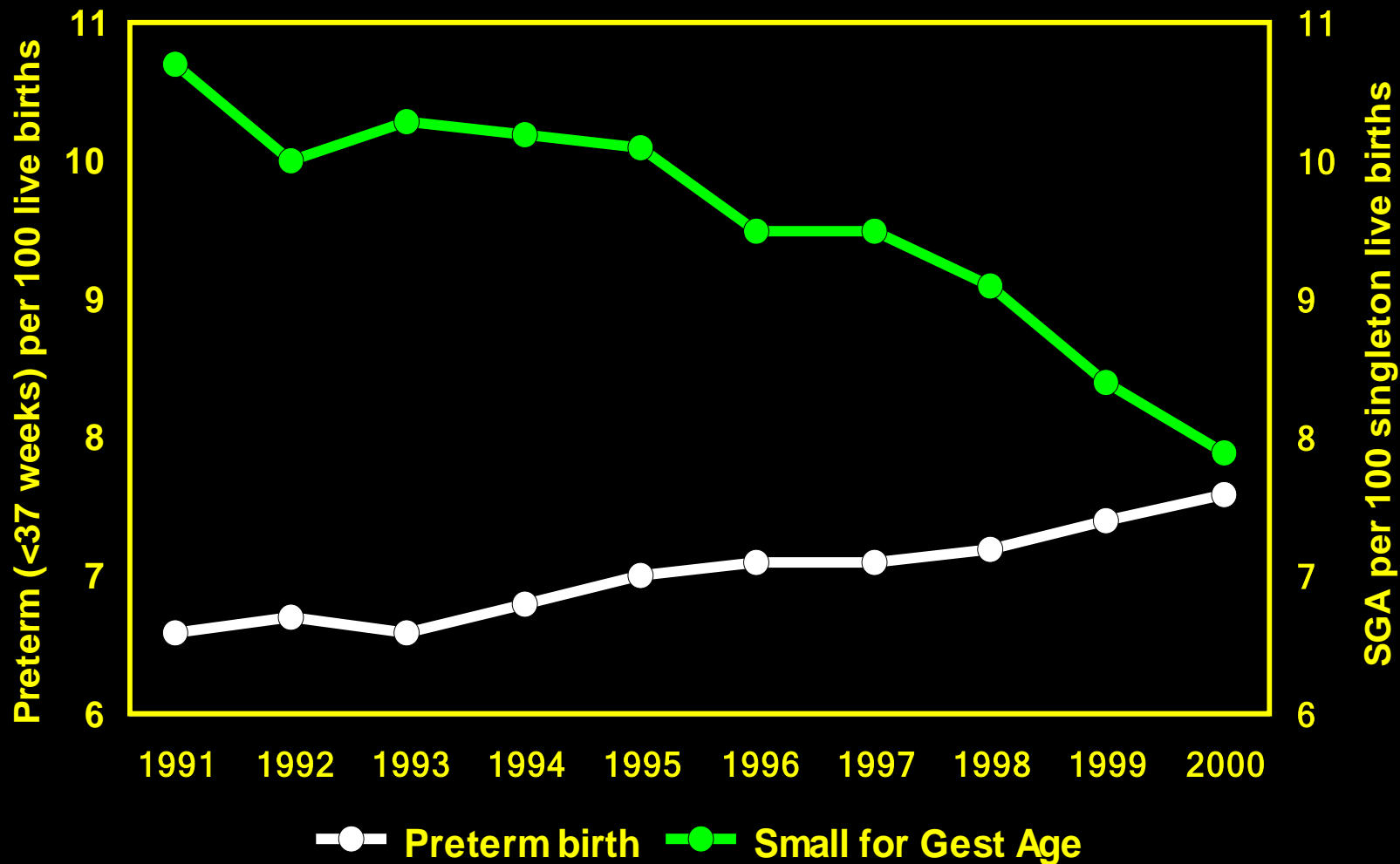
Cf: no low bwt statistics in CPSS Reports

4. Perinatal health in Canada - trends & status

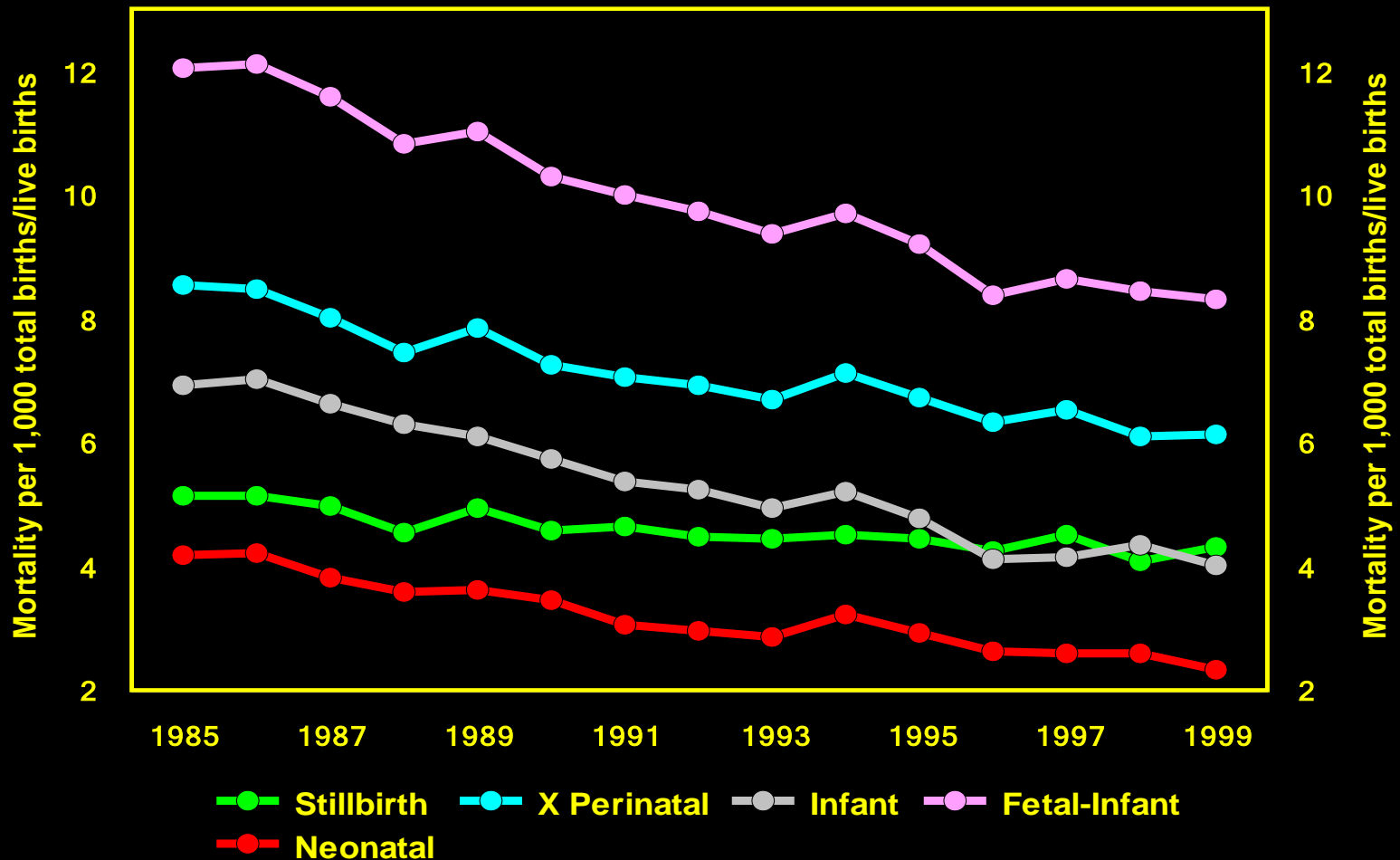
Frequency of multiple births, Canada 1974-99



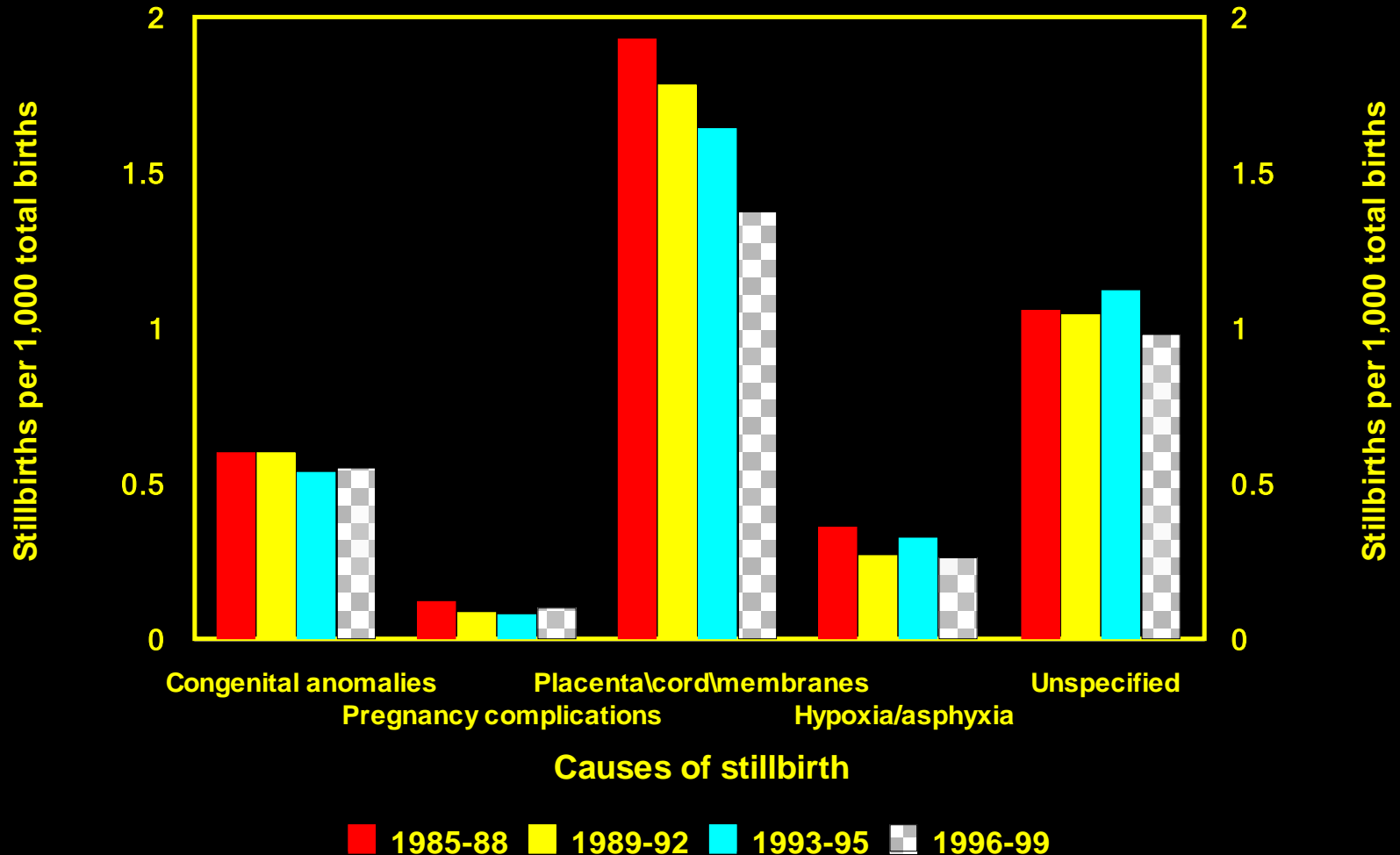
4. Trends in preterm birth & SGA, Canada 1991-2000



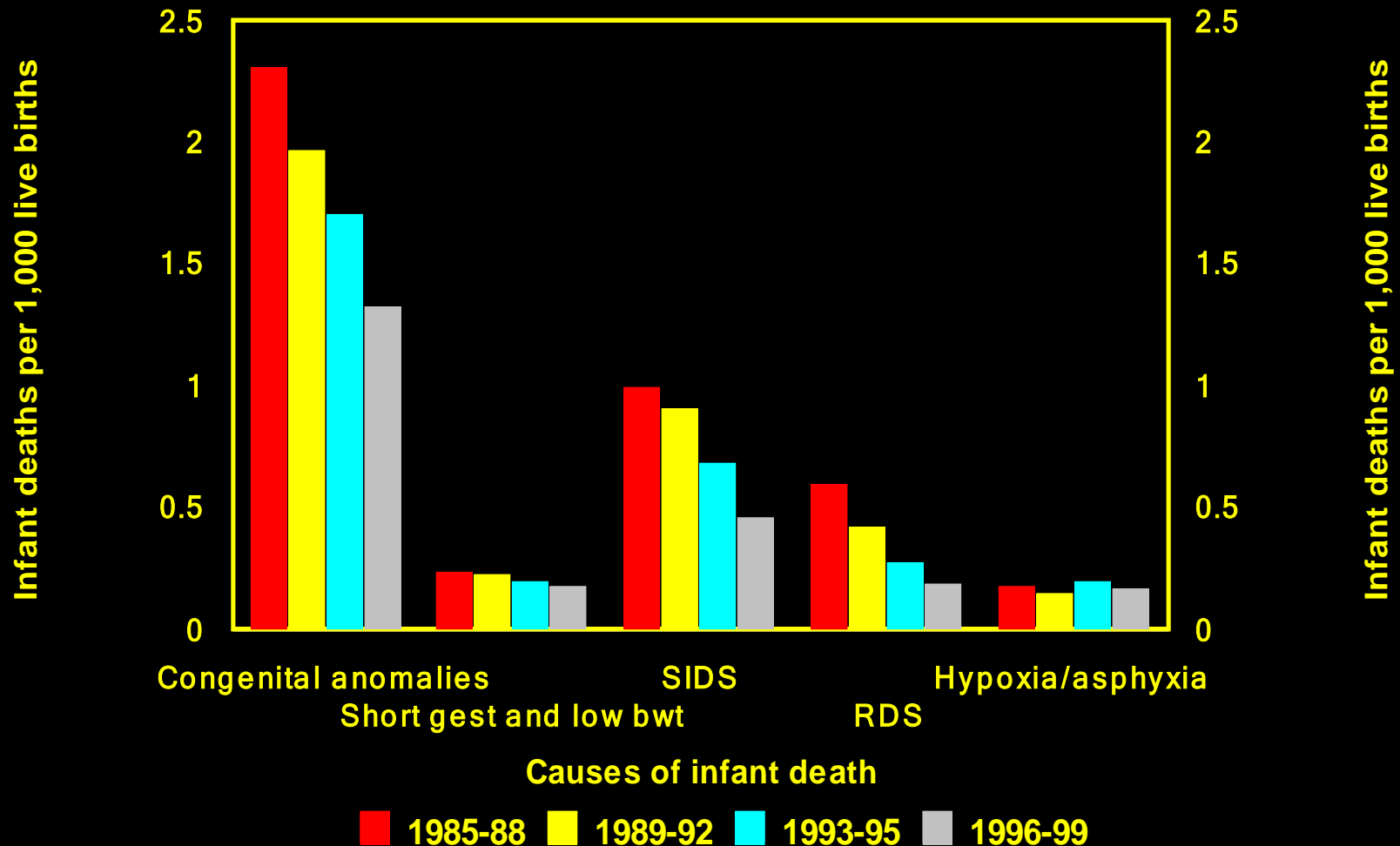
4. Trends in mortality, singletons \leq 500 g, Canada 1985-99



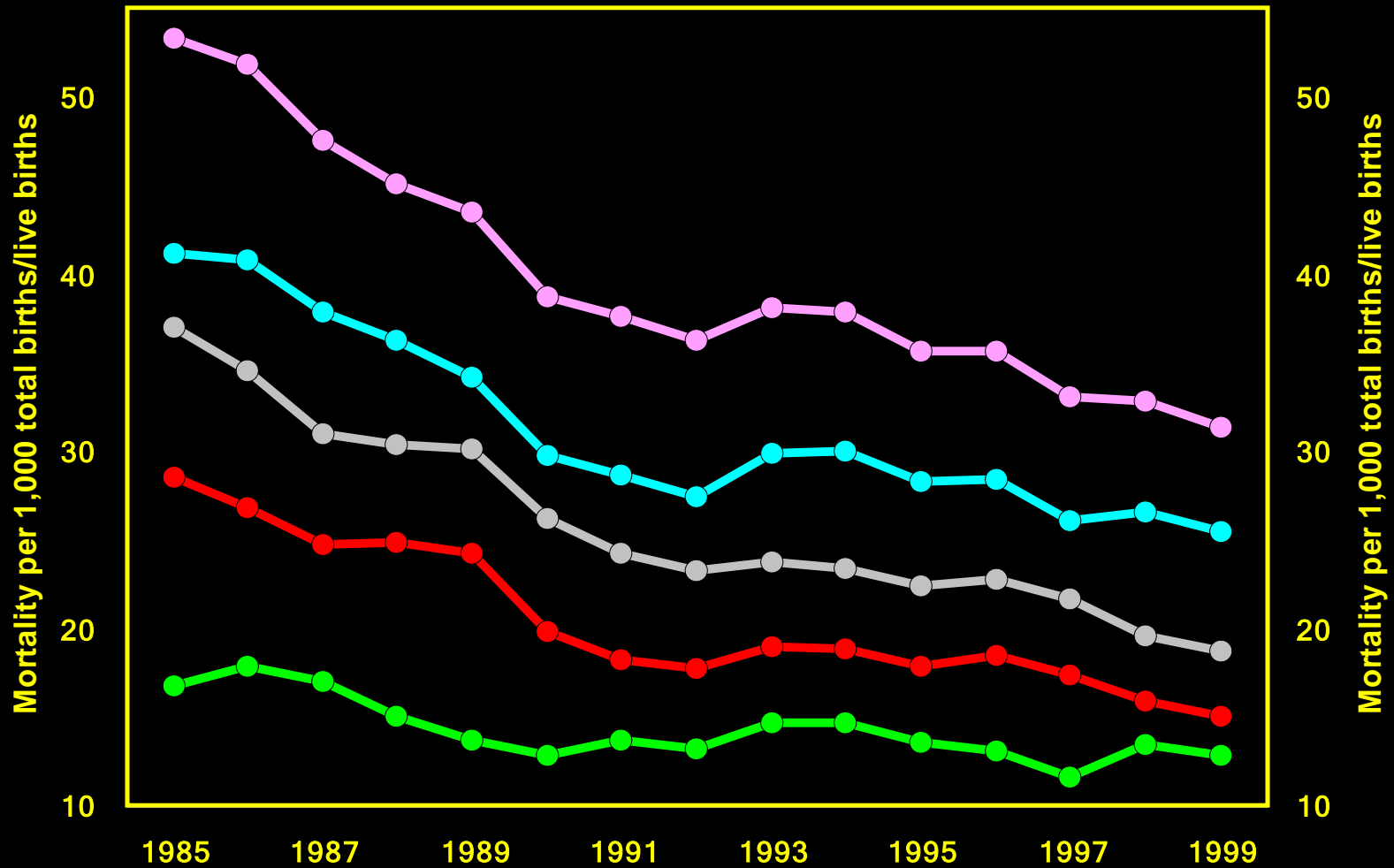
4. Trends in causes of fetal death, singletons ≥ 500 g, Canada 1985-99



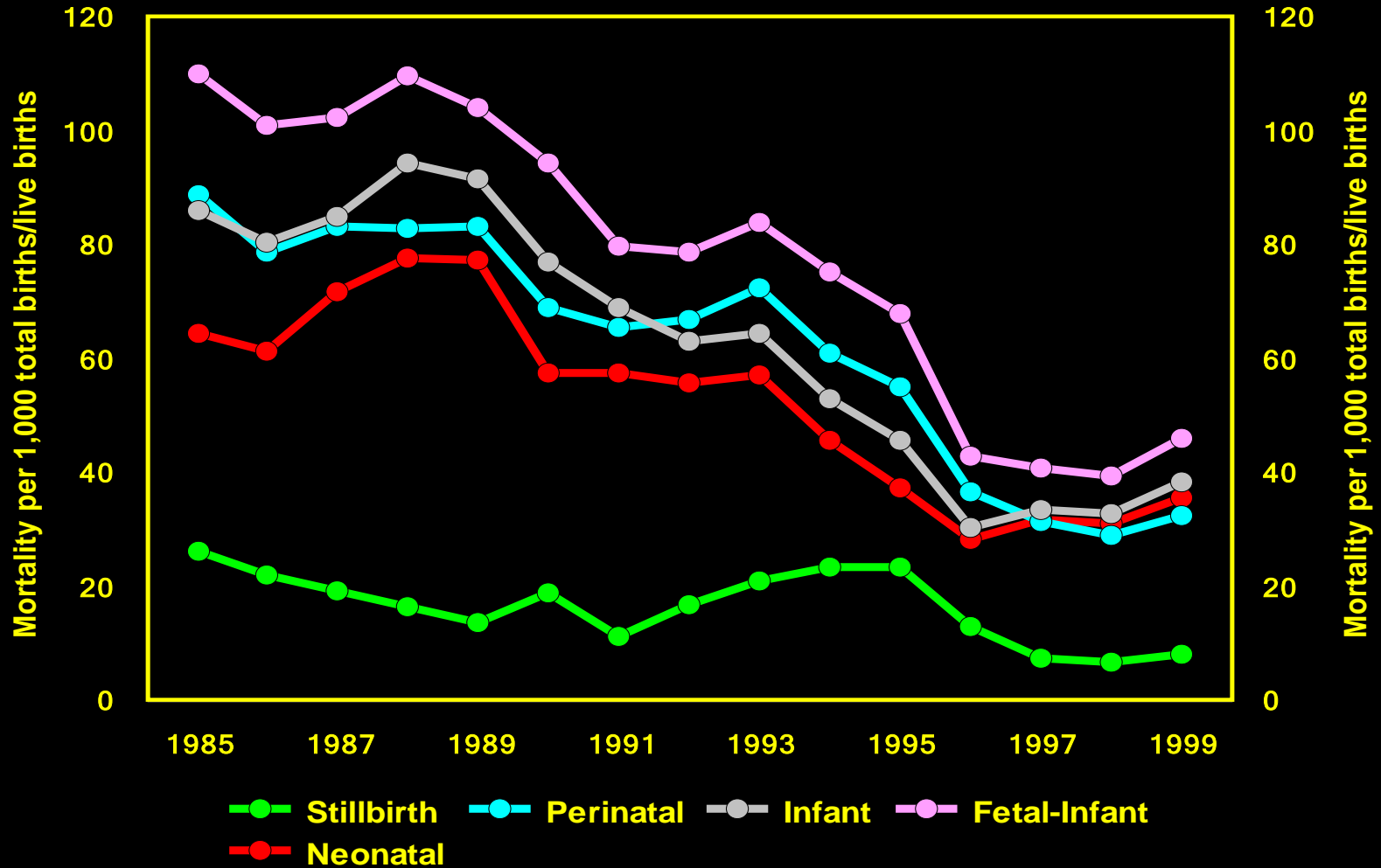
4. Trends in causes of infant death, singletons \leq 500 g, Canada 1985-99



4. Trends in twin mortality 500 g, Canada 1985-99



4. Trends in triplet mortality ≤ 500 g, Canada 1985-99



4. Mortality trends – bottom line

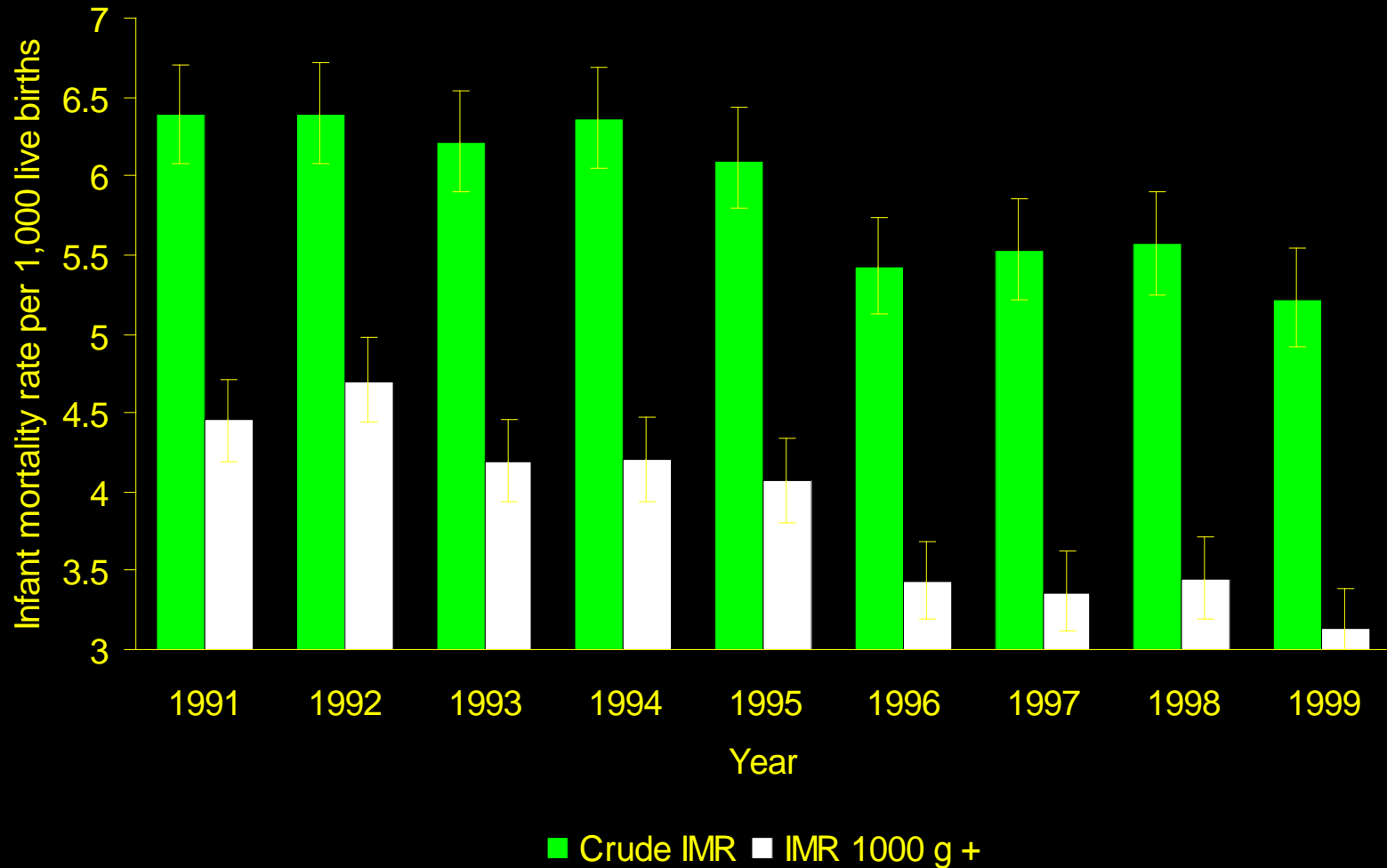
- Declines substantial
- Cause of death patterns as expected
- Province-specific trends and interprovincial comparisons generally reassuring
- Concern re international comparisons – Canada's global IMR ranking has slipped substantially in recent years

5. Current areas of interest

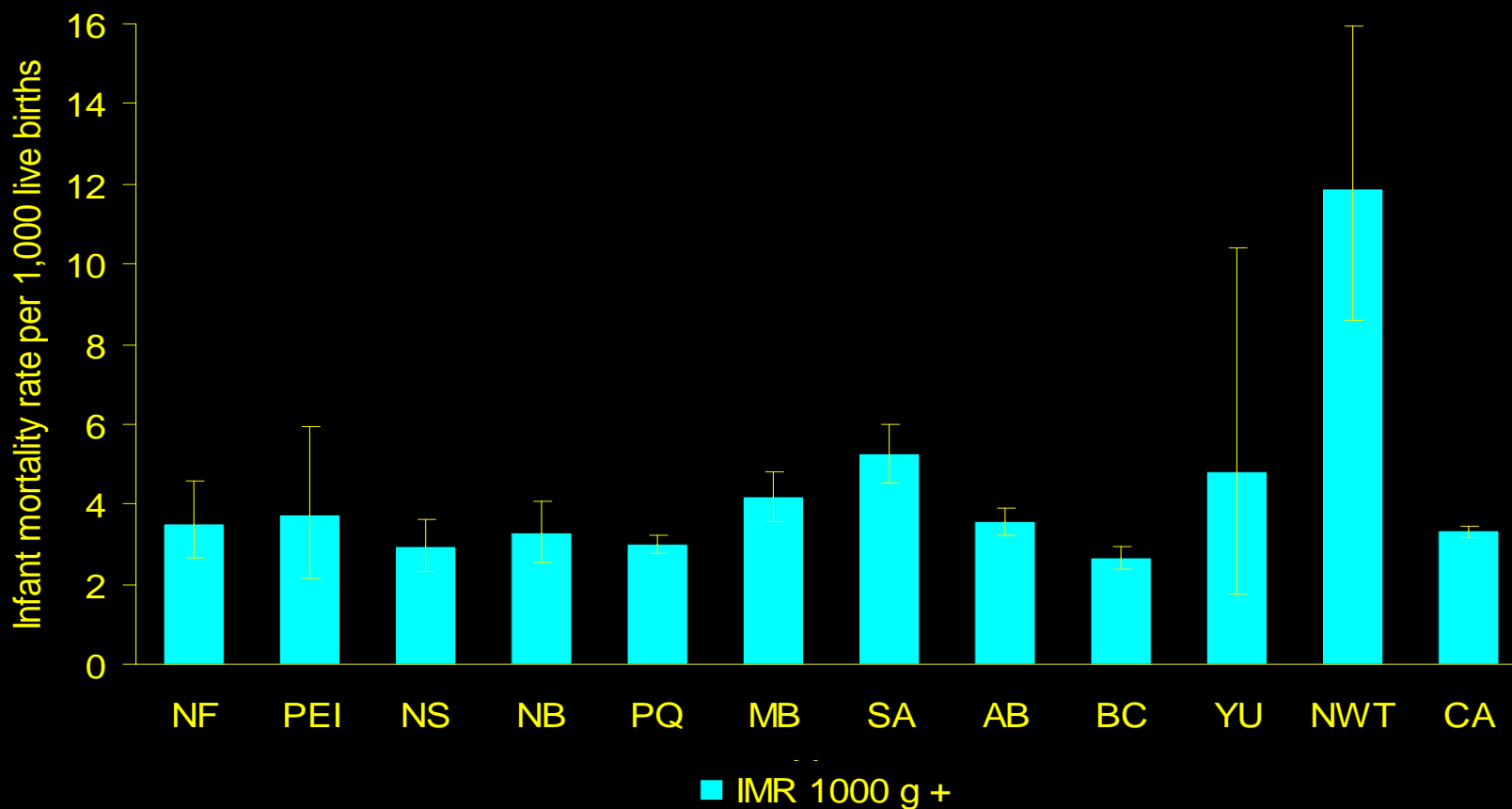
5a. Concern re international comparisons

- Lack of standardization with regard to registration of births at borderline of viability
- 50-fold variation in registration of live births <500 g (Kramer et al PPE 2002)
- WHO advocated comparisons \approx 1,000 g but such estimates are generally unavailable
- CPSS reports provide such estimates and enable international and interprovincial comparisons

5a. Infant mortality \approx 1,000 g, Canada 1991-99



5a. Infant mortality \leq 1,000 g, Canada provinces and territories, 1999



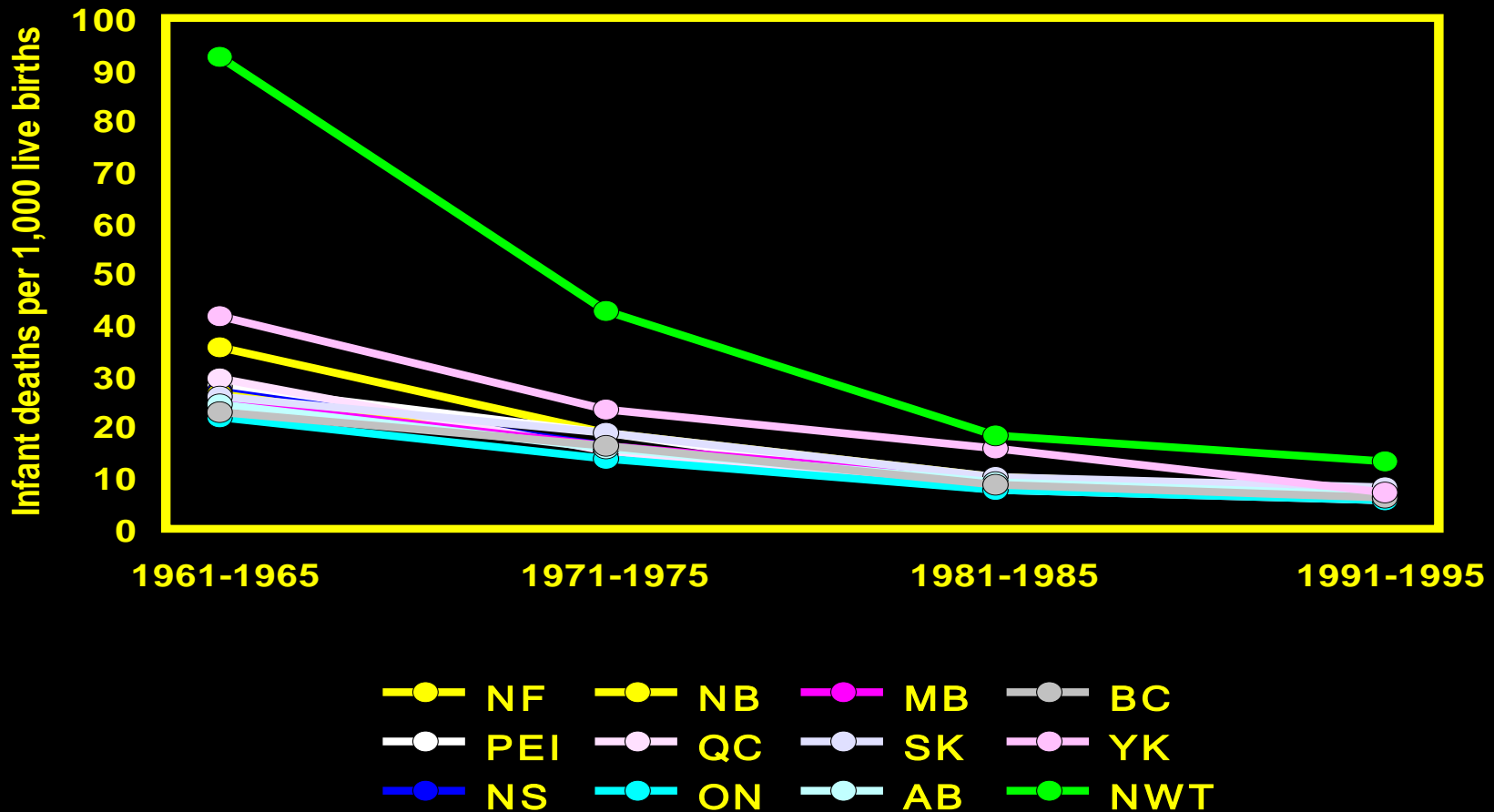
5b. The Matthew effect in health development

Unto every one that hath shall be given, and he shall abundance; but from him that hath not shall be taken away even that which he hath

	Infant mortality		
	1965	1985	% change
Japan	18	6	-66.7
Greece	34	16	-52.9
Mexico	82	50	-39.0
Rwanda	141	127	-9.9
Ethiopia	165	168	+1.8

5b. Infant mortality in Canada, before and after the Medical (universal health) Care Act 1968

(Dzakpasu et al Pediatrics 2000)



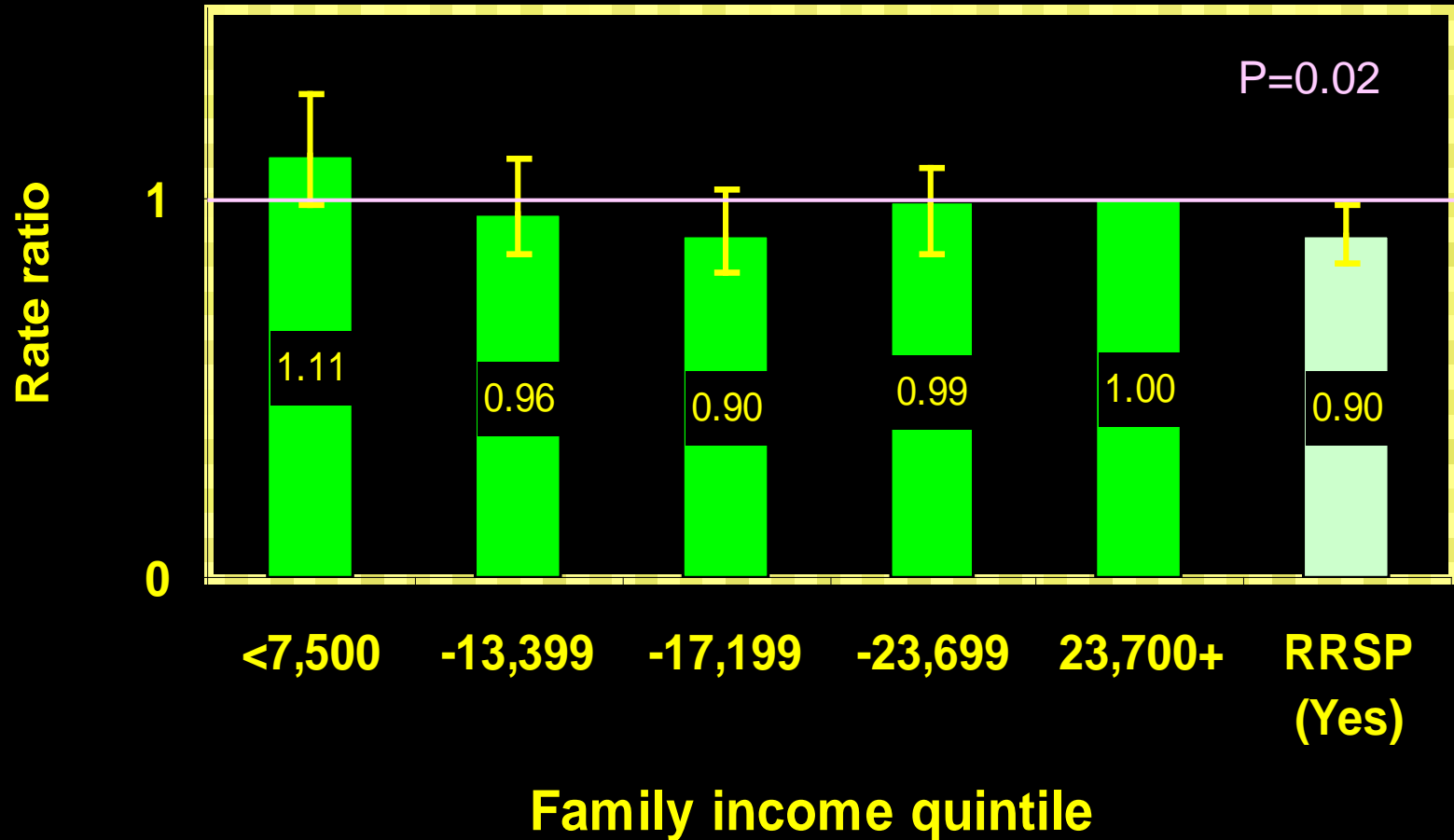
5b. Infant mortality in Canada, before and after the Medical (universal health) Care Act 1968

	Infant mortality		
	1961-65	1991-95	% change
Ontario	22.2	6.07	-72.7
BC	23.0	6.15	-73.2
Nova Scotia	27.2	5.95	-78.1
Yukon	42.0	7.55	-82.0
NWT	92.9	13.22	-85.8

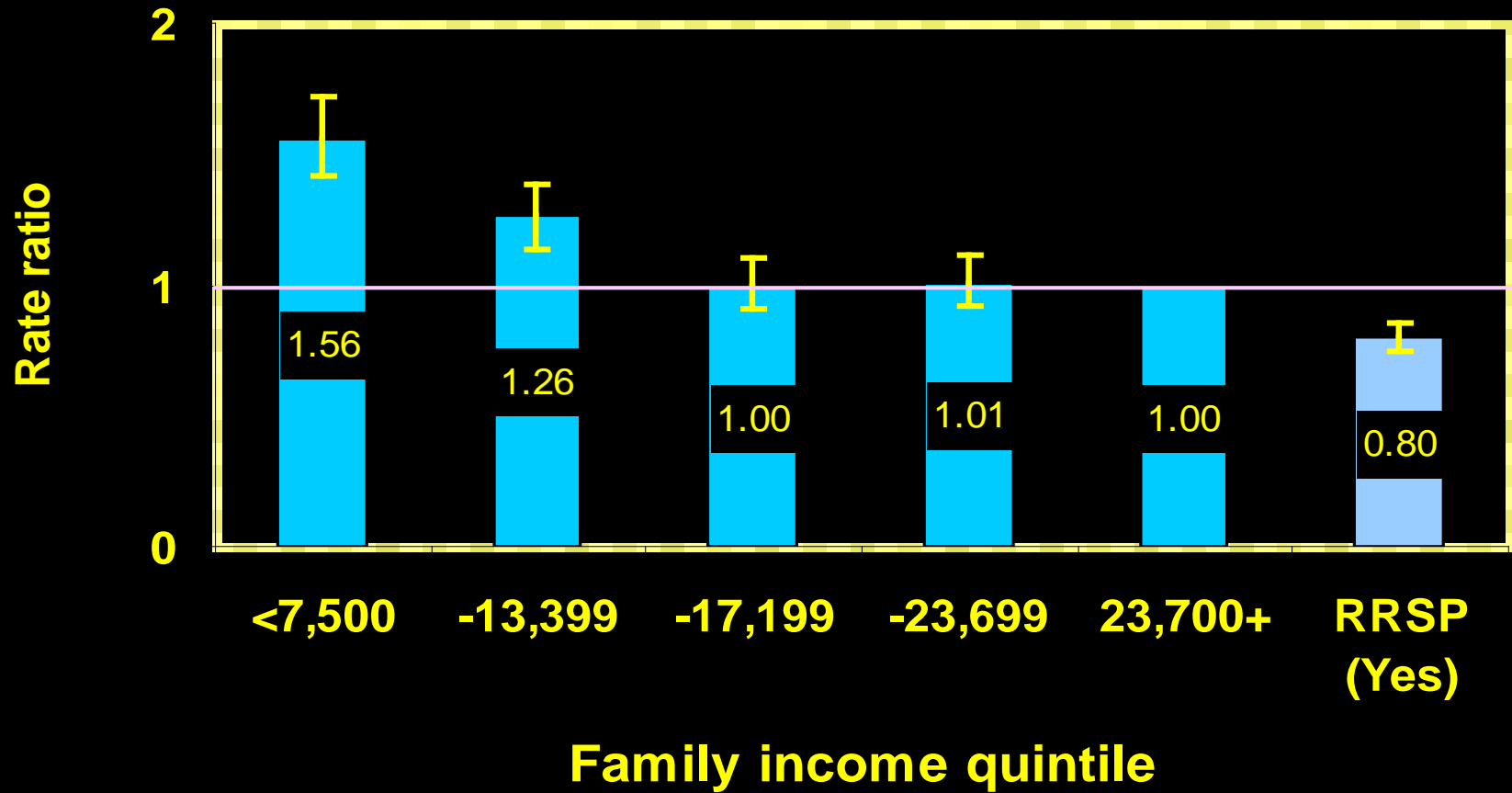
5b. Infant mortality differentials among vulnerable subpopulations

- 2 to 2.5 fold difference in IMR between First Nations peoples and the general population persists
- Bwt and GA data from First Nations, Metis and Inuit populations suggest incomplete registration at borderline of viability - ? larger mortality differentials

5b. Preterm birth <37 weeks Nova Scotia 1988-95



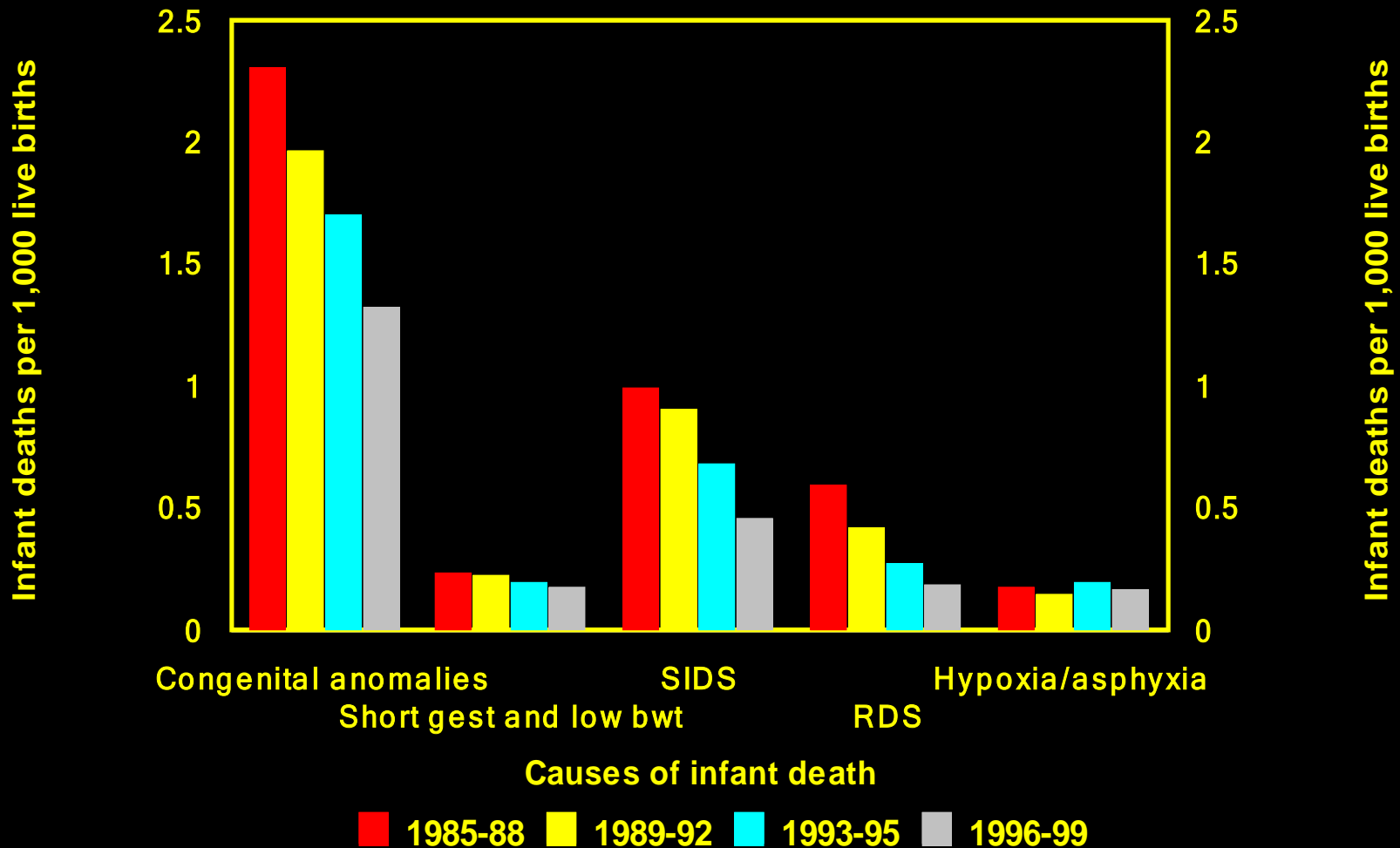
5b. Small for gestational age Nova Scotia 1988-95



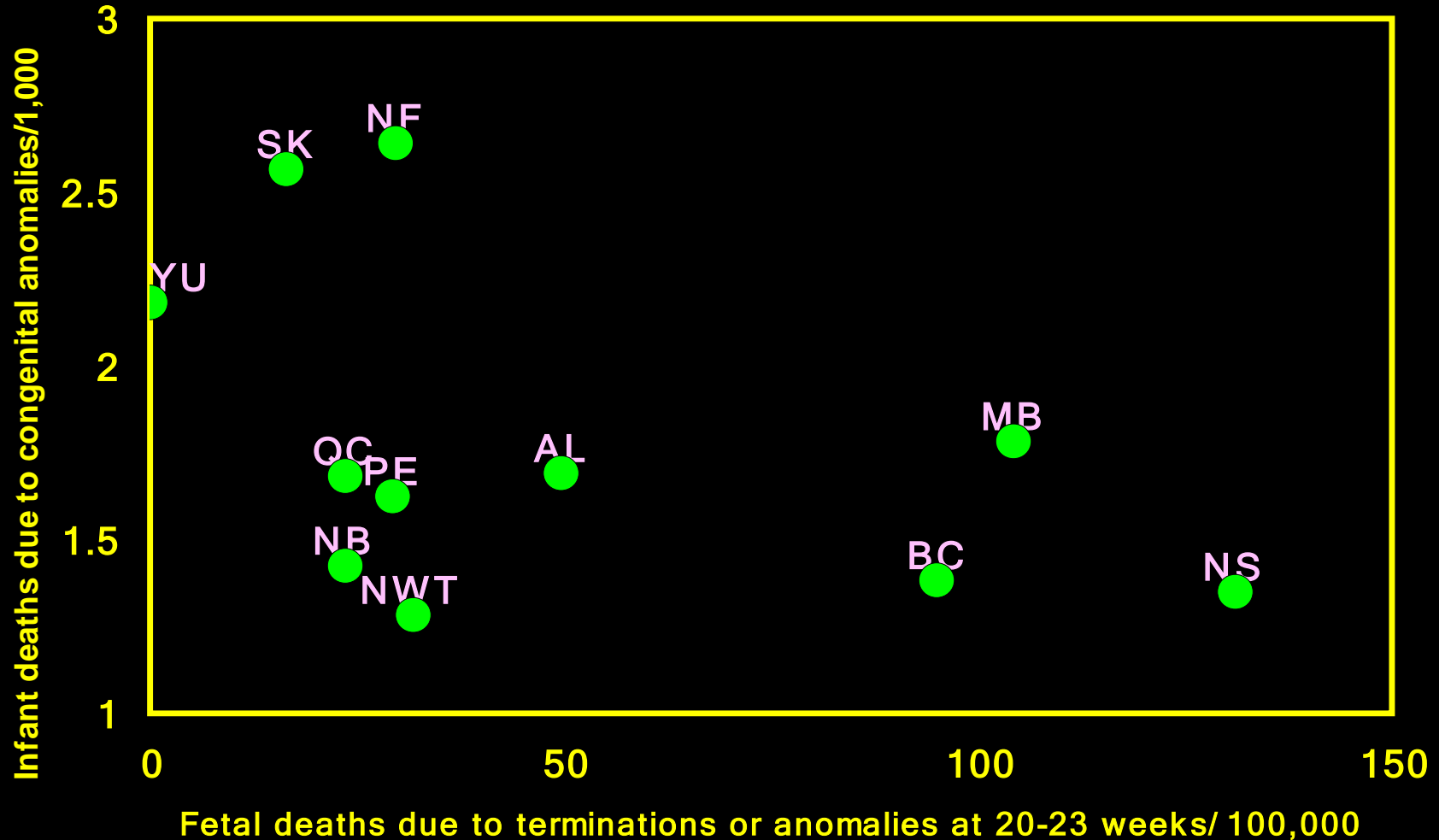
5c and 5d. Recent influences acting to lower infant mortality

- Prenatal diagnosis and termination of pregnancies affected by major congenital malformations
- Increases in medically indicated early delivery (labour induction and/or cesarean delivery)
- Decreases in maternal smoking, effect of folic acid supplementation, etc

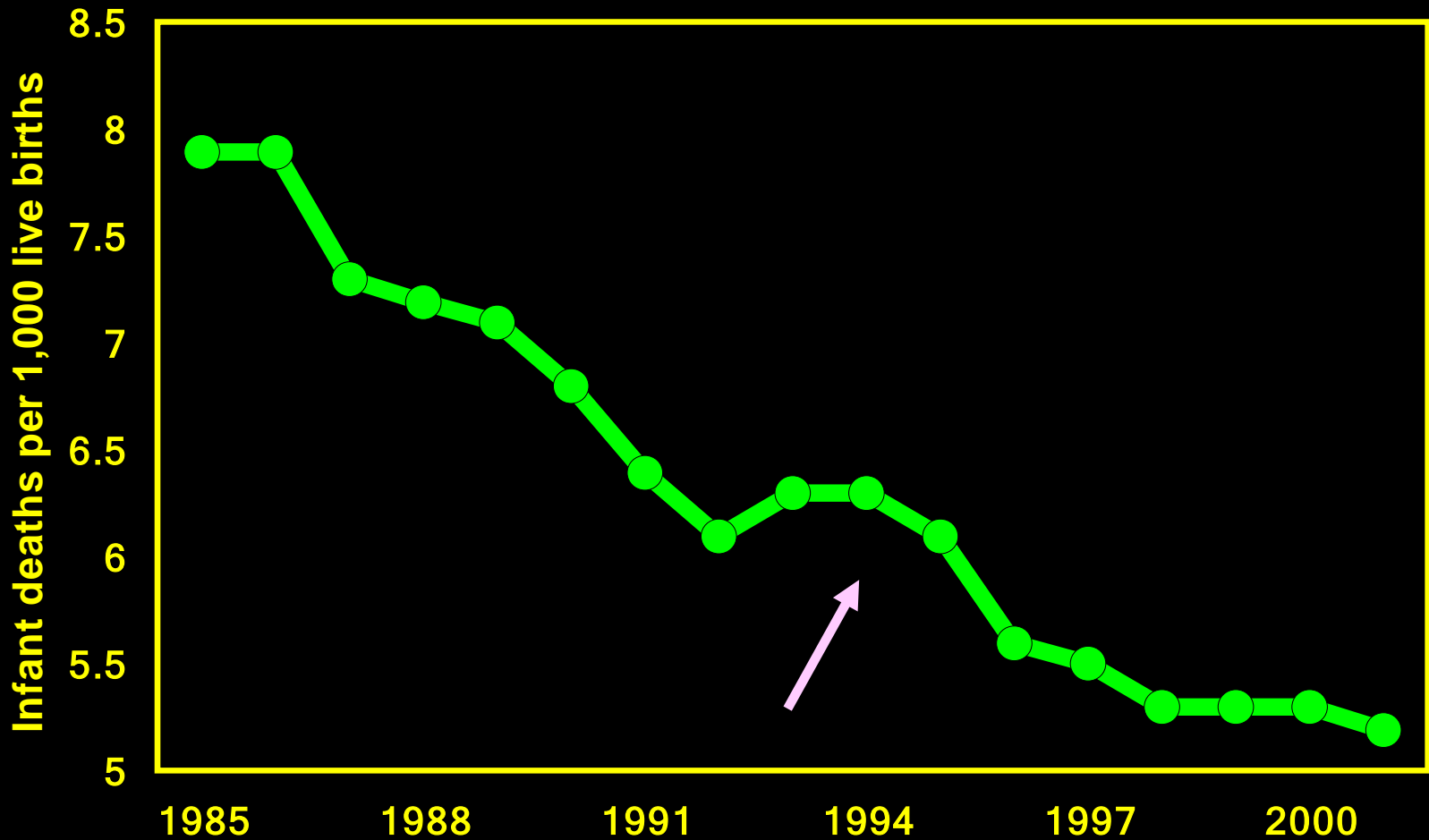
5c. Trends in causes of infant death, singletons $\leq 500\text{ g}$, Canada 1985-99



5c. Infant vs fetal deaths due to cong. anomalies (Liu et al JAMA 2002)



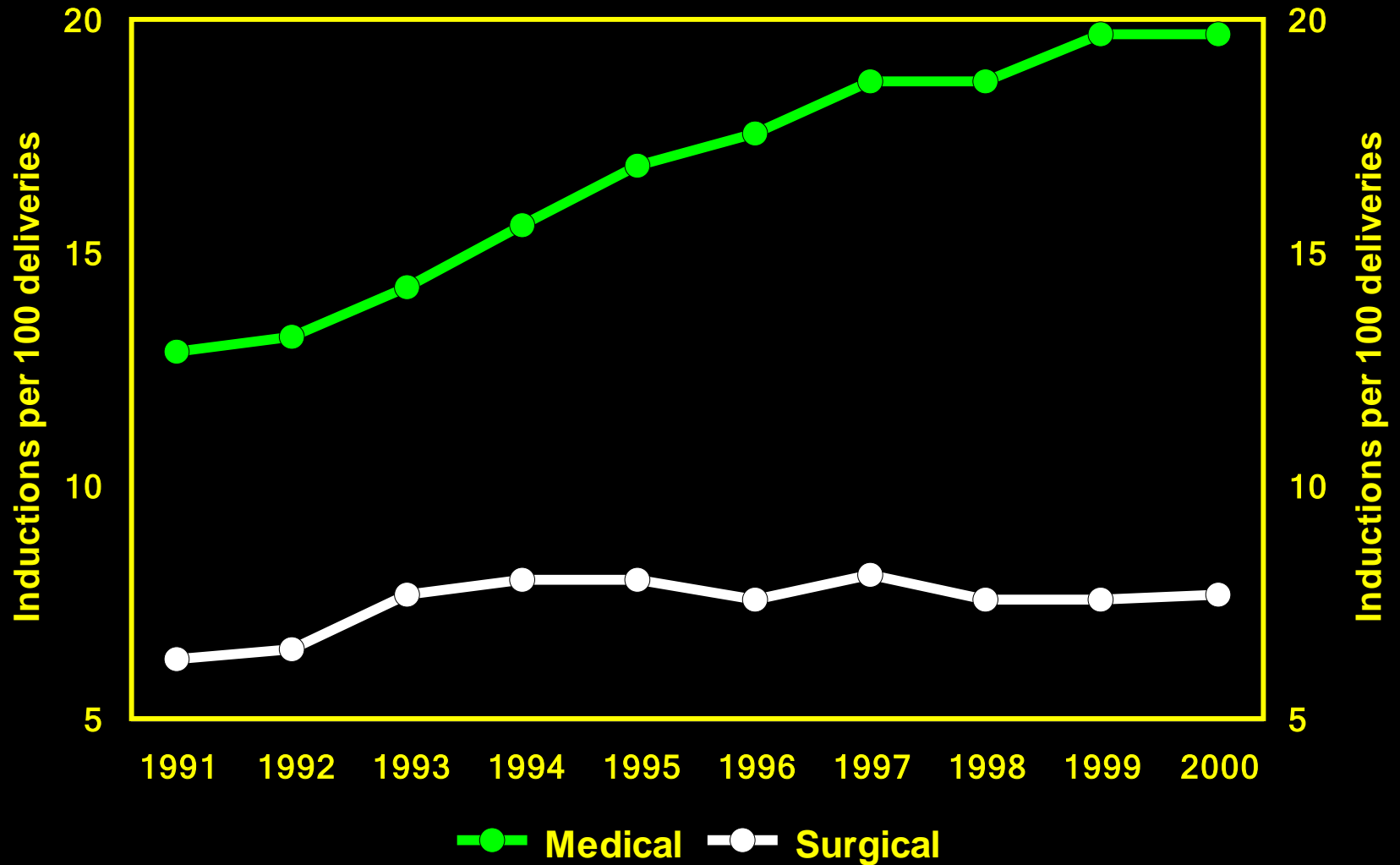
5c. Was the 1993 upturn in IMR in Canada due to prenatal diagnosis & termination?



5d. Increases in medically indicated early delivery

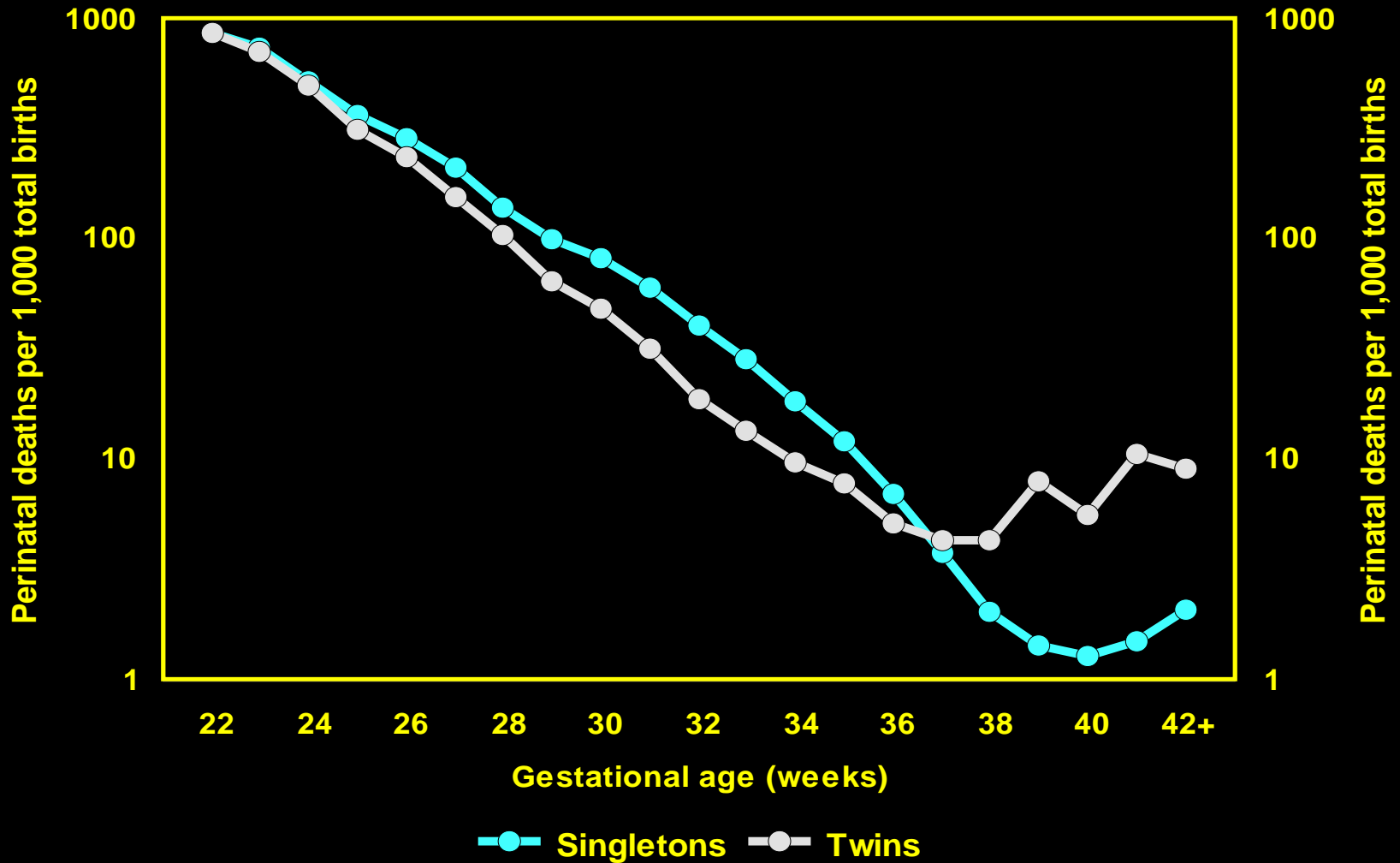
- Medically indicated early delivery is the cornerstone of modern obstetrics
- Rates of labour induction and/or cesarean delivery have increased dramatically over the last 2 decades
- Linked to newer technologies including antenatal corticosteroids use, surfactant use, better methods of ventilation, etc.

5d. Increases in labour induction, Canada 1991-2000

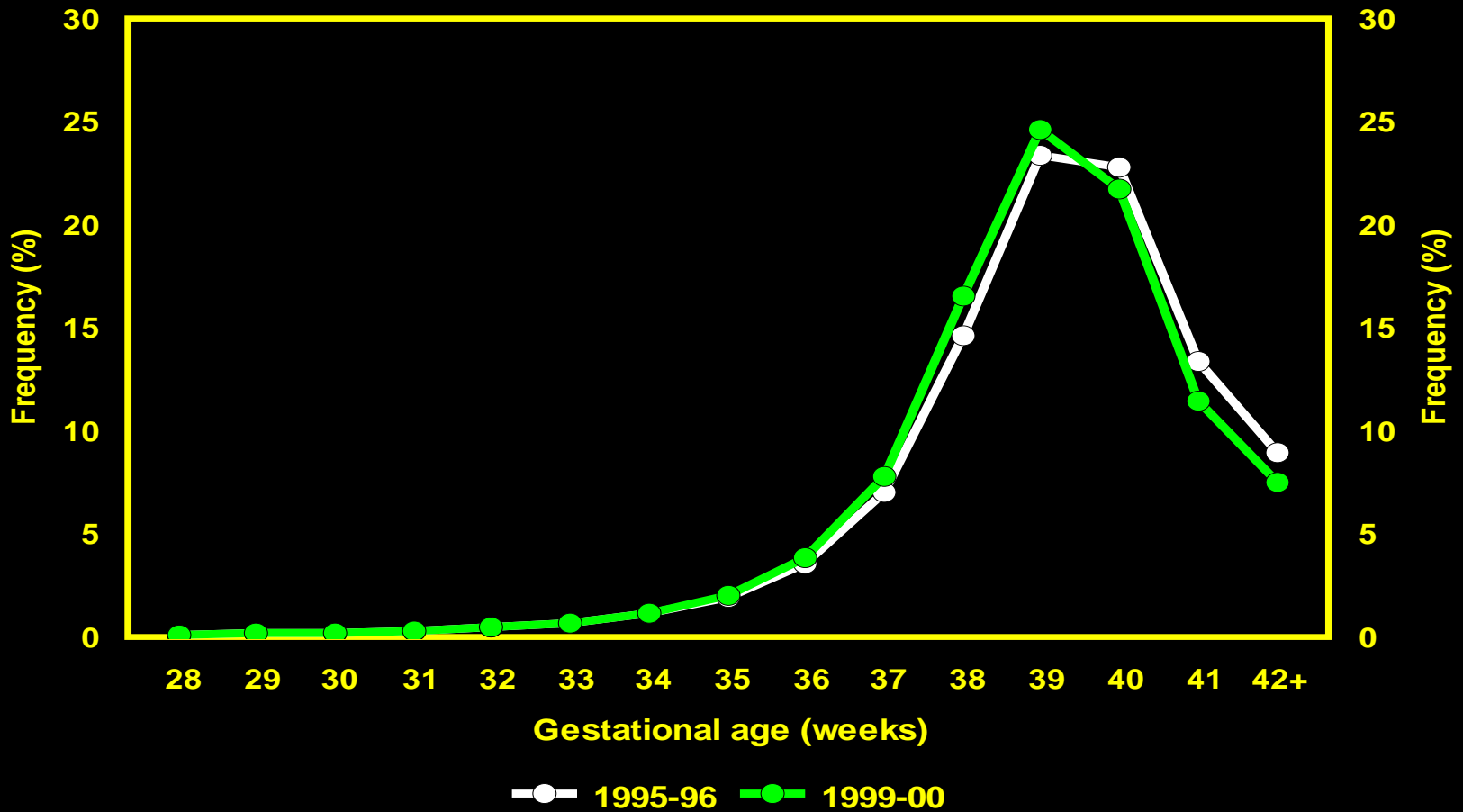


5d. Mortality decreases with increasing GA

United States 1999-2000 excludes deaths due to Cong. anomalies

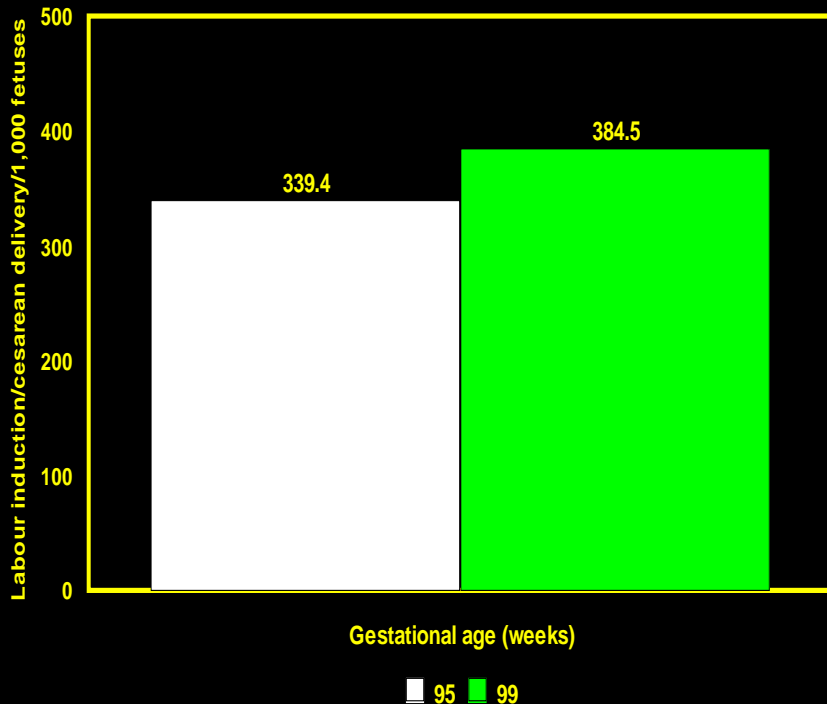


5d. Effect of increases in early delivery on the gestational age distribution, US singletons 1995-96 vs 1999-00



5d. Singletons \leq 28 weeks, U.S. 95-96 vs 99-00 (excludes death due to CA)

Labour induction/cesarean

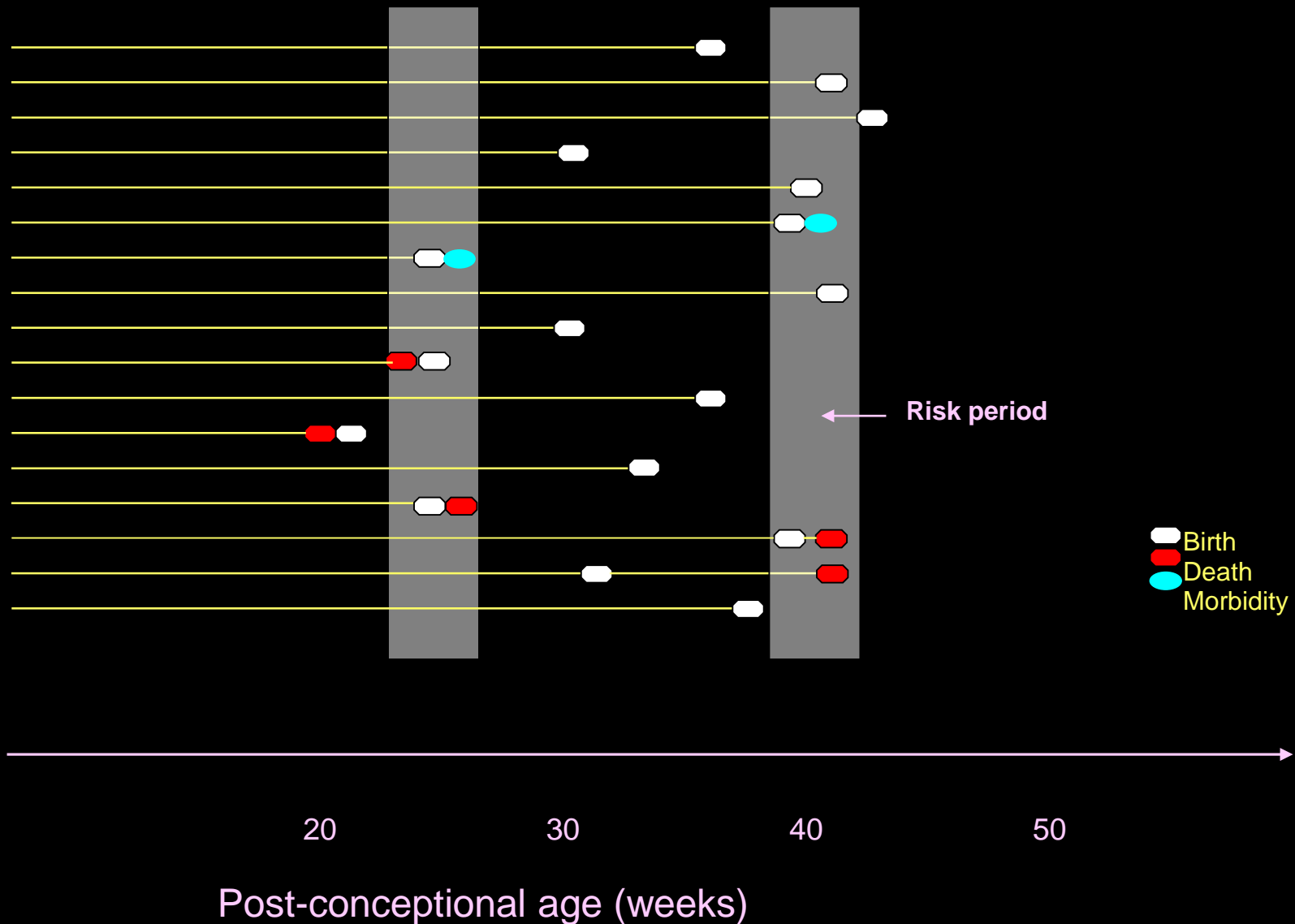


Perinatal death

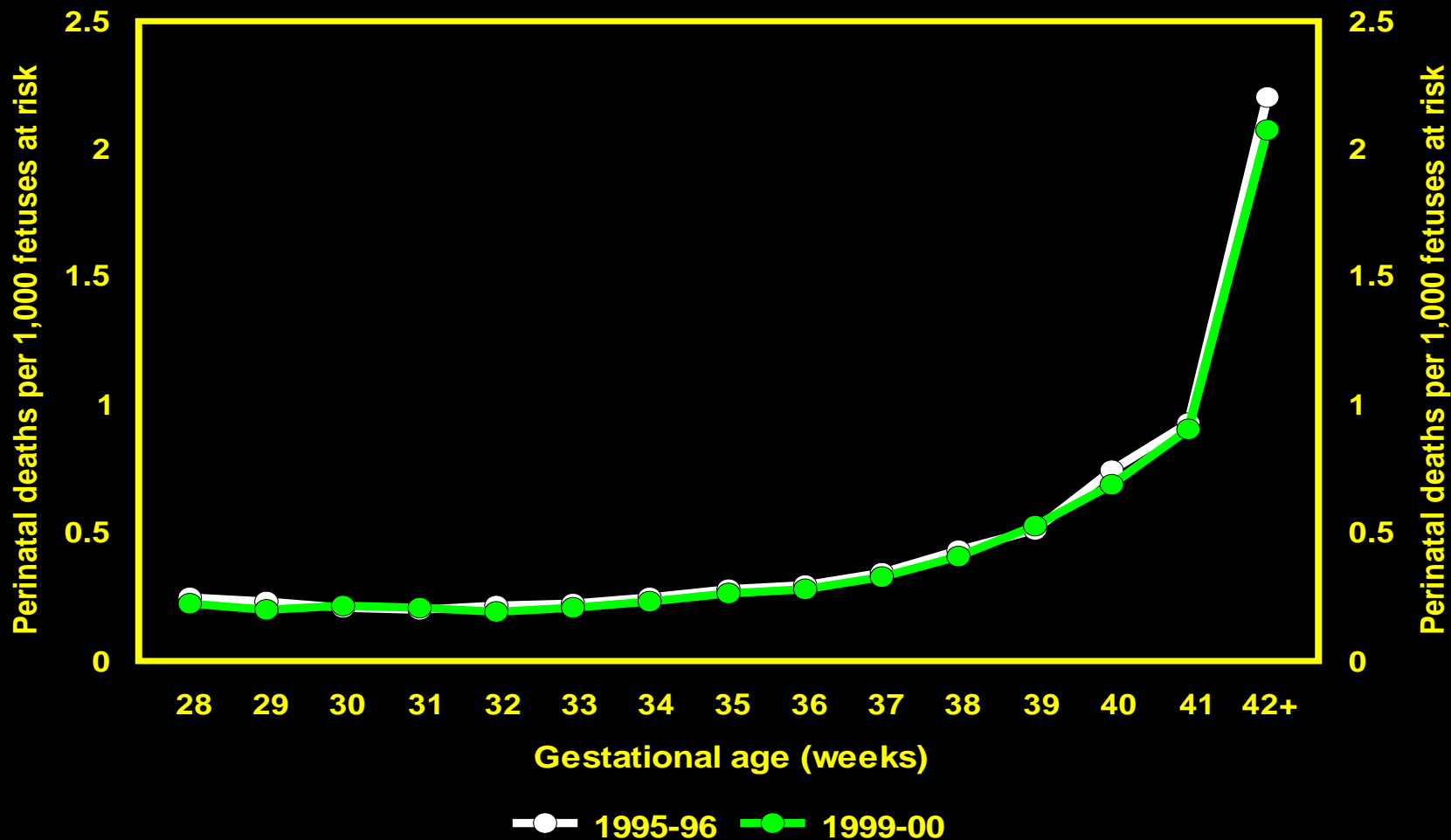


5d. Obstetric model

Fetuses at risk of perinatal mortality or serious morbidity



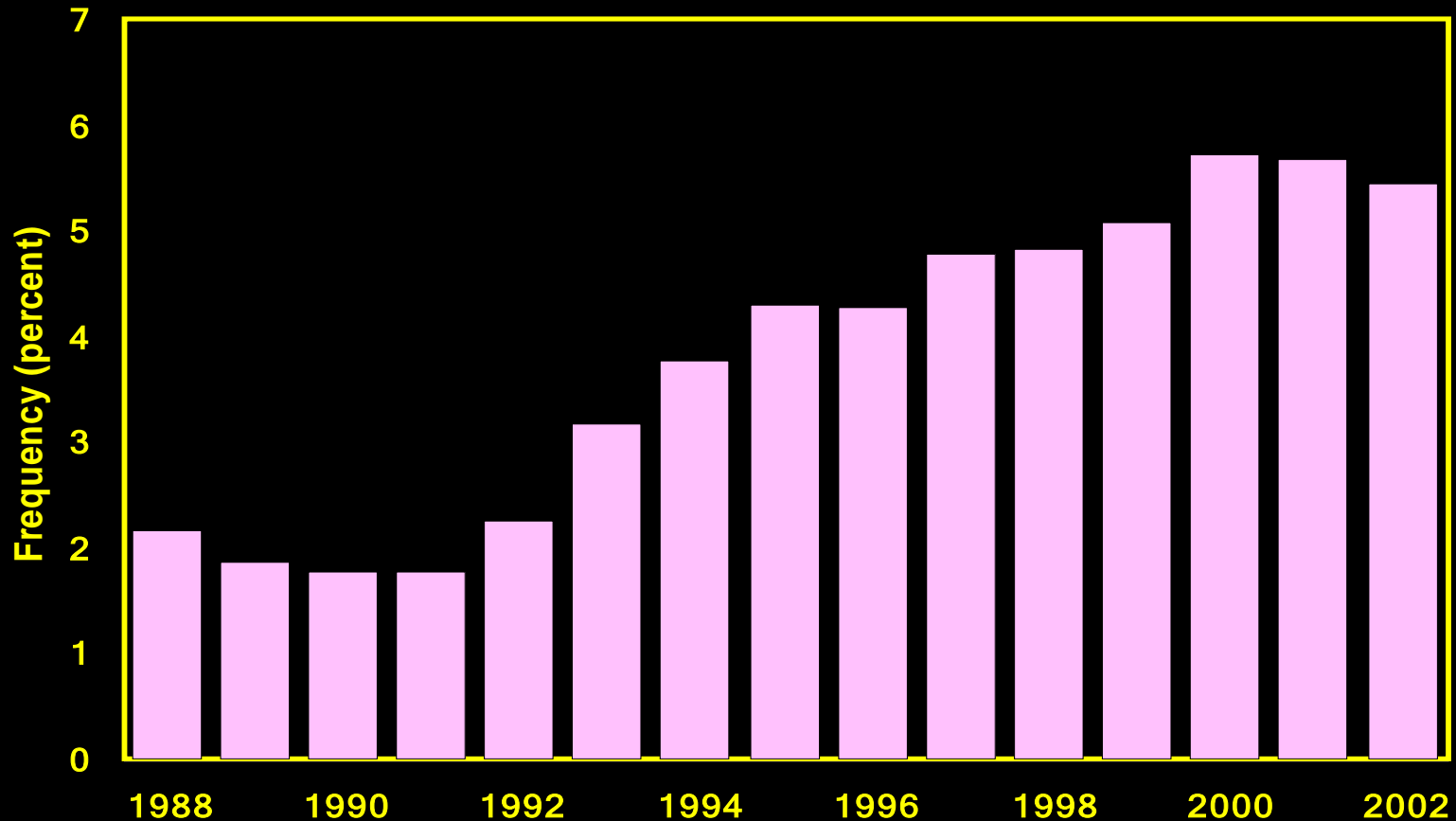
5d. Trends in perinatal death, singletons, United States 1995-96 vs 1999-00 (excludes death due to cong. anomalies)



5e. Factors acting to increase perinatal mortality

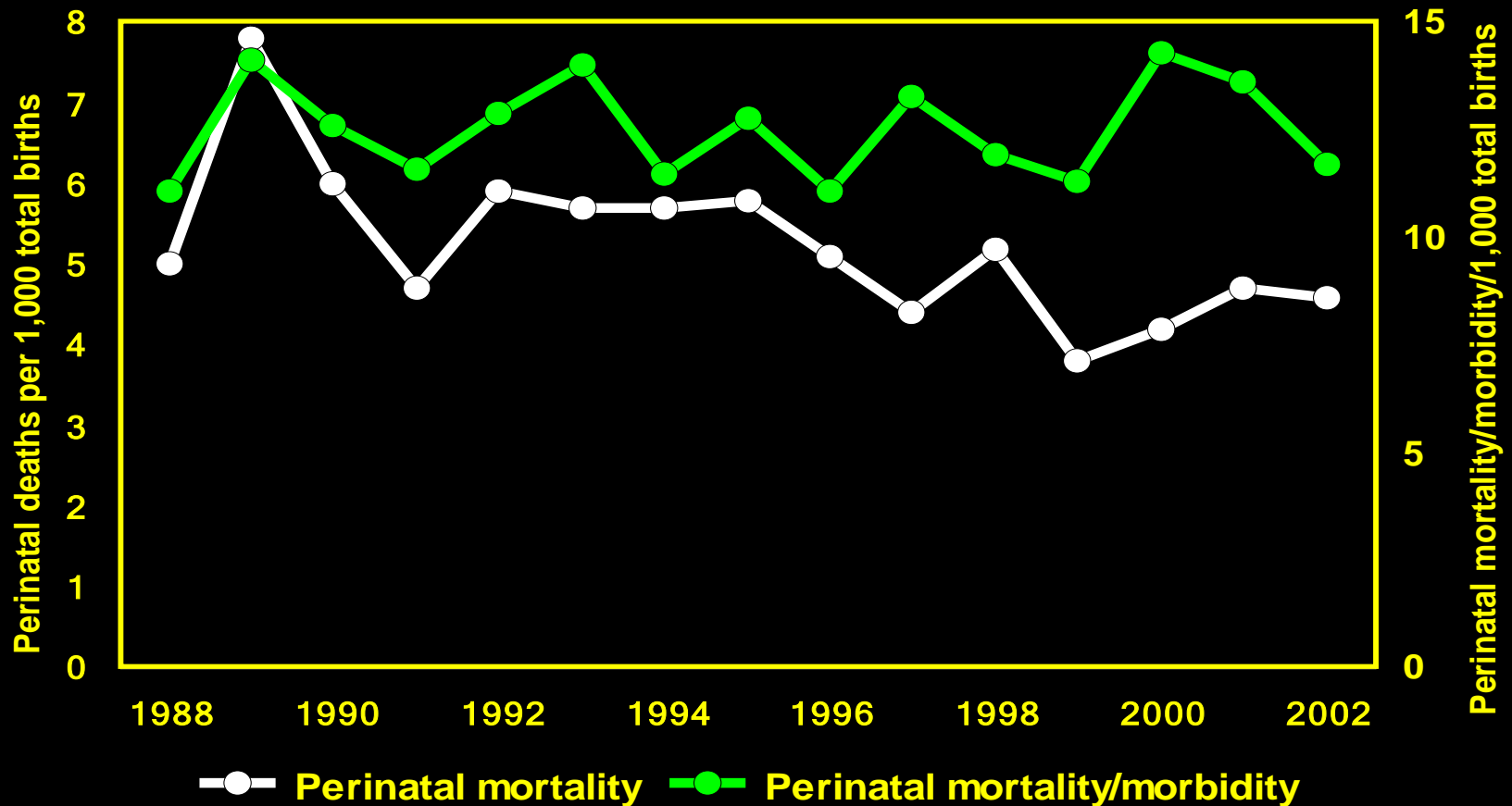
- Increases in older maternal age
- Increases in obesity
- Increases in the fecundity of women with chronic diseases

5e. Mothers with chronic medical disease Nova Scotia, Canada 1988-2002



Not including diabetes mellitus and hypertension

5f. Trends in perinatal mortality and perinatal mortality/serious neonatal morbidity, Singletons \geq 500 g, Nova Scotia, Canada 1988-2002



6. Re the Canadian Perinatal Surveillance System (CPSS)

- Initiative of Health Canada

Contact address CPSS@hc-sc.gc.ca

- Membership includes federal and provincial stakeholders, health professional organizations, advocacy groups and university based researchers
- Focus on Fetal and infant health
 - Maternal Health
 - Maternity experiences
- Publishes routine surveillance reports
(see Canadian Perinatal Health Report 2003
<http://www.hc-sc.gc.ca/pphb-dgspsp/rhs-ssg/index.html>)