- 7 Albaum MN, Hill LC, Murphy M, Li YH, Fuhrman CR, Britton CA, et al. Interobserver reliability of the chest radiograph in community-acquired pneumonia. PORT Investigators. *Chest* 1996;110:343-50.
- 8 Alland D, Kalkut GE, Moss AR, McAdam RA, Hahn JA, Bosworth W, et al. Transmission of tuberculosis in New York city. An analysis by DNA fingerprinting and conventional epidemiologic methods. *N Engl J Med* 1994;330:1710-6.
- 9 Coblenz CL, Babcock CJ, Alton D, Riley BJ, Norman G. Observer variation in detecting the radiologic features associated with bronchiolitis. *Invest Radiol* 1991;26:115-8.
- 10 Du Toit G, Swingle G, Iloni K. Observer variation in detecting lymphadenopathy on chest radiography. *Int J Tuberc Lung Dis* 2002;6:814-7.
- 11 Tudor GR, Finlay DB. Error review: can this improve reporting performance? *Clin Radiol* 2001;56:751-4.
- 12 Kwong JS, Carignan S, Kang EY, Muller NL, Fitzgerald JM. Miliary tuberculosis. Diagnostic accuracy of chest radiography. *Chest* 1996;110:339-42.
- 13 Dhingra R, Finlay DB, Robinson GD, Liddicoat AJ. Assessment of agreement between general practitioners and radiologists as to whether a radiation exposure is justified. *Br J Radiol* 2002;75:136-9.
- 14 Zitting AJ. Prevalence of radiographic small lung opacities and pleural abnormalities in a representative adult population sample. *Chest* 1995;107:126-31.

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Temporal trends in multiple births after in vitro fertilisation in Sweden, 1982-2001: a register study

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During the 20 years since the first child was born in Sweden after in vitro fertilisation, clinical policy has changed. During the early 1990s, the clinics performing in vitro fertilisation and the National Board of Health and Welfare agreed to reduce the number of embryos transferred to the uterus during in vitro fertilisation from three to two. Here, we describe the changes in multiple birth rates that have resulted from this change and their impact on the rate of preterm birth. In future papers we intend to describe maternal and child characteristics in greater detail.

Participants, methods, and results

In Sweden 17 hospitals or private clinics perform in vitro fertilisation. The National Board of Health and Welfare requested information from these laboratories on all women who had undergone in vitro fertilisation and who had had a baby or whose pregnancy outcome was not known. By linking these data with the Swedish medical birth register, we identified infants born from 1982 to 2001.^{1 2} This register covers nearly all deliveries in Sweden and is based on copies of medical documents from the antenatal care, the delivery, and the paediatric examination of newborn infants.

We compared the infants born after in vitro fertilisation and identified in the registry with all infants

Changes in percentage of deliveries after in vitro fertilisation that resulted in birth of twins, by year of birth (vertical bars are 95% confidence intervals)

What is already known on this topic

Pregnancies occurring after in vitro fertilisation are characterised by high rates of multiple births and, as a consequence, high rates of preterm births

During the 1990s Swedish fertility clinics agreed to reduce from three to two the number of embryos transferred to the uterus during in vitro fertilisation

What this study adds

The rate of multiple births after in vitro fertilisation increased to a maximum of 29% in 1991 but fell to 18.5% by 2001, resulting in a 70% reduction of preterm births

born in Sweden and recorded in that registry (2 039 943 during 1982-2001). We performed statistical analyses using the Mantel-Haenszel technique, with adjustment for various putative confounders. We expressed risks as odds ratios and calculated 95% confidence intervals with a test-based method (according to Miettinen).

We studied a total of 13 261 births after in vitro fertilisation, which resulted in 16 280 infants registered. The figure shows the changes in percentage of twin deliveries according to year of birth, with the first seven years added because of low numbers. The twinning rate increased to a maximum of 29% in 1991 and then decreased steadily to 18.5% in 2001. The annual number of triplet deliveries after in vitro fertilisation varied between 11 and 32 during 1992-6, and between three and seven after 1997. All seven sets of quadruplets were born before 1994.

The impact of the reduction of multiple births on the rate of preterm births is marked. In 1991, the crude odds ratio for preterm birth was 9.41 (95% confidence interval 7.58 to 11.67) and the odds ratio adjusted for maternal age (in 5 year groups, <20, 20-24, etc), parity

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(1–≥ 4), smoking (none, < 10, ≥ 10 cigarettes/day), and years of involuntary childlessness were 4.63 (3.62 to 5.92). The corresponding odds ratios in 2001 were 2.15 (1.76 to 2.62) and 1.33 (1.12 to 1.57). The risk for preterm birth after in vitro fertilisation was thus reduced by 77% (crude odds ratio) and 72% (adjusted odds ratio).

Comment

The rate of high order multiple births after in vitro fertilisation declined markedly during the 1991–2001, and the twinning rate decreased by about 40% from a maximum of 29% in 1991 to 18.5% in 2001. At the same time, the population twinning rate increased. The European twinning rate after in vitro fertilisation was 24.4% in 2000.³ The declining rate of multiple births affected the risk of preterm infants, which declined by over 70%, and improved neonatal outcome.

The change in clinical policy in the early 1990s that initiated these changes was reducing from three to two the number of embryos transferred to the uterus during in vitro fertilisation. At present, the number of embryos transferred is being reduced further, from two

to one, and a further reduction in multiple births is to be expected whereas the pregnancy rate seems to be little affected.^{4 5}

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- 1 Cnattingius S, Ericson A, Gunnarskog J, Källén B. A quality study of a medical birth registry. *Scand J Soc Med* 1990;18:143–8.
- 2 Centre for Epidemiology, Swedish National Board of Health and Welfare. *The Swedish Medical Birth Registry—a summary of content and quality*. Stockholm: Swedish National Board of Health and Welfare, 2003. (www.sos.se/FULLTEXT/112/2003-112-3/2003-112-3.pdf)
- 3 Assisted reproductive technology in Europe, 2000. Results generated from European registers by ESHRE. *Hum Reprod* 2004;19:490–503.
- 4 Tiitinen A, Unkilakallio L, Haltunen M, Hydén-Granskog C. Impact of elective single embryo transfer on the twin pregnancy rate. *Hum Reprod* 2003;18:1449–53.
- 5 Thurin A, Hausken J, Hillensjö T, Jablonowska B, Pinborg A, Strandell A, et al. Elective single-embryo transfer versus double-embryo transfer in in vitro fertilization. *N Engl J Med* 2004;351:2392–402.

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When I use a word ...

Rabid responses

At last the *BMJ* has realised that too many rapid responses are actually rabid responses (*BMJ* 2005;330:1284). But Grimm's law predicts it.

The brothers Grimm, Jakob Ludwig and Wilhelm Karl, are best known for the collection of fairy tales that bears their name, first published in two volumes in 1812 and 1814 under the title *Kinder- und Hausmärchen*, with a third volume added in 1822. The tales have enthralled children ever since, but the brothers collected them as an act of serious scholarship, consulting mediaeval manuscripts and talking to villagers and peasants in the districts of Hesse and Hanau and transcribing their tales.

The brothers were also eminent philologists, and Jakob's work is commemorated in Grimm's law. That it is called Grimm's law confirms another law, that of Non-Original Malappropriate Eponymous Nomenclature (NOMEN), which states that no phenomenon is named after its discoverer. The principles of Grimm's law were first described by Friedrich von Schlegel in 1806 and the Danish philologist Rasmus Kristian Rask in 1818; Jakob Grimm discussed them in detail in 1822 in his book *Deutsche Grammatik*.

Grimm's law is complicated, but it governs the ways in which particular sets of consonants change from one to another as languages develop. The relevant letter sets are the labials p, b, and f; the velars k, g, and h; and the dentals t, d, and th. This explains the Latin-English and Greek-English correspondences of pes-foot, labia-lip, and fundamentum-bottom (labials); cardia-heart, genu-knee, and hostis-guest (velars); and tres-three, duo-two, and thyroid-door (dentals). It also explains the association between rapid and rabid.

The Indo-European root LABH gave the Greeks lambanein (future lēpsomai), “to seize,” from which we get analeptic, cataleptic, epileptic, narcoleptic, and nympholeptic. And a syllable is letters taken together.

LABH, by another consonantal shift, became RABH, which gave the Greek word ereptomai, “to feed,” related to ereptein (Latin eripere), “to pluck.” Erepsin was the name that Otto Cohnheim used in 1901, presumably surreptitiously, to describe a group of polypeptidases found in the small intestine. The name came from ereptomai plus pepsin.

RABH also gave the Latin word rabere or, by Grimm's law, rapere, “to seize.” Whence the English words rabies, rabid, rape, raptor, rapture, and rapid. Rabies is the Latin word for fury or madness, because it seizes your mind. In France, by another consonantal shift, it is called la rage. The disease has also been called lyssa, the Greek word for madness, which Homer used to describe battle rage, but which later authors used to refer to other forms, such as Bacchic frenzy, the frenzy of the Furies, and even passionate love, before applying it to rabies in dogs.

Ravenous, ravish, and reverie (which originally meant delirium) also come from RABH, via yet another consonantal shift, this time Verner's law, after the Danish philologist who described it (preceded by Grassman). Henry Fielding well understood how rapid ravishment could be. “Fireblood,” he wrote in *Jonathan Wild* (1743), “who was no backward Youth, began to take [Loetitia] by the Hand, and proceeded so warmly, that, to imitate his Actions with the Rapidity of our Narration, he in a few Minutes ravished this fair Creature, or at least would have ravished her, if she had not, by a timely Compliance, prevented him.”

So, the next time you are moved to write a rapid response, make sure that it's not so rapid that it becomes a rabid response instead and gets turned down by the editors.

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