Childbirth Cultures, Concerns and Consequences and BIRTH

Lessons from two EU COST networks

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On behalf of members of COST Action IS0907/iR4B and IS1405
COST IS1405 Training School
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What is the problem?

Cesarean section rates in Europe

(Euro Peristat 2010)
Episiotomy rates in Europe
Stillbirth, maternal mortality, rising rates of low birth weight and prematurity

Heazell et al 2016

The Lancet

Ending preventable stillbirths

An Executive Summary for The Lancet's Series

"At the core of public health programmes for women’s and children’s health... high-quality antenatal and intrapartum care protects the mother and her baby, and represents a quadruple return on investments, saving the lives of mothers and newborns, preventing stillbirths, and additionally, improving child development."
Why the way birth is done should matter to politicians and governments...

(Conrad 2010)

Table 3
Estimated direct cost for select medicalized conditions in 2005.

<table>
<thead>
<tr>
<th>Medical condition (citation)</th>
<th>Estimated direct medical cost 2005 (in millions)</th>
<th>Year of original data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety Disorders (AHRQ, 2008)</td>
<td>10,878.3</td>
<td>2005</td>
</tr>
<tr>
<td>Behavioral Disorders (AHRQ, 2008)</td>
<td>4657.5</td>
<td>2005</td>
</tr>
<tr>
<td>Body Image (Cosmetic procedures and surgery) (American Society for Aesthetic Plastic Surgery, 2008)</td>
<td>12,376.0</td>
<td>2005</td>
</tr>
<tr>
<td>Erectile Dysfunction (Berenson, 2007; Eli Lilly and Company, 2006; Glaxo Smith Kline, 2005; Pfizer, 2005)</td>
<td>1112.1</td>
<td>2005; 2006</td>
</tr>
<tr>
<td>Infertility (AHRQ, 2008; Machlin &amp; Rohde, 2007)</td>
<td>1104.2</td>
<td>2005; 2000</td>
</tr>
<tr>
<td>Male Pattern Baldness (Anonymous, 1998)</td>
<td>1055.1</td>
<td>1999</td>
</tr>
<tr>
<td>Mammoplasty (Ngok, 2002)</td>
<td>214.3</td>
<td>2000</td>
</tr>
<tr>
<td>Normal Pregnancy and/or Delivery (AHRQ, 2008)</td>
<td>18,290.5</td>
<td>2005</td>
</tr>
<tr>
<td>Normal Sadness (Greenberg et al., 2003)</td>
<td>820.4</td>
<td>2003; 1998</td>
</tr>
<tr>
<td>Obesity (Bariatric surgery and weight loss medication) (American Society for Aesthetic Plastic Surgery, 2008; Encinosa et al., 2005)</td>
<td>1341.1</td>
<td>2005; 2002</td>
</tr>
<tr>
<td>Sleep Disorders (Walsh &amp; Engelhardt, 1999)</td>
<td>1,768.45</td>
<td>1995</td>
</tr>
<tr>
<td>Substance Related Disorders (AHRQ, 2008)</td>
<td>1468.7</td>
<td>2005</td>
</tr>
<tr>
<td>Total</td>
<td>77,086.3</td>
<td>2005</td>
</tr>
</tbody>
</table>

Table 3 provides the final estimation cost for all medicalized conditions in 2005 dollars, disaggregated by condition. All data originally collected in a year other than 2005 have been adjusted for inflation the 2005 Consumer Price Index, issued by the Bureau of Labor Statistics (Bureau of Labor Statistics, 2008).
New Lancet Maternal Health series (Sept 2016)

Too little, too late; too much, too soon

Miller et al 2016

"Every woman, every newborn, everywhere has the right to good quality care."

Too little, too late
- Lack of evidence-based guidelines
- Lack of equipment, supplies, and medicines
- Inadequate numbers of skilled providers
- Women delivering alone
- Lack of emergency medical services and delayed interfacility referrals

Too much, too soon
- Unnecessary caesarean section
- Routine induced or augmented labour
- Routine continuous electronic fetal monitoring
- Routine episiotomy
- Routine antibiotics postpartum
Impact of childbirth interventions: Beyond the Barker hypothesis...
A warning from our past:
still in our ? epigenetic present
(and future?)...
(REF)

• Diethylstilbestrol (DES): oestrogen mimic, 1940s-1970s to prevent miscarriage.

• Index mothers: higher rates of breast cancer

• Daughters: *a variety of birth-related adverse outcomes in... daughters* [of exposed women] *such as spontaneous abortion, second trimester pregnancy loss, preterm delivery, stillbirth, and neonatal death. sub/infertility and cancer of reproductive tissues* (Reed and Fenton, 2013 p134).

• Sons: testicular cancer

• Emerging evidence of potential adverse effects on the grandchildren of the index women
Labour and birth are too short to programme long term outcome (?)...

So reducing mortality is paramount...
...birth interventions and non-communicable disease...

Feedback loops between the hormonal and physical effects of birth and:

- Type 1 diabetes in the neonate
- Eczema
- Asthma
- Multiple sclerosis
- Bronchiolitis
- Obesity
- Some cancers
- Etc....
- ...changes in white blood cell DNA-methylation in cord blood (Schlinzig et al 2009)
The EPIIC hypothesis: Intrapartum effects on the neonatal epigenome and consequent health outcomes


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Recent data supporting the EPIIC hypothesis...

Almgren et al 2014

- 27 elective CS infants and 37 vaginally born infants with spontaneous labour onset all born at term and healthy
- CD34+ cells in cord blood sampled
- CD34+ cells from CS infants globally more DNA methylated than from SVD infants
- In 343 difference > 10%; majority hypermethylated for SVD infants
...linking up the observational data
(Almgren et al 2014)

Top 4/20 regulation impacts:

• Immunoglobulin biosynthetic processes
• Glycolysis
• Ketone metabolic processes
• Response to food

• ‘differential methylation’ of HLA-F, a ‘major histocompatibility complex class I gene’
• associated with genetic predisposition to (or protection from?) type 1 diabetes
The importance of labour: 
*Physiological labour processes MATTER?* 
(Almgren et al 2014)

- Degree of methylation in 3 sites corresponded to length of labour
- The pattern for CS infants was similar to those with shorter spontaneous labours and spontaneous vaginal births
More than ‘not caesearan’
The importance of spontaneous labour?
Foals up to 10 days postnatal following induced labour

(Holdstock et al 2012)

- Differences in pancreatic endocrine cell function with delivery method were associated with 2-3 fold higher cortisol levels in the induced foals and with differences in the absolute and age-related changes in basal concentrations of glucose, alpha-amino nitrogen and insulin.

- Induced delivery leads to changes in pancreatic beta cell sensitivity to glucose and/or tissue insulin resistance in association with persistent neonatal hypercortisolaemia.
The microbiome/extended hygiene hypothesis

• At birth and for the first weeks to months of life the baby is seeded with microbes from the mother and from the environment.

• Microbes reside in the gut, mucosal tissues and skin

• The balance appears to be crucial on regulating immune responses and avoiding inflammation-driven diseases
Microbiome hypothesis

• Crosstalk between the gut microbiota and the brain, initiated during the intrauterine period, is perpetuated throughout life (Braniste et al. 2014; Dinan and Cryan 2016)

• Infants born by elective caesarean section have very low bacterial richness and diversity for at least four months following birth (eg Canadian CHILD Study 2013; Rutayisire et al 2016)
Physiological labour and birth is good for most of us…?

Soloman 1985

…the immune system, operating via the central nervous and neuroendocrine systems, may act as a transducer between experience and disease (or wellbeing??)
The biggest ever uncontrolled experiment in human health …?

• ….Generally, between 70 and 80% of all pregnant women may be considered as low-risk at the start of labour.

• ….The uncritical adoption of a range of unhelpful, untimely, inappropriate and/or unnecessary interventions, all too frequently poorly evaluated, is a risk run by many who try to improve the maternity services.....

WHO
http://www.who.int/reproductivehealth/publications/MSM_96_24/MSM_96_24_Chapter1.en.html
“We cannot solve our problems with the same thinking that created them”

-Albert Einstein
A new way of seeing

- Salutogenesis
- Complexity
- Uncertainty
A salutogenic orientation facilities seeing things that experts in a given pathology might well fail to see...it...pressures one to think in systems terms..we are all familiar with the concept of a risk factor. Can we not think of the concept of a salutary factor? (Antonovsky 1993)
Salutogenic fundamentals

Manageability

having the resources
(self and extended)
to meet demands
Salutogenic fundamentals

Comprehensibility

Being able to make sense of (difficult/traumatic) situations
Salutogenic fundamentals

*Meaningfulness*

the ability to view experience in the context of life as a whole
Salutogenic fundamentals

Sense of coherence

• ‘..a global orientation...’

• ? An outcome?

Antonovsky A 1987
Complexity theory:
‘from being to becoming…’

• The physics of being: (classical and quantum mechanics)...

• The physics of ‘becoming’: ..thermodynamics in its modern form...self-organisation and the role of fluctuations...

P. Prigogine 1980 From being to becoming: time and complexity in the physical sciences. WH Freeman
Metaphors/concepts of complexity

• The importance is in the whole and not the parts: (Brownian motion)

• ‘Self-organising dynamical systems’ (sensitivity to initial conditions)

• Non-linearity

• Emergence (‘Small in, large out’)

• Connectivity
Normal pregnancy, birth, and long-term consequences as complex adaptive processes

• Dynamic...
• Connected....
• Emergent.....
• Unpredictable....
• ?self-organising...?
Intriguing (complex, adaptive, salutogenic) solutions?

‘Just getting women talking’

Prost et al 2013

-Seven trials (119,428 births).
-37% less maternal mortality (OR 0.63, 95% CI 0.32-0.94),
-23% less neonatal mortality (0.77, 0.65-0.90)
-9% less stillbirths (0.91, 0.79-1.03),

-(when at least 30% of local women took part) the intervention could save an estimated 283,000 newborn infants and 41,100 mothers per year in rural areas of 74 Countdown countries.
Intriguing solutions?
Midwife led continuity of care: selected outcomes
Sandall et al 2015

15 trials, 17,674 women

Less
• preterm birth less than 37 weeks (average RR 0.76, 95% CI 0.64 to 0.91)
• all fetal loss before and after 24 weeks plus neonatal death (average RR 0.84, 95% CI 0.71 to 0.99)

More
• spontaneous vaginal birth (average RR 1.05, 95% CI 1.03 to 1.07)
Current childbirth discourses: examples

**Medicalisation**
- biomedical/imaging
- culturally dominant?
- reducing pathology?
- increasing iatrogenesis?
- feminist critique - BUT
  - critique not problematised

**‘Technocracy’**
- Economic
- Consumerist
- Modernist
- Operational surveillance
  - Linear, mechanistic
  - Standardised

**‘Humanisation’**
- Psycho-social
- Woman-centred
- Post-modernist
  - Reduces iatrogenesis?
  - Complexity based
  - Not problematised
Turning this into two COST Actions…
Geographic representation
Building Intrapartum Research through Health (COST BIRTH Action)

Over 100 scientists from 33 countries:

- architecture, sociology, epidemiology, statistics, anthropology, psychology, obstetrics, midwifery, nursing, physiology, biology, service users, social activists, engineering...
EU Birth Research Project
A COST Action website detailing research into birth practices

Information about the EU Birth Research Project

(scroll down for list of working groups map of members’ locations)

Information about the EU Birth Research Project

About
News
WG1: Biomedicine
WG2: Biomechanics
WG3: Socio-cultural perspectives
WG4: Organizational perspectives
WG5: Neuro-psycho-social perspectives
Welcome to the EU Birth Research website. You will find all the information you need about the EU Birth Research project, which is a COST Action project.

There are six Working Groups in the project. You can view information on all of these, plus details on the Short Term Scientific Mission (STSM) and Early Career Investigators (ECI) groups, by clicking on the relevant links (below or via the Menu tab).

You can also view the role and members of the Core Group and the Management Committee on the COST website here.
Objective of Action IS1405 BIRTH

To improve maternal and infant wellbeing and the economic sustainability of European maternity services, by advancing scientific knowledge of the normal physiology of labour and birth through a range of disciplinary perspectives.
What the funding supports

• Management Committee Meetings
• Working Group Meetings
• Training Schools
• Workshops
• Short Term Scientific Missions
• Conferences
Babies Born Better (B3) survey
Salutogenic, complex systems based, designed to learn from the best

- Based on new social media (e-survey, through facebook, twitter, e-forums)
- Currently in 13 languages: 12 more in preparation
- Nearly 40,000 responses from 20 countries
Innovative knowledge transfer

http://www.iresearch4birth.eu/iResearch4Birth/
https://www.facebook.com/iResearch4Birth

• Podcasts
• Crowdsourcing
• Twitter
• Stakeholder CoPs
• Activism
• Policy change
Human beings are complex systems, that co-evolve over time and through generations.

But we can only know how this works if we collect the right data, and ask the right questions, in relation to the outcomes that matter to those affected - in the short and long term, and across generations.

Antonovsky A 1993 In Turnbull et al (Eds) *Cognitive coping families and disability* Chapter 8: The implications of salutogenesis: an outsiders view XX

**Barker hypothesis**


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