Europe’s declining population and the contribution of ART

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ART and demography?

• Assisted Reproduction Technology (ART)
  
  – Traditionally viewed as a treatment option for infertile couples.
    • Rather expensive
    • Advanced medicine, nearly experimental
  
  – To the extent it is the responsibility of the welfare state to cover the cost of ART, it is because of the psychological burden being infertile and childless

• The demographic issue will change this…
The EU-parliament

- Traditionally hostile towards ART
  - ART is immoral
  - Infertility a private matter
  - ART is not part of public health service

- Traditionally the domain of the Christians and the Greens

- Efforts from the profession (ESHRE) to open up a dialog has been met with stiff opposition form the Vatican.
EUROPEAN PARLIAMENT

• “General considerations point 26:

• Calls upon the Commission to take into consideration the sensitive issue of infertility, which affects both married and unmarried women and couples;

• calls for infertility to be made the subject of a specific recommendation in order to ensure that all the Member States acknowledge it and that the cost of treating infertility medically and psychologically is covered by social-security schemes..”
General considerations point 27:

Notes that infertility is:
- a medical condition recognised by WHO that can have severe effects such as depression;

points out that infertility is on the increase and now occurs in about 15% of couples;

therefore calls on the Member States to ensure the right of couples to guarantee universal access to infertility treatment and medically assisted procreation by taking steps with a view to reducing the financial and other obstacles;.."
The reason for the EU parliament's 180°

- EUROPEAN PARLIAMENT

- Report on the demographic future of Europe (2007/2156(INI))
  - 30.01.2008
    (http://www.europarl.europa.eu)
A new perspective on ART?

• The demographic issue as a game changer
Demography

• Europe has decided to slowly commit a collective suicide

—A bit tabloid, yes, but...
Across Europe, fertility has fallen below replacement level

Replacement TFR: 2.1

Low low TFR: 1.5
Different rates and different consequences

- Number of children per woman
  - 0
  - 1.5
  - 2.1

- Replacement level
- Sub-replacement level
- Low fertility level

• Cause for Attention
• Cause for Concern
Total Fertility rate

- Historically no population seem to have been able to recover after the TFR have dropped under 1.5 (Rand)
  - Many regions in Europe is already there
  - The rest is following suit

- I have sensed a state of growing panic amongst demographers and some bureaucrats and politicians in the EU and European council level
  - Reminds me of the North sea cod issue😊
Mean age at birth of first child

Year

Mean age
The ageing mother

• Not only demographic consequences
The ageing mother

Fig 1 Risk of fetal loss from spontaneous abortion, ectopic pregnancy, and stillbirth according to maternal age at conception.
The ageing mother

**Figure.** Fertility and Miscarriage Rates as a Function of Maternal Age.
Adapted from Menken et al.\(^1\) and Anderson et al.\(^2\)
Changes

• ”An epidemic of Down’s syndrome”

• An increase in the need for fertility services
  – much of it for “non-medical” reasons
Demographics

• To the demographics again
Double whammy

- Age of first child goes up
  - Generation time increases

- Each woman gives birth to fewer children
  - Below replacement level of 2.1

- "The production" is far too low

- This is in biological terms a non viable society model
  - We will vanish.. Soon be history
The irony

- It is ironic that when Europe finally largely achieved peace and prosperity, we stopped reproducing.
Population decline

- Italy
- Spain
- Germany
- UK
- France

Comparison between 2000 and 2050.
Population of Europe as % of world population

- 1910
- 2050
Current depopulation
Migration and low birth rate

Map 4: Depopulation in Europe

Depopulation between around 1980 and 2002/04

- very strong
- strong
- less strong
- weak

NUTS-3-Regions
Sources: N.S.A, Eurostat
Cartography: R. Mali 2005
The age pyramid will not become a pyramid

The proportion of elderly will double by 2050

EU-15 in 1965

EU-15 in 2000

EU-15 in 2050 (projected)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>EU-15 in 1965</th>
<th>EU-15 in 2000</th>
<th>EU-15 in 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 15</td>
<td>24.7%</td>
<td>16.8%</td>
<td>13.5%</td>
</tr>
<tr>
<td>Between 15 and 64</td>
<td>63.1%</td>
<td>66.8%</td>
<td>56.5%</td>
</tr>
<tr>
<td>65 and over</td>
<td>12.2%</td>
<td>16.4%</td>
<td>30.0%</td>
</tr>
<tr>
<td>85 and over</td>
<td>0.5%</td>
<td>1.9%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Life expectancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(M)</td>
<td>68.4</td>
<td>75.4</td>
<td>82.3</td>
</tr>
<tr>
<td>(F)</td>
<td>74.7</td>
<td>81.4</td>
<td>87.4</td>
</tr>
</tbody>
</table>
The declining population

- Maybe the biggest problems is:
  - Old age dependency ratio
  - Ratio of pensioners to contributors
Ratio of pensioners to contributors is increasing

Old Age Dependency Ratio

Number of Old Age People (over 65 years) per 100 Economically Active Population (between 15 and 64 years)

- European Union (15 countries)
- Denmark
- France
- Germany (inc. ex-GDR from 1991)
- Italy
- Netherlands
- Spain
- Sweden
- United Kingdom
- Other EU-25 countries

Years: 1970 to 2030
The welfare society as we know it will collapse

These new demographics may threaten living standards ...

- Falling productivity and increasing dependency will reduce potential GDP growth from 2.1% to 1.3% a year
- Age-related spending as a proportion of GDP will increase:
  - Pensions: 7.4% (2000) to 10.8% (2050)
  - Healthcare: 6.0% (2000) to 9.3% (2050)
- As a consequence of ageing, share of EU in global output is expected to decrease:
  - EU from 18% (2000) to 10% (2050)
  - US from 23% (2000) to 26% (2050)
Italy and Spain

- 1985:
  - 1 pensioner was supported by 4 tax payers

- 2050:
  - 1 tax payer must support 2 pensioners
Demography

• Most European countries will have to address the population issue to avoid a collapse of the social structures as we know it.

• Possibilities:
  – Increase the fertility of the fertile population
    • Economy and service
      – Earlier childbirth and more than 1-2 children
  – Increase the service to the infertile population
    • “Those who wants to reproduce should be helped”
  – A substantial higher rate of immigration
  – Retirement much later in life (70’ties)
  – A substantial increase of direct and indirect taxes
Retirement age needed to maintain 1995 old-age dependency ratio
Immigration

• Increased immigration will be part of the solution
  – Need skilled and willing hands
  – Need families not “guest workers”
  – Need immigration on a massive scale and it must be organised
  – UN: “replacement migration”
Is it morally right to "steal" the best Poles?
Europe told to open borders for 20m Asian and African workers

Justice chief says all skill levels are required

By Andrew Bounds in Brussels

Europe must relax its immigration controls and open the door to 20m workers during the next two decades, the European Union's justice chief will say today.

"Europe has to compete against Australia, Canada, the USA and the rising powers in Asia," he will suggest the word "immigration" and its "dark side" should be dropped in favour of "mobility".

Two-year residency that could be extended. After five consecutive years living in any number of EU countries, a two-year limit would lapse, he will say.

"We have to look at immigration not as a threat but as an enriching phenomenon of today's world," he will say.

Franco Frattini, justice commissioner, is to tell the immigration ministers in Brussels the EU should stop putting barriers and instead build pathways for Africans and Asians who risk their lives trying to get to the continent to find work.

"Europe must relax its immigration controls and open the door to an extra 20m workers during the next two decades, the European Union’s justice chief will say today."

Franco Frattini, justice commissioner, is to propose an EU “blue card” to compete with the US green card. Skilled workers could apply for so he will also stress the importance of finding jobs for indigenous workers and cracking down on illegal immigration.
Back to my profession

• Assisted reproduction technologies – ART
  – IVF/ICSI
  – Semen/oocyte donation
  – Insemination
  – Etc..

• Do we as a profession count in the demographic context?
Demographics - What now?

• We have two important contributions

• As Pronatalists
  – Increase fertility rate

• As servants to the Harvard business school
  – ?
Provision of ART

• ART as part of a population policy mix?

• Let’s look at the Europeans performance now
Number of ART cycles per capita 2002
Percentage of infants born after ART, 2004
Europe and United States

Cycles/mill

ESHRE, EIM 2007
MMWR, Surveillance Summaries, 2007
Number of ART cycles per million inhabitants in the Nordic countries 1997 – 2005

Nyboe Andersen – NFS 2008
Provision of ART

- ART activity in a country vs. Various economic and developmental indexes
Number of ART cycles per million inhabitants versus the Gross Domestic Product in some European countries.
Cost of ART as % of GDP
Guessed guesstimate ☺

Good guys

Can do better

Why?

Shame on you

>0,03%

0,02-0,03%

0,015-0,020%

0,01-0,015%

< 0,01%

ND
Provision of ART

• Why the differences?

• The million Euro question
Provision of ART

• Why the differences?
  – Economy and development
    • The role of public institutions and public spending
    • …. and all of this..
  – The status of the infertile patient
    • A worthy patient?
  – Religion

• These are not independent variables
Financial support of public ART-units
Nordic countries per capita per year

* Estimate based on number of ART cycles and reimbursement of the Clinics
Public spending on ART

• Really not an economic issue (?)
Children is a good investment even in tangible terms

- The City approach to evaluating the profitability of children.

- Net Present Value
  - The return of an investment..
  - Might happen in the future, calculated as the net gain in today's “money”
  - Method frequently used by investment analyst

- Naturally conceived:
  - Life time NPV (net present value):
    - 244 000 Euro
    - Break even point 29 years old

- ART children:
  - Life time NPV (net present value):
    - 225 000 Euro
    - Break even point 31 years old

Ledger et al
ESHRE Prague 2006
ART and Demography

• Can ART be used as a demographic tool, part of a pronatalist policy?
UK as Denmark?

Two cases: United Kingdom and Denmark

<table>
<thead>
<tr>
<th></th>
<th>UK</th>
<th>Denmark</th>
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</thead>
<tbody>
<tr>
<td>Population</td>
<td>59.3 million</td>
<td>5.4 million</td>
</tr>
<tr>
<td>TFR:</td>
<td>1.64</td>
<td>1.72</td>
</tr>
<tr>
<td>ART cycles</td>
<td>37,083</td>
<td>11,081</td>
</tr>
<tr>
<td>ART births:</td>
<td>1.4% of total births</td>
<td>4.2% of total births</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>76.1 yr (M)/ 81.1 yr (F)</td>
<td>75.5 yr (M)/ 80.2 yr (F)</td>
</tr>
<tr>
<td>Age of 1st birth</td>
<td>29.1 years (F)</td>
<td>27.5 years (F)</td>
</tr>
<tr>
<td>Current policy</td>
<td>Regional variations in reimbursement policies</td>
<td>3 cycles reimbursed in public clinics</td>
</tr>
</tbody>
</table>
Not so much, but...

The projected impact of ART impact on age-structure

Projected age structure of United Kingdom in 2050

- Men
- Women
- Men - ART births
- Women - ART births
RAND report on ART

• Cost per extra child with different population policies..
  – That’s how they in general provide data for evidence based policy making

  – Invest in Assisted Reproduction
    • 20 000 – 40 000 Euro per child

  – 25% increase in child benefits
    • 70 000 – 150 000 Euro per child
A new role for ART in the future?

- In nations where ART is not a moral issue:
  - It is highly likely that increased spending on ART will be a part of these nations' population policy mix.

- In the nations where ART is a moral issue:
  - ART as a demographic tool will be ridiculed and marginalised.
    - The Pope and the Calvinist cannot afford to lose the issue.
  - Pronatalists have won the first round 😊.
What now?

• We have to important contributions

• As Pronatalists—producing babies
  – A call for new citizens from the population ministry

• As servants to the Harvard business school ??
Opportunists or demographers?

- Question to female students of Harvard business school

  - Q:
    - “If the ART community could fix it... At what age do you prefer to have your child..?”

  - A:
    - “at 55 would be fine”
Egg freezing now available to all women

Sarah-Kate Templeton Health Editor

WOMEN are to be offered for the first time a dedicated egg freezing service that will enable them to have a healthy baby when they choose.

Two of Britain's leading fertility clinics will this month launch new egg freezing programmes designed for women who wish to postpone motherhood to pursue a career or find the right partner. It could transform women's lives in a similar way to the contraceptive pill by enabling them to beat their biological clocks and pick the moment in their lives when it best suits them to start a family.

The programmes have been made possible by a breakthrough in freezing technology that almost eliminates the risk of damage to eggs. Until now, egg freezing has largely been restricted by doctors to cancer patients left infertile by chemotherapy.

Clinics believed the success rates of the technology were so low that it was unethical to advise healthy women to use egg freezing for social reasons. Doctors feared the women would sacrifice their chance of conceiving naturally and later discover their frozen eggs were too damaged to use.

Now, however, new techniques with far higher success rates have been developed, and the two clinics believe they make it ethically justified to offer a service aimed at career women. The clinics say the eggs frozen through techniques known as vitrification emerge from years in storage in almost the same condition as when they were released from the ovaries. Egg freezing costs between £2,500 and £3,000 per cycle.

Dr Simon Fishel, managing director of Care Fertility, which has 10 fertility clinics across Britain and will be marketing a new type of egg freezing to all women, said: "Until now, the conventional technology has been used to freeze eggs mainly only as a last resort for women who are preserving fertility before cancer treatment.

"With this new technology, which is almost as efficient as using fresh eggs, it might make a lot of sense for women in their..."
A society we want?

- Reproducing at 55
  - Population collapse
  - Two few far too late
- Not sustainable – will just be a temporary flirt
- Oocyte donation will boom
  - What’s the moral analysis of a strategy where rich women become pregnant in their middle ages with other women’s oocytes?
- Already a strong reaction towards the growing industrialization of oocyte donation in Europe
Statements
The conservative rhetoric

• Women should stay at home to give birth and take care of the children
  – “It was so much better before”
• The Vatican’s solution
The conservative rhetoric II

• If we forbid abortion, we will have a lot of extra births…..
Surprising(?) statement from some professionals

• “The World’s population must decline anyway, why make the fuss?”

• “Europeans are consuming too much of the world’s recourses ..it’s fine that they disappear, the world is overpopulated anyway”

• My question:
  – If Europe collapses economically, will that benefit the world..or the developing world.. Or.. ?

• Concern:
  – We have not been given the option to take part in this discussion that apparently take place behind closed doors
Society Darwinism

• Leif Häggelund, Malmö
  
  – ”…men de e jo bara så här..”

• This might well be right:
  
  – Mean lifespan of a civilization is 400 years.
  – We might just be at the end of our allotted time.. A culture in senescence
The political goal

- I have not met any politician or expert who believes that the birth rate in Europe will/can increase to replacement level again.

  - The aim seems to be a controlled population decline
    - Avoid a collapse
We’re is going to have an interesting period the next decades

How will the demographic issue influence the situation for ART in Europe?

..or vica versa..😊
• end