



***Mechanisms for socio-economic inequalities in health in children
in a life course perspective***

Pre and perinatal inequalities in health
Early life is key to improvements in health equity
‘All human beings are born free and equal ...’

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All for Equity

World Conference on Social Determinants of Health

RIO DE JANEIRO | BRAZIL | 19–21 OCTOBER 2011



Rio Political Declaration on Social Determinants of Health

Rio de Janeiro, Brazil, 21 October 2011

6. Health inequities arise from the societal conditions in which people are born, grow, live, work and age, referred to as social determinants of health. These include early years' experiences, education, economic status, employment and decent work, housing and environment, and effective systems of preventing and treating ill health. We are convinced that action on these determinants, both for vulnerable groups and the entire population, is essential to create inclusive, equitable, economically productive and healthy societies. Positioning human health and well-being as one of the key features of what constitutes a successful, inclusive and fair society in the 21st century is consistent with our commitment to human rights at national and international levels.

10

There are five key action areas critical to addressing health inequities: (i) to adopt better governance for health and development; (ii) promote participation in policy-making and implementation; (iii) to further reorient the health sector towards reducing health inequities; (iv) to strengthen global governance and collaboration; and (v) to monitor progress and increase accountability

11.2

- (xi) Give special attention to gender-related aspects as well as early child development in public policies and social and health services;



Old news

THE RELATIONSHIP OF FETAL AND INFANT MORTALITY TO RESIDENTIAL SEGREGATION

An Inquiry Into Social Epidemiology*

ALFRED YANKAUER, JR., M.D.†

Rochester Health Bureau and University of Rochester School of Medicine and Dentistry

SI^R ARTHUR NEWSHOLME in 1909 wrote: "Infant Mortality is the most sensitive index we possess of social welfare and of sanitary administration, especially under urban conditions."¹ This concise statement, quoted many times, has remained a keystone in public health thinking.

In the City of New York during the three years 1945-1947, 2,060 infants of resident non-white parentage died before completing the first year of their lives. If the same infant mortality rate had prevailed among them as among infants of white parentage, only 1,130 would have died. For these three years the annual average non-white infant mortality rate was 87% higher than the white rate.

These striking contrasts are not limited to the City of New York, and in a general

white or Negro segment of our population is relegated to an under-privileged status.⁴ In urban areas one of these mechanisms is residential segregation, the systematic effort to deny the Negro dwelling rights in any but a designated area of the city. It seemed appropriate therefore to examine the possible relationship of residential segregation and fetal and infant deaths among urban Negroes and whites.

MATERIAL AND METHOD

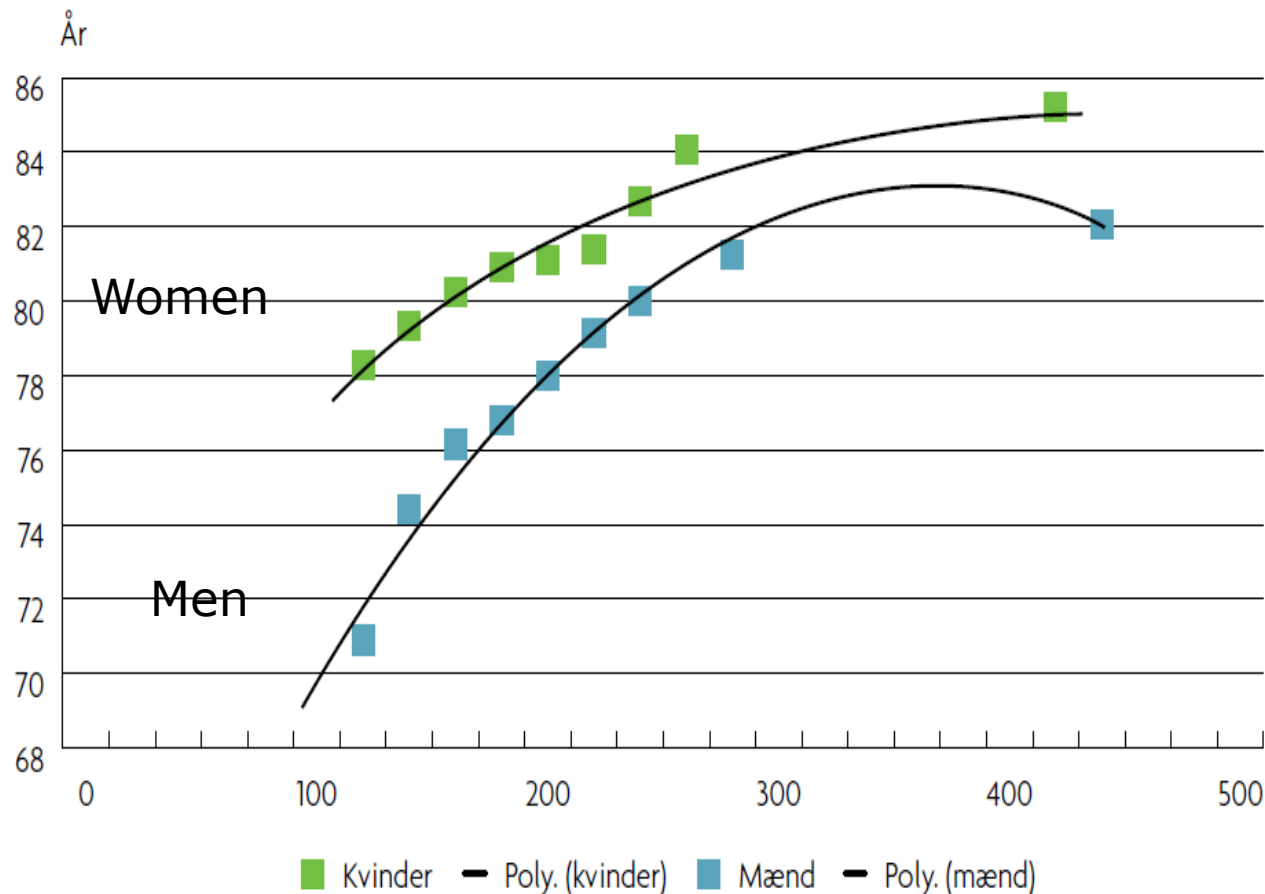
The largest group of urban Negroes in the United States lives in the City of New York. In 1940 the Negro population enumerated was 458,444 and estimates based on the Census Bureau sample of April 1947 indicate an increase of over 50% during the seven-year period since 1940.⁵

Does disadvantaged social position
lead to disadvantaged health?
Is it an automatic, almost
unavoidable, process?



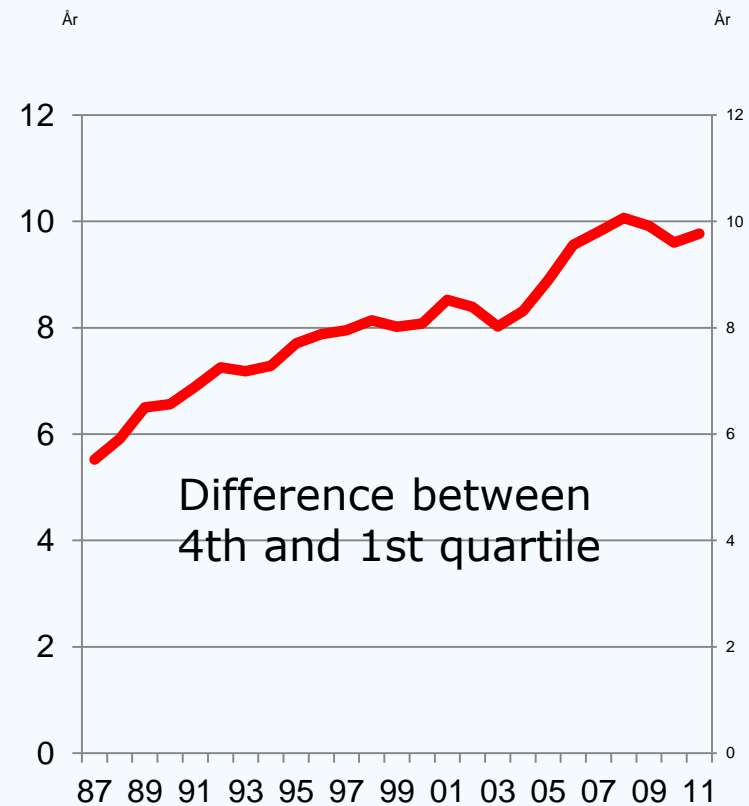
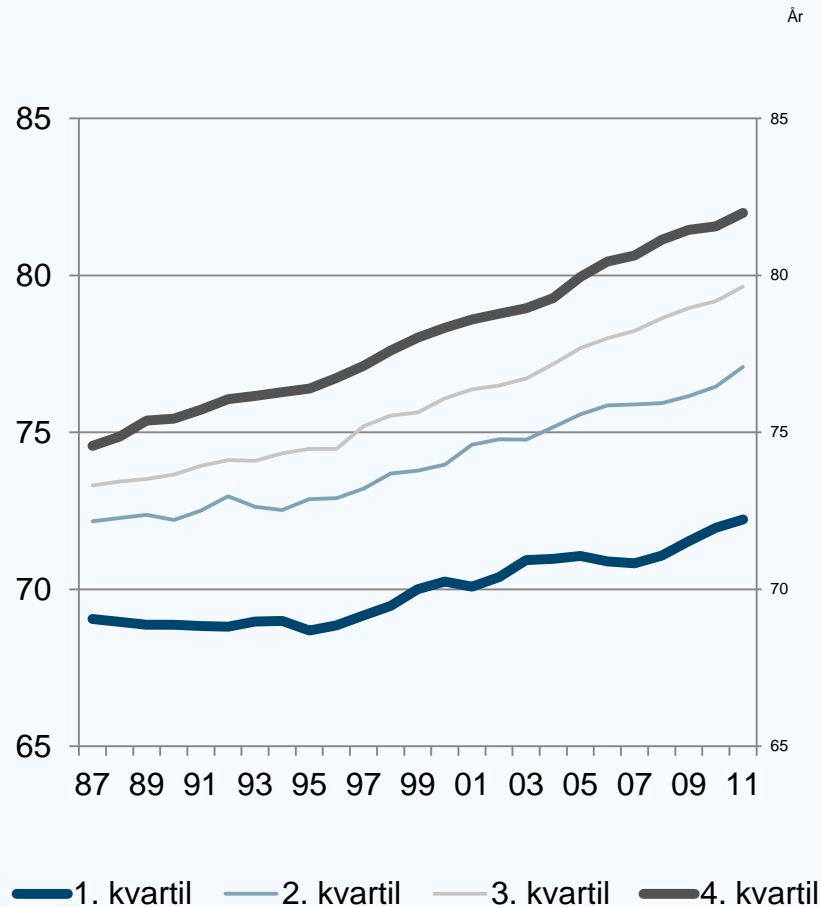
The situation in Denmark, 2008-09

A curve-linear relationship between income and life expectancy
(deciles marked)



A widening gap in life expectancy

Denmark, time trend from 1987 to 2011, income quartiles



Recent global and national analyses

Commission on Social Determinants of Health FINAL REPORT | EXECUTIVE SUMMARY



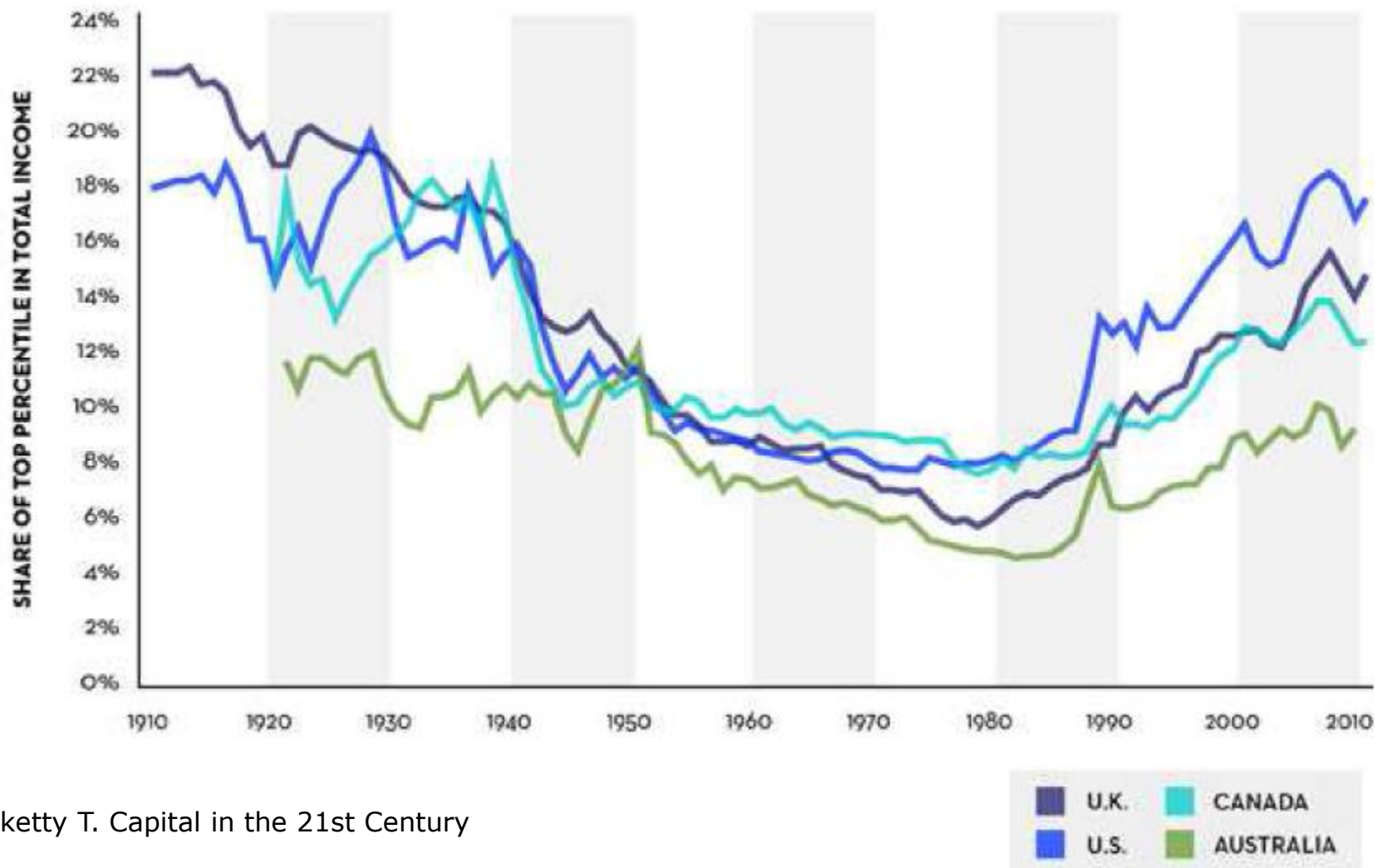
Closing the gap in a generation

Health equity through action on the social determinants of health

Commission of Social Determinants of Health, 2009



INCOME INEQUALITY IN ANGLO-SAXON COUNTRIES, 1910-2010



The (hypo)critical questions

Why do health inequalities increase in Denmark

- Where we have had health inequalities high on the political agenda for decades ?
- Where the welfare state is developed and (still) universal?
- Where income inequality is low (as measured by Gini-coefficient) and absolute poverty minor?



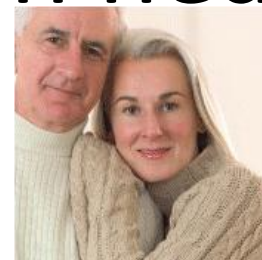
No answers, but hopefully food for thought

- We have not – in reality - taken a life-course perspective to health inequalities
- What are important health inequalities in early life?
- Do we actually know how to change these outcomes?



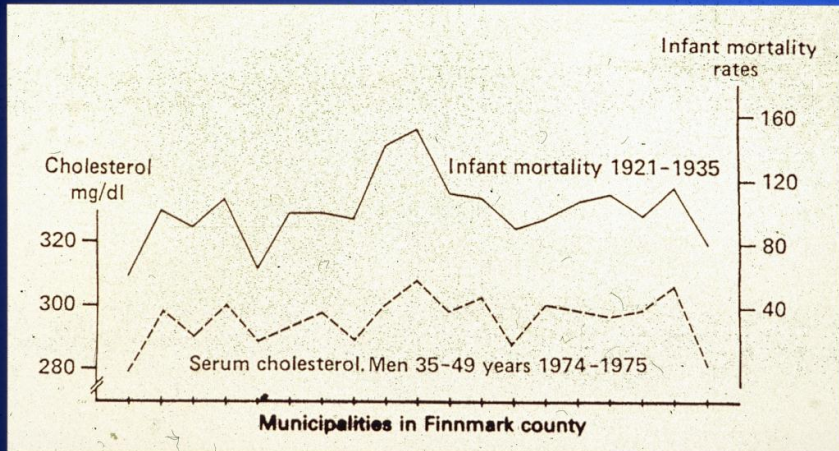


Life-course perspectives on health



Infant health and adult health

Serum cholesterol (mg/dl) for men aged 35-49 years in 1974-5 and the infant mortality at time of their birth 1921-35 by municipality in Finnmark county. Forsdahl (1978).



Barker DJ, Mothers, babies and
Disease in later life
BMJ Publishing Group 1994

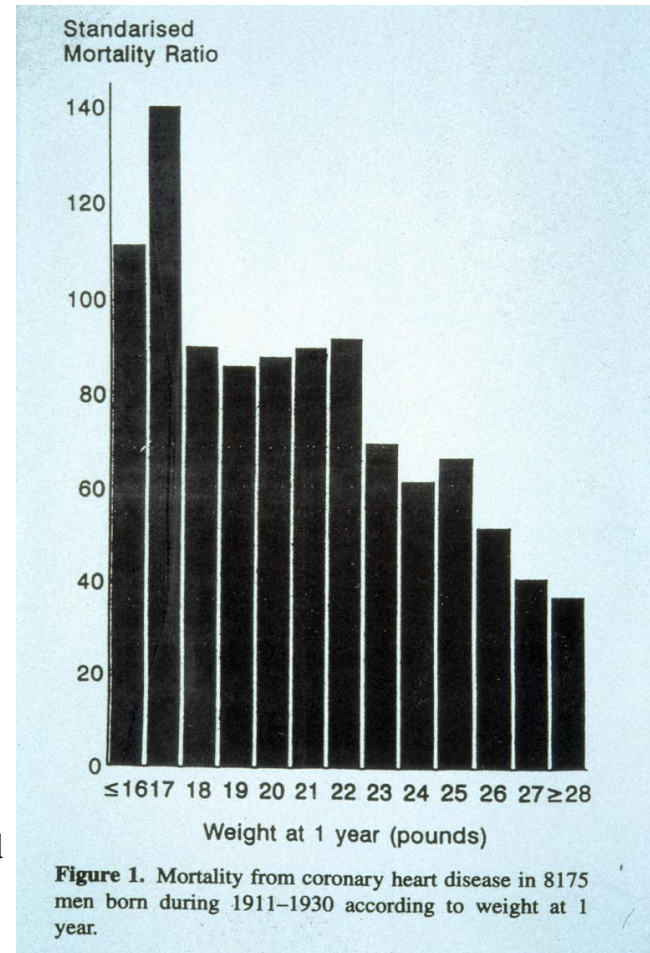
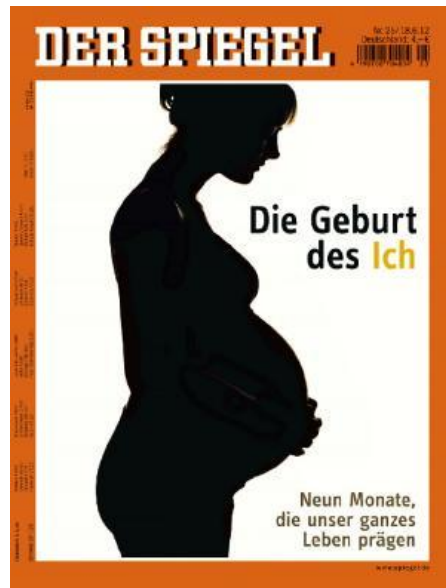
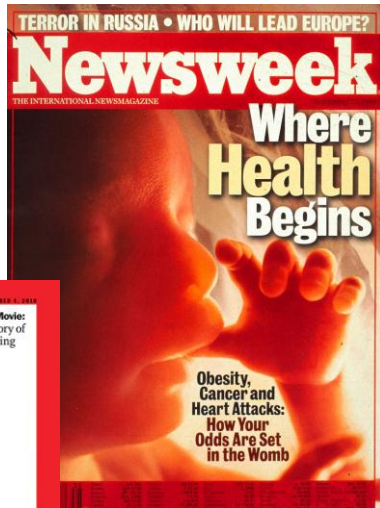


Figure 1. Mortality from coronary heart disease in 8175 men born during 1911-1930 according to weight at 1 year.



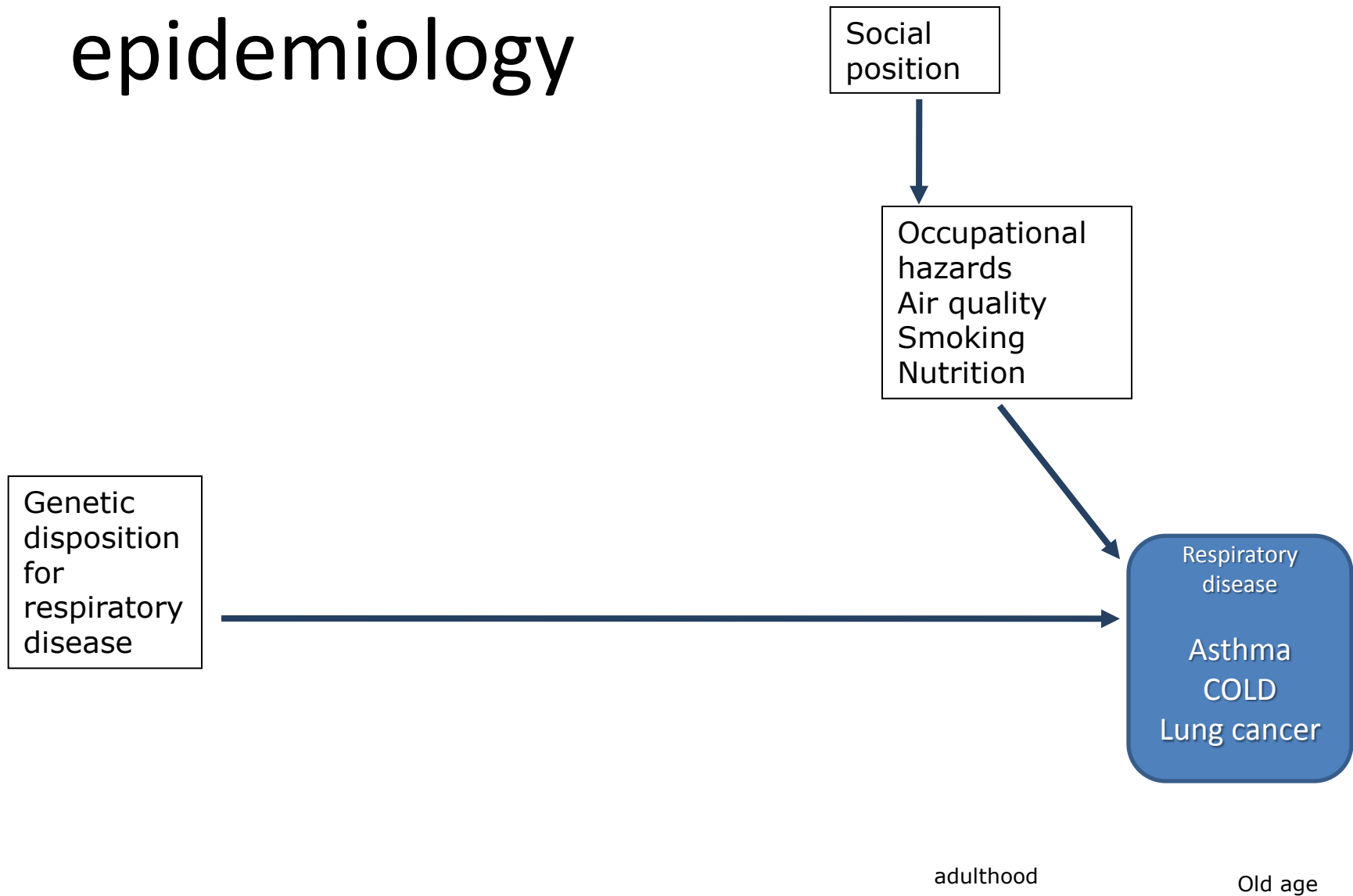
DOHaD Developmental Origin of Health and Disease



Strong associations between

- Birth weight
- Gestational age at birth
- Intrauterine nutrition
- Other early life circumstances and adult health

20th century epidemiology

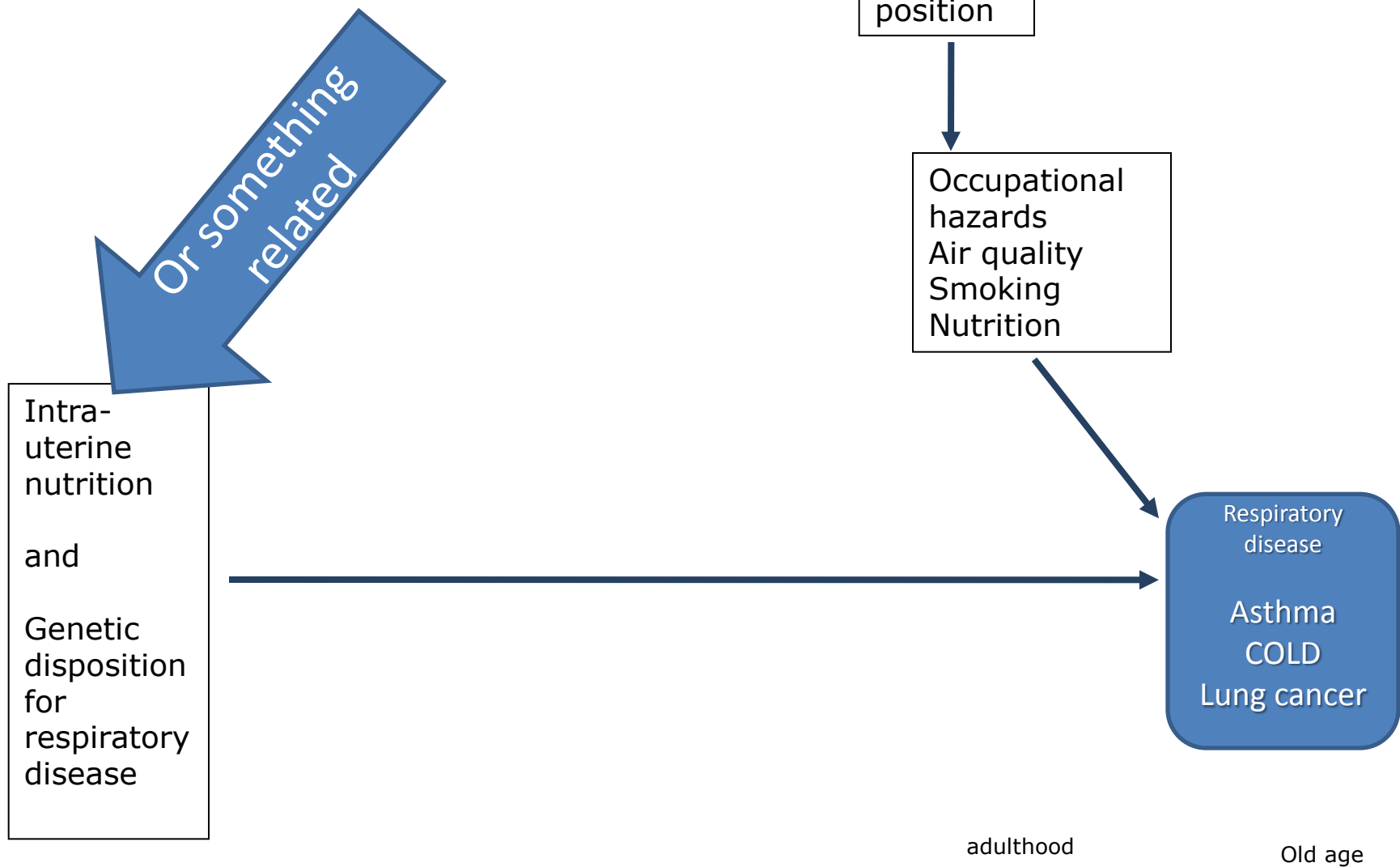


adulthood

Old age



Programming



adulthood

Old age



Birth characteristics predict adult health

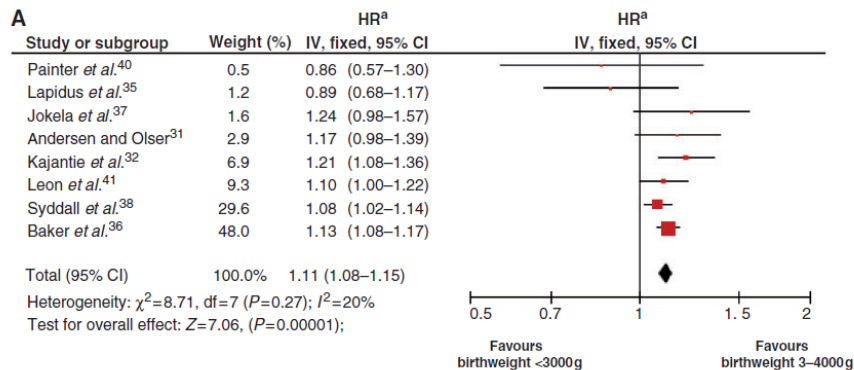
Birth weight and mortality

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International Journal of Epidemiology 2011;1:1-15
doi:10.1093/ije/dyq267

Birthweight and mortality in adulthood: a systematic review and meta-analysis

Kari R Risnes,^{1,2,3*} Lars J Vatten,¹ Jennifer L Baker,⁴ Karen Jameson,⁵ Ulla Sovio,⁶
Eero Kajantie,⁷ Merete Osler,⁸ Ruth Morley,⁹ Markus Jokela,¹⁰ Rebecca C Painter,¹¹ Valter Sundh,¹²
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Preterm birth and adult disability

ORIGINAL ARTICLE

Long-Term Medical and Social Consequences of Preterm Birth

CONCLUSIONS

In this cohort of people in Norway who were born between 1967 and 1983, the risks of medical and social disabilities in adulthood increased with decreasing gestational age at birth.

N Engl J Med 2008;359:262-73.

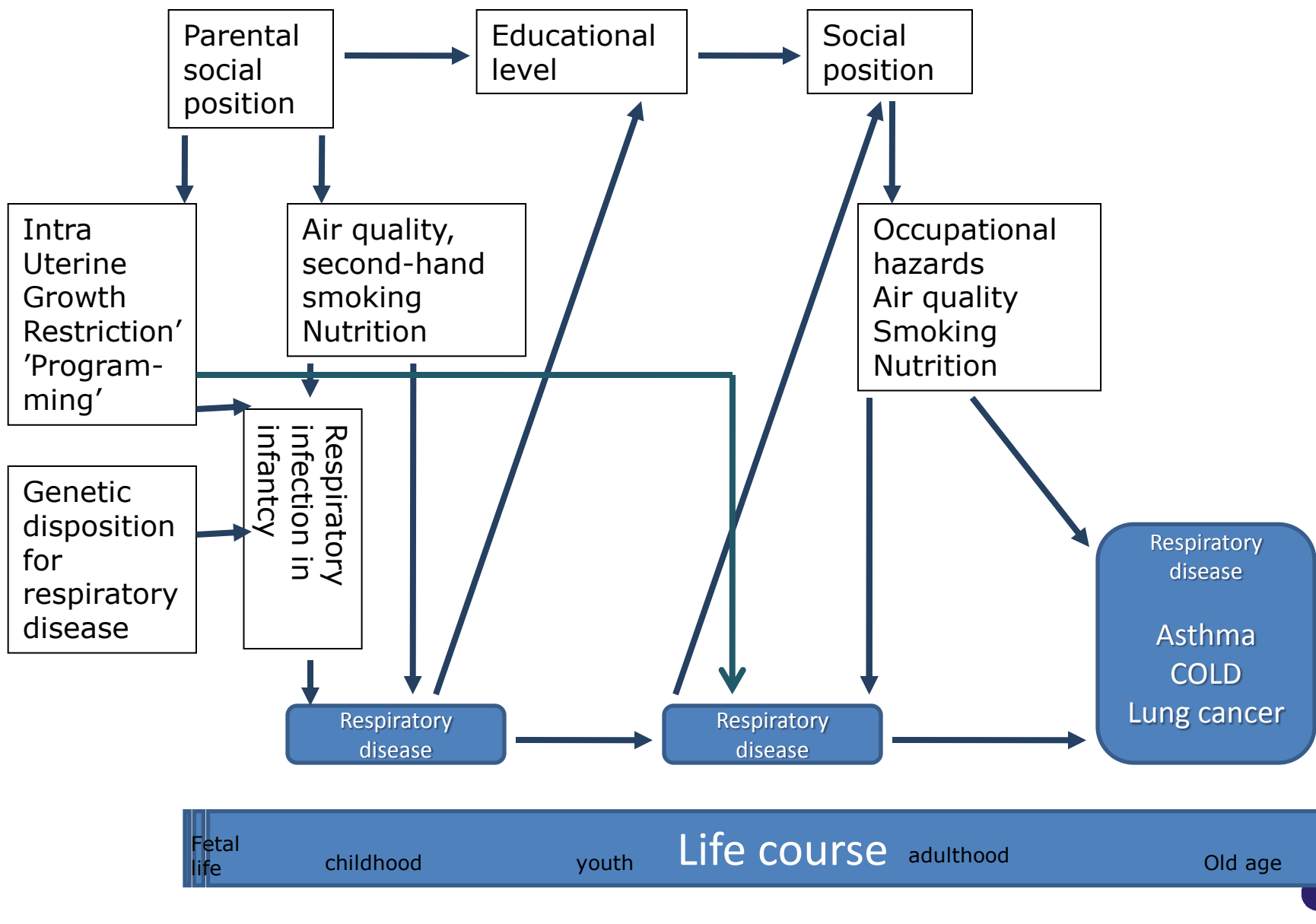
Copyright © 2008 Massachusetts Medical Society.

Table 2. (Continued.)

Disability	Subjects		P Value for Trend
	no./total no. (%)	relative risk (95% CI)	
Any medical disability severely affecting working capacity [†]			<0.001
23 Wk to 27 wk 6 days	38/359 (10.6)	7.5 (5.5–10.0)	
28 Wk to 30 wk 6 days	138/1,674 (8.2)	4.8 (4.1–5.7)	
31 Wk to 33 wk 6 days	272/6,548 (4.2)	2.2 (2.0–2.5)	
34 Wk to 36 wk 6 days	781/32,062 (2.4)	1.4 (1.3–1.5)	
≥37 Wk	14,286/850,437 (1.7)	1.0 (reference)	



A life-course model for respiratory diseases (eg. asthma, COLD, lung cancer)



A life-course approach to health inequalities

Article 1

All human beings are born free and equal in dignity and rights.

And if not so, it may have important consequences for equity in health throughout life



PREAMBLE recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world.

PREAMBLE disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people.

PREAMBLE it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law.

PREAMBLE it is essential to promote the development of friendly relations among nations.

PREAMBLE the peoples of the United Nations have in the Charter reaffirmed their faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of men and women and have

determined to promote social progress and better standards of life in larger freedom.

PREAMBLE Member States have pledged themselves to achieve, in co-operation with the United Nations, the promotion of universal respect for and observance of human rights and fundamental freedoms.

PREAMBLE a common understanding of these rights and freedoms is of the greatest importance for the full realization of this pledge.

NOW THEREFORE THE GENERAL ASSEMBLY PROCLAIMS This Universal Declaration of Human Rights as a common standard of achievement for all peoples and all nations, to end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.

ARTICLE 1 — All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.

ARTICLE 2 — Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.

2. Furthermore, no distinction shall be made on the basis of the political, jurisdictional or international status of the country or territory to which a person belongs, whether it be an independent, trust or non-self-governing territory, or under any other limitation of sovereignty.

ARTICLE 3 — Everyone has the right to life, liberty and the security of person.

ARTICLE 4 — No one shall be subjected to slavery or servitude; and the slave trade shall be prohibited in all its forms.

ARTICLE 5 — No one shall be subjected to torture or to equal, inhuman or degrading treatment or punishment.

ARTICLE 6 — Everyone has the right to recognition everywhere as a person before the law.

ARTICLE 7 — All are equal before the law and are entitled without any discrimination to equal protection of the law. All are entitled to equal protection against any discrimination in violation of the Declaration and against any incitement to such discrimination.

ARTICLE 8 — Everyone has the right to an effective remedy by the competent national tribunals for acts violating the fundamental rights granted him by the constitution or by law.

ARTICLE 9 — No one shall be subjected to arbitrary arrest, detention or exile.

ARTICLE 10 — Everyone is entitled in full equality to a fair and public hearing by an independent and impartial tribunal in the determination of his rights and obligations and of any criminal charge against him.

ARTICLE 11 — 1. Everyone charged with a penal offence has the right to be presumed innocent until proved guilty according to law in a public trial at which he has had the guarantees necessary for his defence.

2. No one shall be held guilty of any penal offence on account of any act or omission which did not constitute a penal offence under national or international law, at the time when it was committed. Nor shall a heavier penalty be imposed than the one which was applicable at the time the penal offence was committed.

ARTICLE 12 — No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.

ARTICLE 13 — 1. Everyone has the right to freedom of movement and residence within the borders of each state.

2. Everyone has the right to leave any country, including his own, and to return to his country.

ARTICLE 14 — 1. Everyone has the right to seek and to enjoy in other countries asylum from persecution.

2. This right may not be invoked in the case of prosecution genuinely arising from non-political crimes or from acts contrary to the purposes and principles of the United Nations.

ARTICLE 15 — 1. Everyone has the right to nationality.

2. No one shall be arbitrarily deprived of his nationality nor denied the right to change his nationality.

ARTICLE 16 — 1. Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family. They are entitled to equal rights in marriage.

2. Marriage shall be entered into only with the free and full consent of the intending spouses.

3. The family is the natural and fundamental group unit of society and is entitled to protection by society and the State.

ARTICLE 17 — 1. Everyone has the right to own property alone as well as in association with others.

2. No one shall be arbitrarily deprived of his property.

ARTICLE 18 — Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief, and freedom, either alone or in community with others and in public or private, to manifest his religion or belief in teaching, practice, worship and observance.

ARTICLE 19 — Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.

ARTICLE 20 — 1. Everyone has the right to freedom of peaceful assembly and association.

2. No one may be compelled to belong to an association.

ARTICLE 21 — 1. Everyone has the right to take part in the government of his country, directly or through freely chosen representatives.

2. Everyone has the right of equal access to public service in his country.

3. The will of the people shall be the basis of the authority of government; this will shall be expressed in periodic and genuine elections which shall be by universal and equal suffrage and shall be held by secret vote or by equivalent free voting procedures.

ARTICLE 22 — Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality.

ARTICLE 23 — 1. Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment.

2. Everyone, without any discrimination, has the right to equal pay for equal work.

3. Everyone who works has the right to just and favourable remuneration

determined to promote social progress and better standards of life in larger freedom.

4. Everyone has the right to form and to join trade unions for the protection of his interests.

ARTICLE 24 — Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.

ARTICLE 25 — 1. Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other loss of livelihood in circumstances beyond his control.

2. Motherhood and childhood are entitled to special care and assistance. All children, whether born in or out of wedlock, shall enjoy the same social protection.

ARTICLE 26 — 1. Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.

2. Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace.

3. Parents have a prior right to choose the kind of education their child shall be given to their children.

ARTICLE 27 — 1. Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.

2. Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

ARTICLE 28 — Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized.

ARTICLE 29 — 1. Everyone has duties to the community in which alone the free and full development of his personality is possible.

2. In the exercise of his rights and freedoms, everyone shall be subject only to such limitations as are determined by law solely for the purpose of securing that recognition and respect for the rights and freedoms of others and of meeting the just requirements of morality, public order and the general welfare in a democratic society.

3. These rights and freedoms may in no case be exercised contrary to the purposes and principles of the United Nations.

ARTICLE 30 — Nothing in this Declaration may be interpreted as implying for any State, group or person any right to engage in any activity or to perform any act aimed at the destruction of any of the rights and freedoms set forth herein.





What are the important health inequalities in early life?



Even on miscarriage risk

Socioeconomic position and the risk of spontaneous abortion: a study within the Danish National Birth Cohort Educational inequality indicates a prevention potential

Table 2 The risk of spontaneous abortion according to educational level, income level and labour market attachment, respectively, in the Danish National Birth Cohort

	No. of events	Crude HR (95% CI)	Age adjusted HR (95% CI)
Educational level (n=88 958)			
BA or more (>12 years)	589	1	
Higher education (less than BA degree)	1239	1.01 (0.92 to 1.11)	1.02 (0.93 to 1.13)
Upper secondary education and vocational training	1668	0.97 (0.88 to 1.06)	1.01 (0.92 to 1.11)
Compulsory school (<10 years)	527	1.14 (1.01 to 1.28)	1.19 (1.05 to 1.34)
Income quintile (n=88 602)			
>80%	785	1	1
60%–80%	787	1.01 (0.91 to 1.11)	1.1 (0.99 to 1.21)
40%–60%	796	1.03 (0.93 to 1.13)	1.15 (1.04 to 1.27)
20%–40%	740	0.93 (0.84 to 1.03)	1.09 (0.99 to 1.22)
<20%	773	0.95 (0.86 to 1.05)	1.15 (1.03 to 1.27)
Employment status (n=84 306)			
Employed	3398	1	1
Student	295	0.91 (0.81 to 1.03)	1.03 (0.91 to 1.16)
Unemployed (>50% of the year)	128	1.04 (0.87 to 1.25)	1.01 (0.84 to 1.20)
Disability pension	17	1.61 (1.00 to 2.60)	1.32 (0.82 to 2.13)

Risks are expressed in HR.



NorCHASE



Aims:

to increase the understanding of socially patterned health inequalities with specific focus on the pre-adult life, using register- and cohort data from Denmark, Finland, Norway, and Sweden.

Specifically:

- socio-economic differentials in
- fetal death
- fetal growth
- preterm birth
- infant death, and
- child mortality



NorCHASE data

From Medical Birth Registries and Statistical Bureaus

All children born 1981 – 2000 in Denmark, Norway, Sweden, for Finland 50%, 1987-2000)

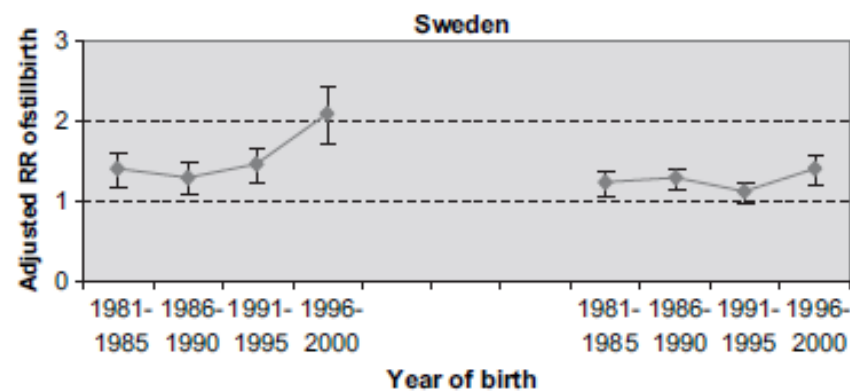
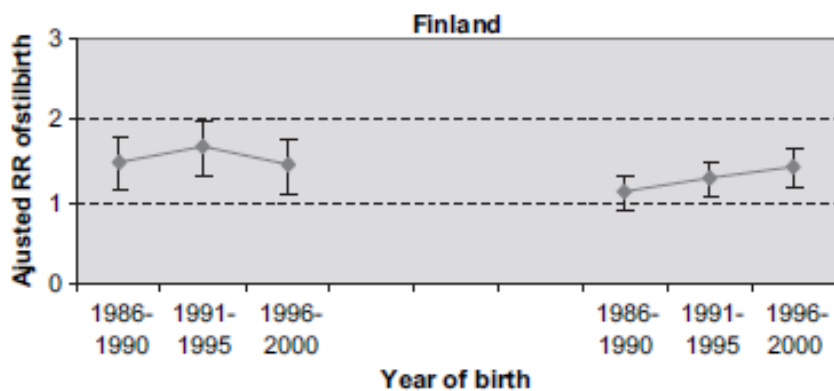
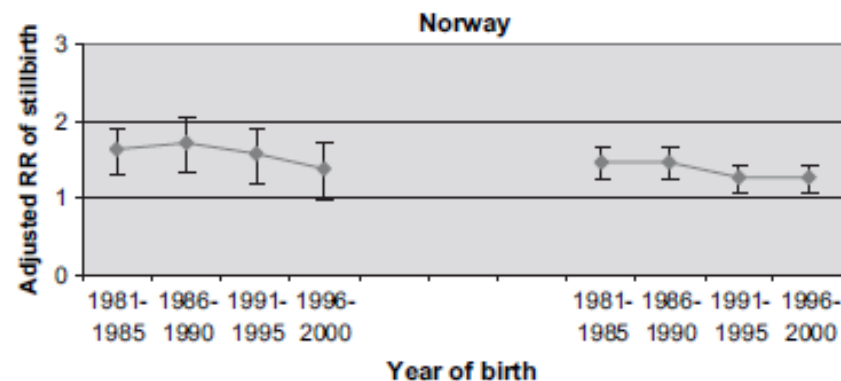
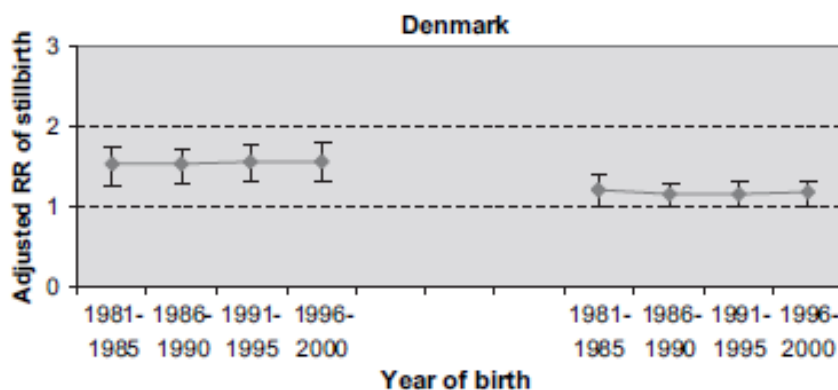
Approx. 5 mio children

- Birth weight, gest.age, plurality, sex, congenital malformations
- Follow-up until 2003: death date, causes of death
- Maternal and paternal: age at birth, ethnicity, income, highest education, occupational status, cohabitation status, parity, social subsidies





Maternal education and stillbirth



Increasing inequality in Sweden
 Highest absolute risk in Denmark:
 4‰ vs. 2.5, 3.6 og 3.5‰





Infant death

Infant death highest in
Denmark: 5.9 ‰ vs. 4.2, 5.3, og
4.7 ‰

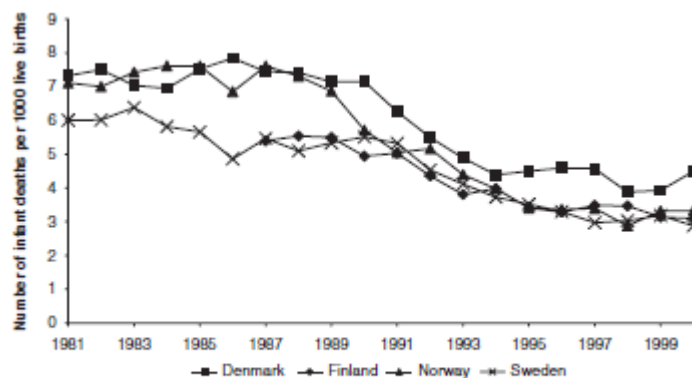


Figure 1 Infant mortality in Denmark, Finland, Norway and Sweden, 1981–2000

Increasing inequality in infant
death in DK

Both in terms of crude RR and
RII, constant in terms of RD

Neonatal mortality (0-27 days)

	Denmark			
	1981–85	1986–90	1991–95	1996–2000
Risk difference	1.28	1.09	1.70	1.33
95% CI ^a	(0.62, 1.93)	(0.47, 1.72)	(1.12, 2.28)	(0.76, 1.91)
Relative risk	1.35	1.30	1.62	1.50
95% CI ^b	(1.15, 1.38)	(1.12, 1.52)	(1.38, 1.90)	(1.27, 1.78)
Relative index of inequality	1.54	1.44	1.95	1.72
95% CI ^c	(1.23, 1.94)	(1.17, 1.79)	(1.55, 2.44)	(1.36, 2.19)

Post-neonatal mortality (28-364 days)

	Denmark			
	1981-85	1986-90	1991-95	1996-2000
Risk difference	1.36	2.29	1.75	1.14
95% CI ^a	(0.80–1.92)	(1.70–2.87)	(1.29–2.20)	(0.75–1.52)
Relative risk	1.55	1.96	2.39	2.32
95% CI ^b	(1.29–1.87)	(1.65–2.32)	(1.91–2.99)	(1.77–3.04)
Relative index of inequality	1.98	2.77	3.56	3.26
95% CI ^c	(1.51–2.61)	(2.15–3.56)	(2.59–4.91)	(2.21–4.81)

Arntzen A et al.
Eur J Public Health, 2008





Infant death

Key points

- The risk of infant death decreased considerably in all educational groups in the Nordic countries in the period 1981–2000.
- The inverse associations between maternal education and risks of neonatal and postneonatal mortality persist throughout the period of observation.
- For postneonatal mortality, the relative differences by maternal education increased over time, whereas the absolute differences decreased
- For neonatal mortality, the absolute and relative differences by maternal education decreased in Finland and Sweden, both differences increased in Denmark, whereas in Norway the absolute differences decreased and the relative differences increased.

n

Sweden

	Crude RR	95% CI	Adj. RR	95% CI
1	1.00		1.00	
2	1.63	1.36–1.95	1.50	1.25–1.81
3	1.22	1.05–1.41	1.18	1.02–1.37
4	1.61	1.34–1.93	1.45	1.21–1.74
5	1.20	1.04–1.38	1.18	1.02–1.35
6	2.26	1.86–2.76	2.06	1.68–2.51
7	1.18	1.00–1.39	1.15	0.98–1.36
8	2.57	1.93–3.42	2.49	1.87–3.33
9	1.47	1.16–1.86	1.44	1.13–1.82
10	1.00		1.00	

e 22 weeks or more in Denmark,



Preterm birth

Table 3. The risk of moderately preterm birth (32–36 completed gestational weeks) by mother's educational attainment in Denmark, Finland, Norway and Sweden

Country	Mother's education	Year of birth											
		1981–85			1986–90			1991–95			1996–2000		
		%	OR	[95% CI]	%	OR	[95% CI]	%	OR	[95% CI]	%	OR	[95% CI]
Denmark	<10 years	5.00	1.50	[1.42, 1.59]	5.15	1.55	[1.47, 1.63]	5.42	1.63	[1.55, 1.71]	5.50	1.53	[1.46, 1.61]
	10–12 years	4.10	1.22	[1.15, 1.29]	4.33	1.29	[1.23, 1.35]	4.21	1.23	[1.19, 1.30]	4.42	1.22	[1.17, 1.27]
	>12 years	3.39	1.00	Reference	3.40	1.00	Reference	3.41	1.00	Reference	3.66	1.00	Reference
Finland	<10 years ^{ab}	–	–	–	5.55	1.58	[1.41, 1.76]	4.87	1.39	[1.25, 1.54]	5.04	1.32	[1.19, 1.47]
	10–12 years	–	–	–	4.03	1.14	[1.04, 1.25]	3.98	1.12	[1.03, 1.21]	4.16	1.08	[0.99, 1.17]
	>12 years	–	–	–	3.55	1.00	Reference	3.58	1.00	Reference	3.88	1.00	Reference
Norway	<10 years	5.54	1.43	[1.33, 1.53]	6.70	1.59	[1.49, 1.69]	6.72	1.58	[1.48, 1.69]	6.51	1.45	[1.35, 1.55]
	10–12 years	4.69	1.20	[1.14, 1.26]	5.24	1.22	[1.17, 1.28]	5.40	1.25	[1.20, 1.30]	5.52	1.21	[1.17, 1.26]
	>12 years	3.95	1.00	Reference	4.33	1.00	Reference	4.37	1.00	Reference	4.59	1.00	Reference
Sweden	<10 years	6.13	1.40	[1.35, 1.46]	6.05	1.39	[1.34, 1.45]	5.89	1.44	[1.38, 1.50]	5.38	1.32	[1.26, 1.39]
	10–12 years	5.23	1.19	[1.15, 1.23]	5.16	1.17	[1.14, 1.21]	4.79	1.16	[1.12, 1.19]	4.70	1.15	[1.11, 1.19]
	>12 years	4.44	1.00	Reference	4.42	1.00	Reference	4.17	1.00	Reference	4.12	1.00	Reference

Educational gradients, esp DK & N

Difference in prevalence trends

Pedersen CB et al.
Paediatr Perinat Epidemiol 2009





Social inequality in preterm birth

A comparative study using European birth cohorts



A CHICOS case study



Study outline

- A comparative study looking at the association between socio-economic position and risk of preterm birth.
- Separate analyses of data from each cohort- not data pooling.
- Compare by characteristics of countries and cohorts
 - National policies, e.g. iatrogenic deliveries
 - National characteristics, e.g. economics
 - Interpretation of socio-economic markers
 - Cohort design differences, e.g. participation
- To examine to which extent life style factors mediate social-economic disparities in preterm birth



Participating cohorts

1. Aarhus birth cohort (DK, N=93,000)
2. ABCD (NL, N=7,863)
3. BiB (UK, N=13,000)
4. CCC 2000 (DK, N=6,090)
5. DNBC (DK, N~100,000)
6. Generation R (NL, N=9,778)
7. INMA (E, N=3,944)
8. MoBA (N, N=107,000)
9. NINFEA (I, N=3000)
10. PÉLAGIE (F, N=3,421)
11. PIAMA (NL, N=4,146)
12. SNIp (D, N=4,783)



Results from the CHICOS case-study



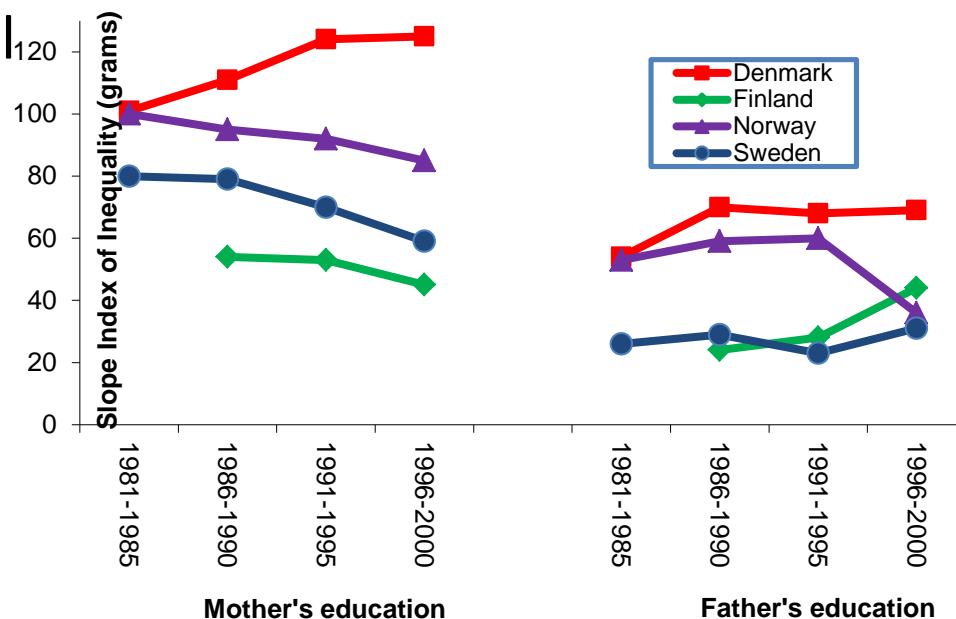


Birth weight

Disparities in all countries and both for maternal and paternal education

The largest inequality in Denmark AND increasing, in contrast to other three countries

Similar findings for SGA and when using absolute risk measures



Mortensen LH et al.
J Epidemiol Community Health 2008



Widening the inequalities ...

Participation in preventive child health examinations

Even though preventive child health examinations might be important to the health of the child, not all children do participate in them.

- Pronounced social inequality in the use of child health examinations exists in Denmark despite the fact that they are offered free of charge.
- Important risk factors for non-participation include household income, the parent's occupational and educational level as well as the number of older biological siblings.



Paediatric and Perinatal Epidemiology

Affiliated to the Society for Pediatric and Perinatal Epidemiologic Research

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Time trends in socio-economic factors and risk of hospitalisation with infectious diseases in pre-school children 1985–2004: a Danish register-based study

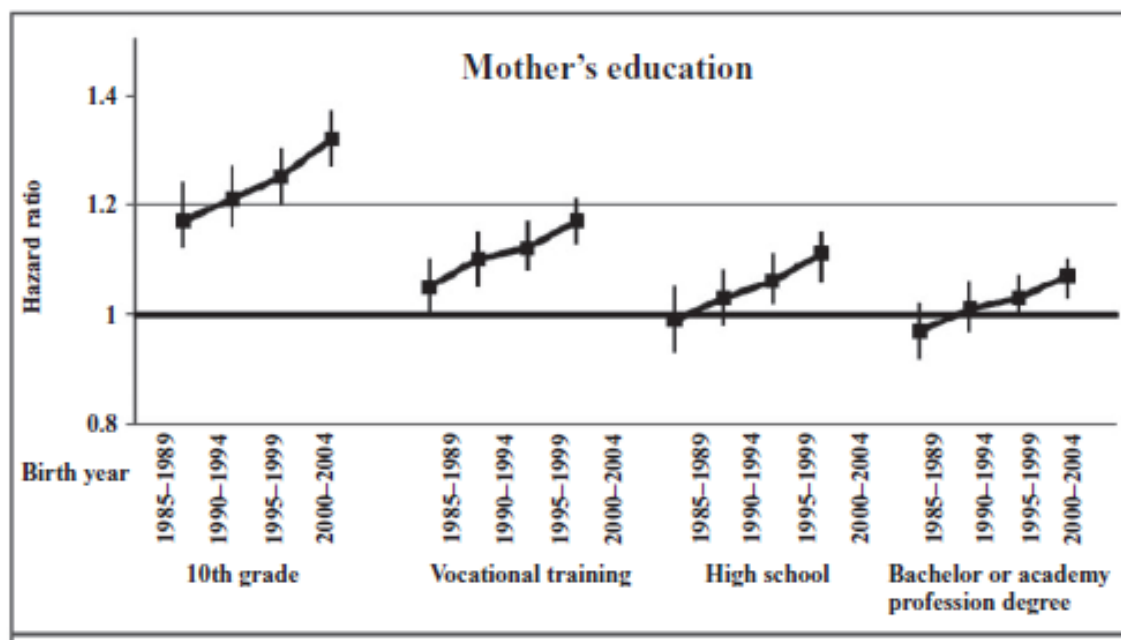


Figure 1. The time trend in hazard ratios for pre-school children (0–5 years) hospitalised for infectious diseases according to parental education. The reference group is parents with a master's degree or higher. Hazard ratios are estimated for the four 5-year intervals from 1985 to 2004. All children were born in Denmark 1985–2004. The black horizontal line represents the reference group (master's degree or higher). The vertical line (I) is the 95% confidence interval. Education is defined according to type of education: 10th grade (completion of no more than 10th grade), vocational training (e.g. craftsmen, hairdressers and waiters).



Developmental inequalities with long-term consequences



Maternal occupation	Language delay	
High grade professionals	8,4 %	
Low grade professionals	9,0 %	
Skilled	10,0 %	
Unskilled	11,3 %	
Outside labour market	15,6 %	
Students	8,5 %	

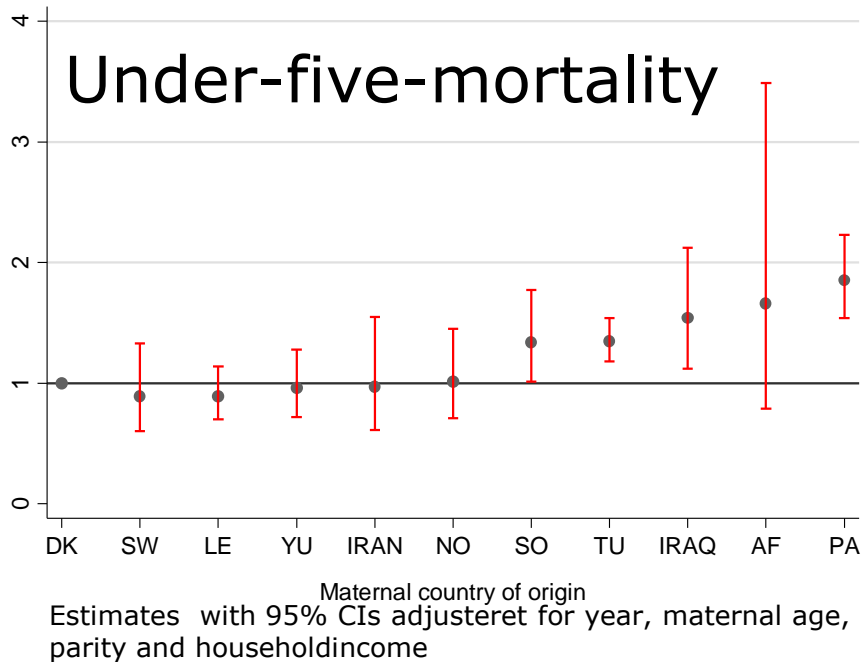


The Danish National Birth Cohort
Unpublished work



Susceptible groups

Mortality for children born in Denmark according to maternal country of origin



Petersen GS et al.
Eur J Epidemiology 2011

Table 3 Relative risks (RR) and 95% confidence intervals (95% CI) for stillbirth and infant mortality in ethnic minority groups compared with the ethnic majority, Denmark 1981–2003

	Stillbirth	Infant mortality
	RR* (95% CI)	RR* (95% CI)
Danish	1	1
Turkish	1.28 (1.07 to 1.53)	1.41 (1.22 to 1.63)
Lebanese	1.04 (0.76 to 1.43)	1.05 (0.80 to 1.38)
Pakistani	1.62 (1.25 to 2.09)	1.88 (1.53 to 2.30)
Former Yugoslavian	1.18 (0.86 to 1.62)	0.95 (0.69 to 1.29)
Somali	2.11 (1.60 to 2.77)	1.39 (1.03 to 1.89)

*Adjusted for calendar year.

Villadsen SF et al.
J Epidemiol Community Health 2009



Preterm and SGA

538 G. S. Pedersen et al.

Table 2. Odds ratios and 95% confidence interval for very and moderate preterm delivery and small-for-gestational age delivery by maternal country of origin: Denmark 1978–2007

Completed weeks of gestation at delivery Ethnic group	Very preterm (<33 weeks) Age and parity adjusted ^{ab}	Moderate preterm (33–36 weeks) Age and parity adjusted ^{ab}	Small-for-gestational age Multivariable adjusted ^{ac}
Danish	1.0 Reference	1.0 Reference	1.0 Reference
Turkish	1.4 [1.2–1.8]	1.1 [1.0–1.2]	1.3 [1.2–1.3]
Former Yugoslavian	1.3 [1.0–1.6]	1.1 [1.0–1.2]	1.2 [1.1–1.2]
Lebanese	0.8 [0.5–1.4]	1.1 [0.9–1.3]	1.8 [1.6–2.0]
Pakistani	1.6 [1.2–2.0]	1.4 [1.2–1.6]	2.4 [2.2–2.5]
Somali	1.2 [0.8–1.9]	0.8 [0.6–0.9]	2.6 [2.4–2.8]

^aAdjusted for year of delivery.^bEstimates are standardised to the age and parity distribution of the Danish-born women.^cEstimates are standardised to the age distribution of the Danish-born women and adjusted for gestational age, sex of the child and

Results: All immigrant groups had an increased risk of SGA delivery with the highest risk among Lebanese-, Somali- and Pakistani-born women: risk differences (RDs) and 95% confidence intervals [CI] per 1000 deliveries of 50.2 [95% CI 43.7, 56.7], 70.1 [95% CI 62.2, 77.9] and 85.7 [95% CI 78.5, 92.9]. Turkish- and Pakistani-born women had increased RDs of 1.8 [95% CI 0.5, 3.1] and 2.2 [95% CI 0.1, 4.2] for very preterm and RDs of 3.5 [95% CI 0.9, 6.1] and 10.2 [95% CI 5.9, 14.5] for moderate preterm delivery. Lebanese-born women had a decreased risk of very preterm delivery, RD of -1.9 [95% CI -3.5, -0.3] and Somali-born women a lower risk of moderate preterm delivery, RD of -7.8 [-12.0, -3.6]. No differences were seen for the remaining groups. The association with length of residence for most immigrant groups was U-shaped, with highest risks among recent and long-term residents.

What I am getting at

- We know that early life characteristics (e.g. birth weight and gestational age at birth) are predictive for adult mortality and morbidity
- We know that we have clear socially patterned inequalities in these characteristics
- We may not be able to tackle health inequalities before we can tackle health inequalities in early life



What to do?

- How to avoid preterm birth?
- How to improve optimal fetal growth?
- How to prevent congenital diseases?

We do not know enough about mechanisms



Recommendations in the Danish 'Marmot' Report

Determinant 1: Early childhood development

Early childhood development is impacted as early as during foetal life, and parents with low levels of education have greater risk of having children with low birth weight. The cognitive, verbal, social and emotional stimulation of the child has a huge influence on the child's further development and schooling, and thus affects the child's social position as an adult. A lack of stimulation in early development can influence the child's physical and mental health later in life.

Objectives:

- To reduce social inequality in the early cognitive, verbal, emotional and social development of children
- To reduce social inequality in birth outcomes

Policy measures:

- #1.1 Antenatal care comprising interventions that reach all women early in pregnancy and which can prevent preterm birth, low weight for gestational age, smoking of pregnant women, damaging occupational environment, etc.
- #1.2 Maternity visits by health nurses offered as a universal service to all families. At the same time, extra attention is given to reaching the socially and psychologically disadvantaged families, including families with substance abuse problems
- #1.3 Active outreach measures to ascertain that children with restricted social and cognitive development attend the preventive child health examinations at the general practitioner
- #1.4 Complete coverage and active recruitment of children with special needs through day care institutions and kindergarten class
- #1.5 Elimination of childhood poverty to prevent the long-term irreversible consequences that poverty has for children



Universalism vs targeted care

- Politicians (in my country) love weak groups
- 'centered pregnancy' initiatives for disadvantaged women
- Universal care is diminishing





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ME₃U



SULIM WP2

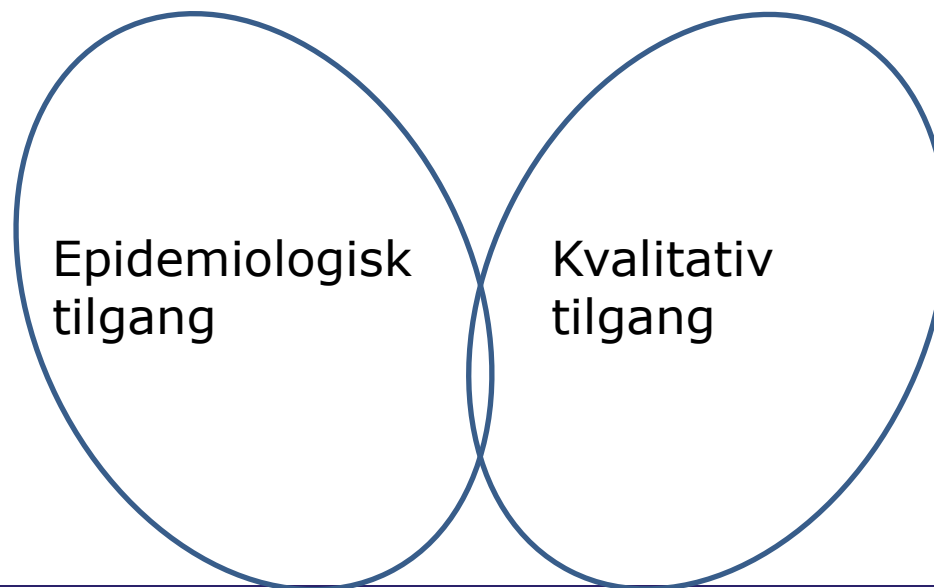
Healthy reproduction in migrants



SULIM WP2

Aims

- Investigate use of preventive care
- Investigate consanguinity as a risk factor
- Develop a model for antenatal care for migrants in Denmark





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MESU



Needs assessment phase

Epidemiologic analyses

Qualitative interviews



The intervention

- Setting: Antenatal care Midwives
- 4 antenatal clinics: **Amager, Ishøj, Vesterbro, Hvidovre**
- 5 hours course to midwives
- App og leaflet in 7 languages
- 5 min. more
- 3 dialogus meetings

