

St Anne's and the Sciences:

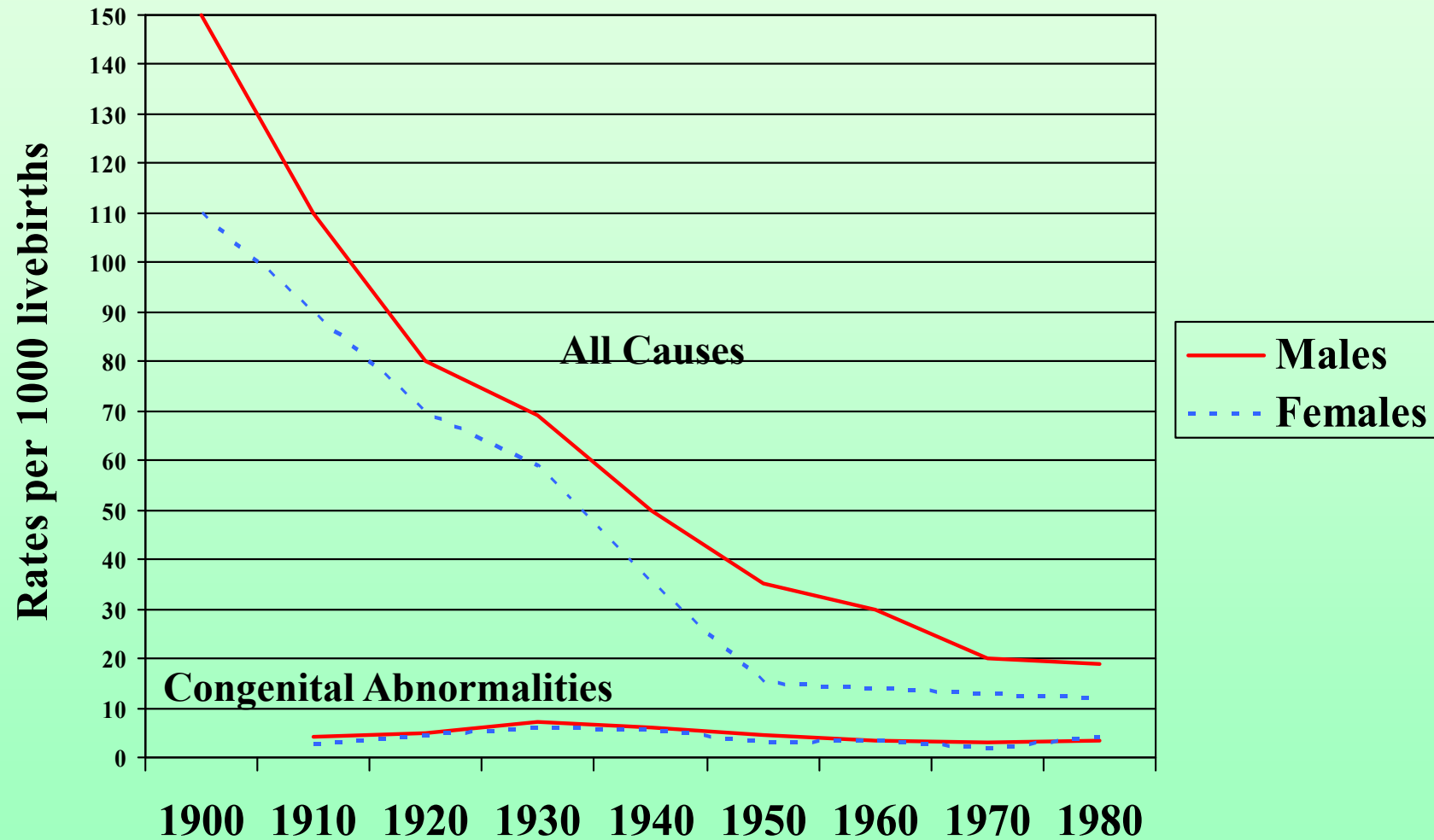
A Preparation for Chance Events

Chance events:

- Rejected statistics option
- Contact with epidemiology group in London
- Fall for the detective story that is epidemiology
- Embrace statistical methodology

Epidemiology is the search for
pattern – trends over time is a
good example

Infant mortality rates per 1000 live births, all causes and congenital malformations



Prevalence of juvenile-onset diabetes: Scotland – age 14 school medicals

Prevalence per 1000	
1969	1.0
1978	1.5
1985	2.4

(from Logan and Cole, 1988)

Prevalence of asthma symptoms; South Wales 12 year olds

	1973	1988
asthma ever	6%	12%
wheeze in past 12 months	10%	15%
>36% fall in PEFR on expiration	0.9%	2.3%

(from Burr et al, 1989)

High levels of IgE antibodies 13-14 year old girls, Japan

Year	Prevalence
1978	21%
1981	25%
1985	36%
1991	39%

(Nagkagomi et al, 1994)

Environment: “The external factors influencing the life and activities of people, plants and animals”

When to study the environment?

- Preconception
- Prenatal
- Infancy
- Early childhood
- Later childhood
- Adolescence

Environment includes:

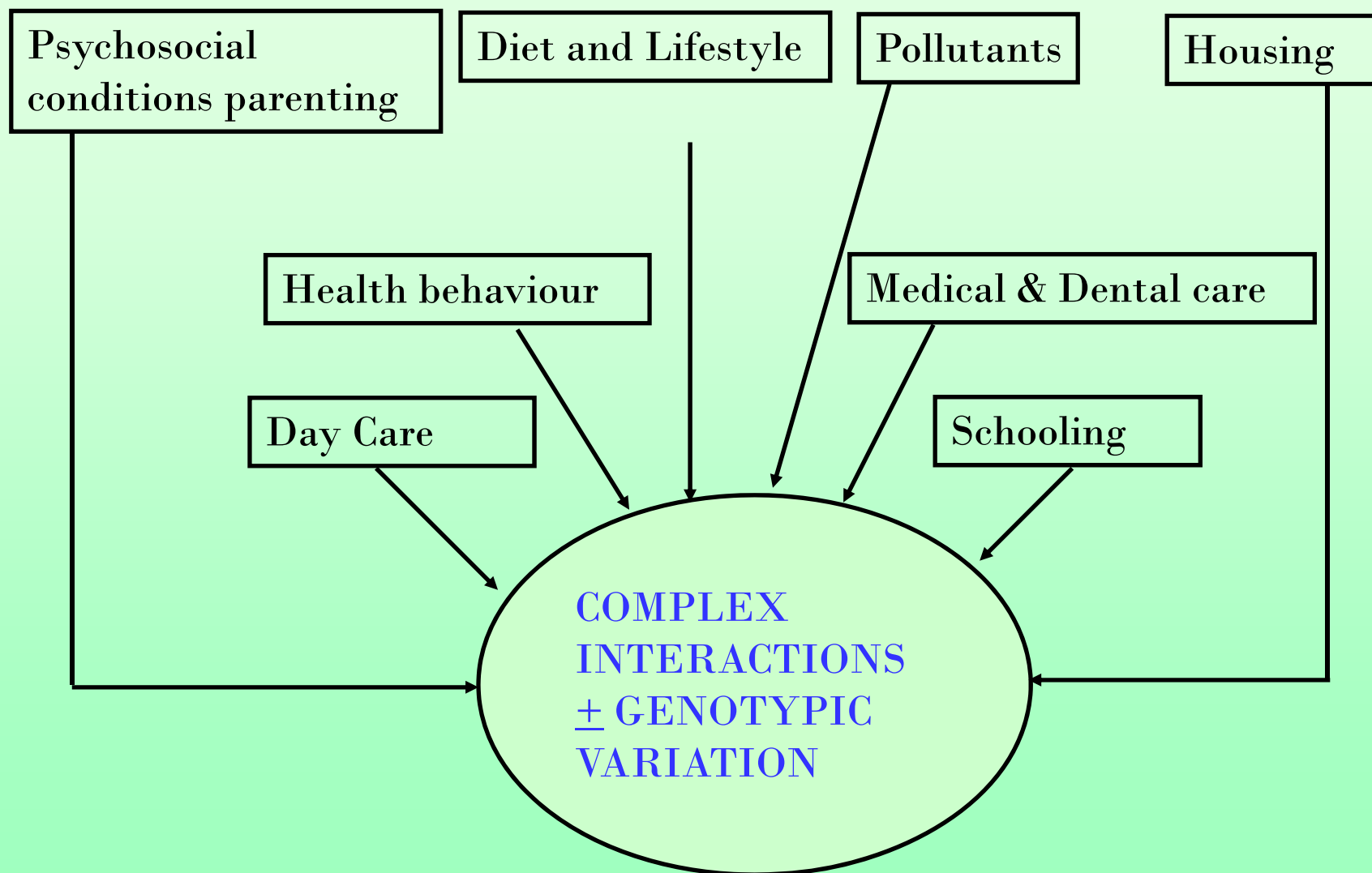
- Chemical contaminants
- Socio-economic environment
- Psychosocial influence
- Diet
- Infectious agents
- Cigarettes, alcohol, caffeine

Most large studies at the time were focussed on a particular disease. We, however, wanted to consider various aspects of the environment and see what effects (beneficial or deleterious) might result.

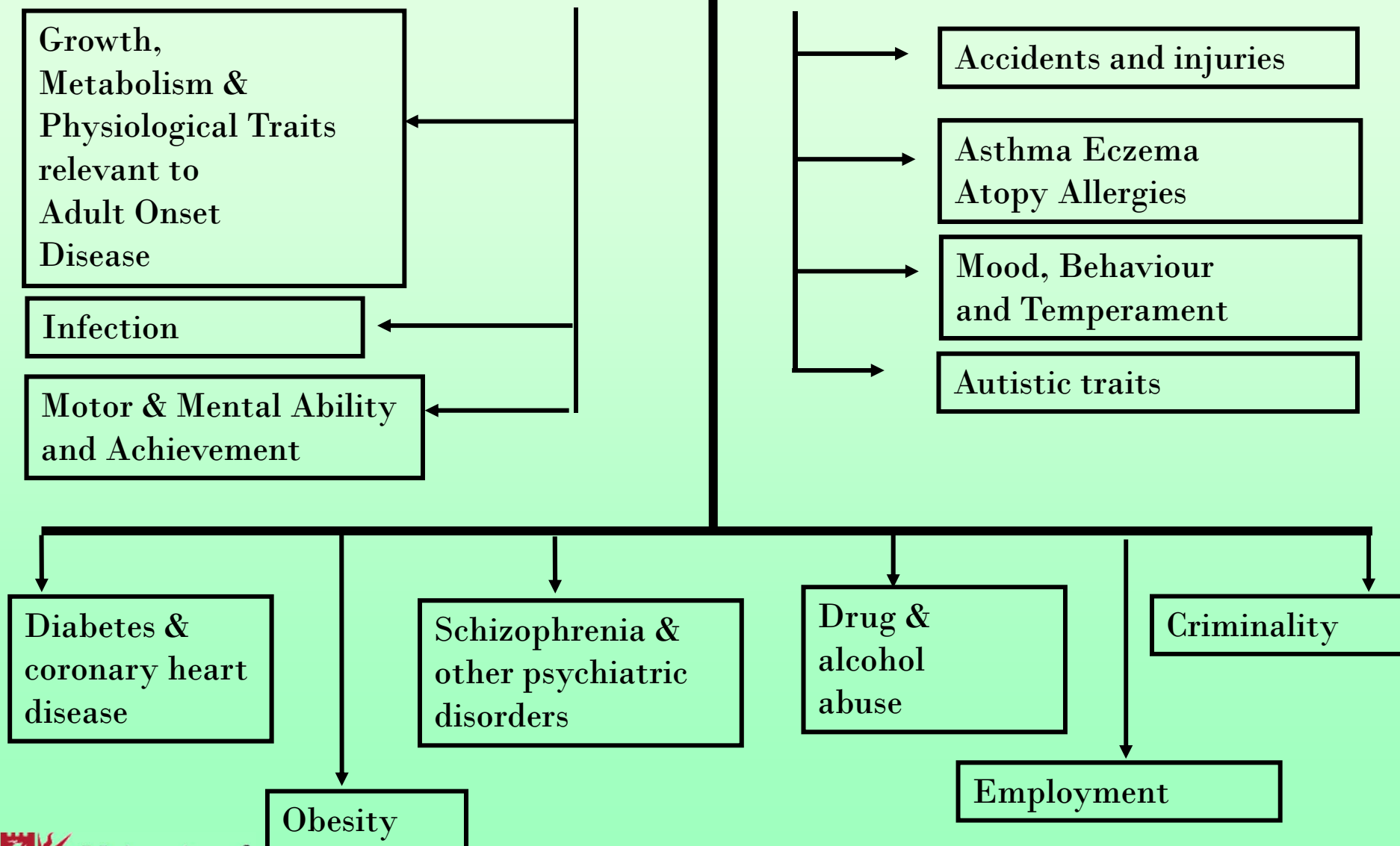
OVERALL OBJECTIVE

To understand the ways in which the physical and social environment interact, over time, with genetic inheritance to affect health, behaviour and development in children and then into adulthood.

ENVIRONMENTAL INFLUENCES



OUTCOMES WILL INCLUDE:



Approach to funders in 1989/90

Funders replied:

“We will not provide core funding but will consider funding projects based on specific hypotheses”

Hypothesis generation?

- Guesswork
- Logical deduction
- Divine inspiration
- Observation

Raising the funding:

235 grants awarded by 2005

Avon
Longitudinal
Study of
Parents
And
Children



ALSPAC

Inclusion criteria	EDD 1.4.91-31.12.92 Mother resident in Avon
Enrolled pregnancies (740 miscarriages/deaths) (~85% of total eligible)	14,541
Being followed	13,801 mothers 13,971 children

ALSPAC DATA

- Self completion questionnaires
- Health records
- Biological samples
- Environmental monitoring
- Education records
- Hands on assessments



Questionnaire No:

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YOUR ENVIRONMENT

Finding out how the environment affects mothers and their babies will help us to make the environment a healthier place.

This questionnaire asks about your environment. It asks about where you live and work, and about what you do.

All the answers you give are confidential. We would be grateful if you would answer as many questions as you can.

If there is any question you don't want to answer just leave it blank.

THANK YOU VERY MUCH FOR YOUR HELP

23/01/92

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BRISTOL



Questionnaire No:

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ABOUT YOURSELF

This questionnaire asks about your health, your partner, your home, your childhood and your beliefs and attitudes. Your answers will help us to understand how mothers' own health and background might affect their pregnancies.

All the answers you give are confidential. Your name and address will not be on the questionnaire.

We would be grateful if you would help us by answering as many of these questions as possible but if there is any question you do not want to answer that is fine. Just leave it blank.

THANK YOU VERY MUCH FOR YOUR HELP

15/07/91

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Questionnaire No:

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PARTNER'S QUESTIONNAIRE

This questionnaire asks about you and your feelings at this stage in your partner's pregnancy.

Your answers are confidential. Your name will not be on the questionnaire and none of the doctors or nurses you might see will know your answers.

Please answer all the questions you can. If there are any you cannot answer or do not wish to answer that is fine. Just leave them blank.

THANK YOU VERY MUCH FOR YOUR HELP

06/02/92

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Questionnaire No:

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MY YOUNG BABY BOY

This questionnaire is all about your baby. It asks about any problems with feeding and sleeping, waking and crying. Remember, there are no right or wrong answers. We are interested in his health and how he behaves.

We look forward to hearing from you.

THANK YOU VERY MUCH FOR YOUR HELP

31/01/92

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Questionnaire No:

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LOOKING AFTER THE BABY

This questionnaire is for the person who is mostly responsible for looking after the study baby.

It asks about your lifestyle as your baby is getting older. Your answers will help us understand what problems babies and their mothers have at this stage.

The questionnaire asks you to answer a number of questions and give your opinion about some ideas about caring for a baby. To answer simply tick the box which is most accurate in your opinion.

Some questions may seem similar, but they are not the same. Others will be the same as you have answered in earlier questionnaires. This is so that we can see how things may have changed for you.

Please answer all questions if you can even if they are similar. There are no right or wrong answers. Just tell us what you really think. All answers are confidential.

When you have finished you may make comments at the end.

THANK YOU VERY MUCH FOR YOUR HELP

10/09/92

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BRISTOL



Questionnaire No:

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BEING A FATHER

This questionnaire asks about how you have been since the birth of the baby. It asks how you are feeling, whether you are getting enough sleep and how you reacted to the actual birth.

All the answers you give are confidential. Your name and address will not be on the questionnaire.

We would be grateful if you would help us by answering as many of these questions as possible but if there is any question you do not want to answer that is fine. Just leave it blank.

THANK YOU VERY MUCH FOR YOUR HELP

06/02/92

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Questionnaire No:

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My World



14/08/00

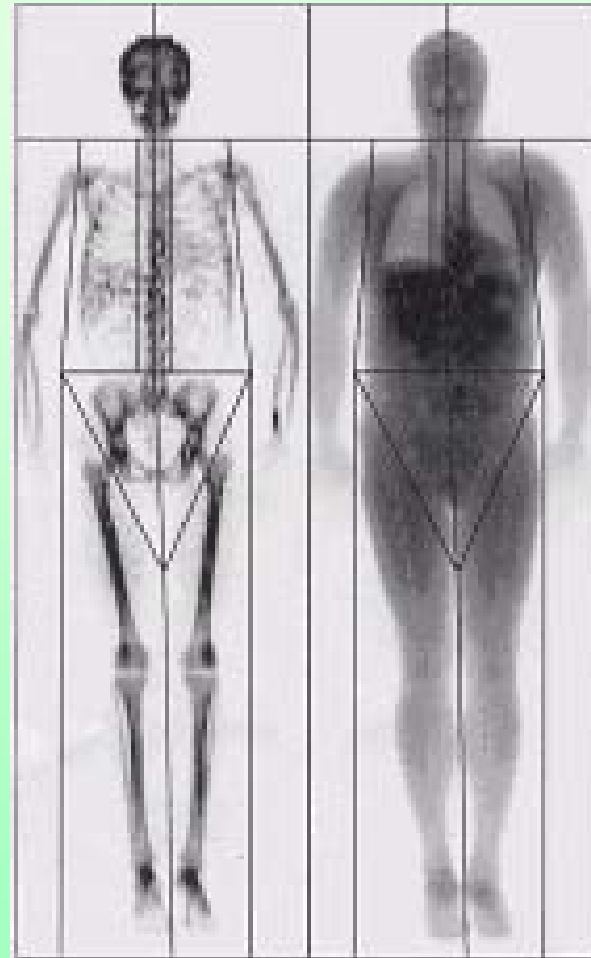
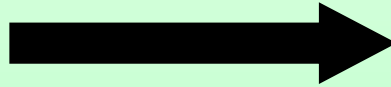
Biological samples

- Maternal blood & urine
- Umbilical cord blood & slices
- Placentas
- Children's teeth, hair and nail clippings
- Children's blood & urine

ALSPAC DATA

- Self completion questionnaires
- Health records
- Biological samples
- Environmental monitoring
- Education records
- Hands on assessments

*Bone
Density*



Importance of the University of Bristol especially

- Sir John Kingman
- Brian Pickering
- Ian Crawford

Ultimate aim of a birth cohort study

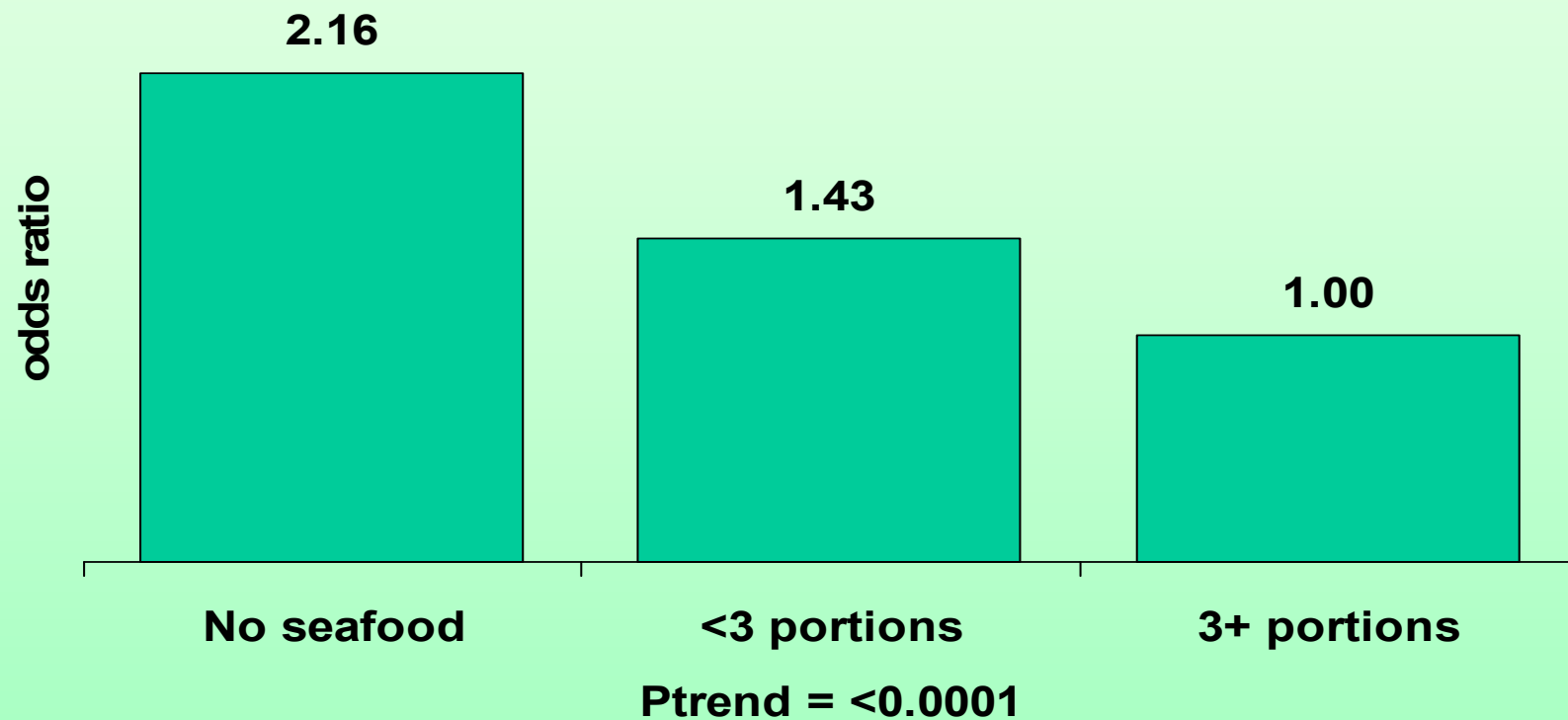
- Identifying factors influencing health and development so that preventive interventions can be put in place

What have we found?

Is fish in pregnancy dangerous for the child's development?



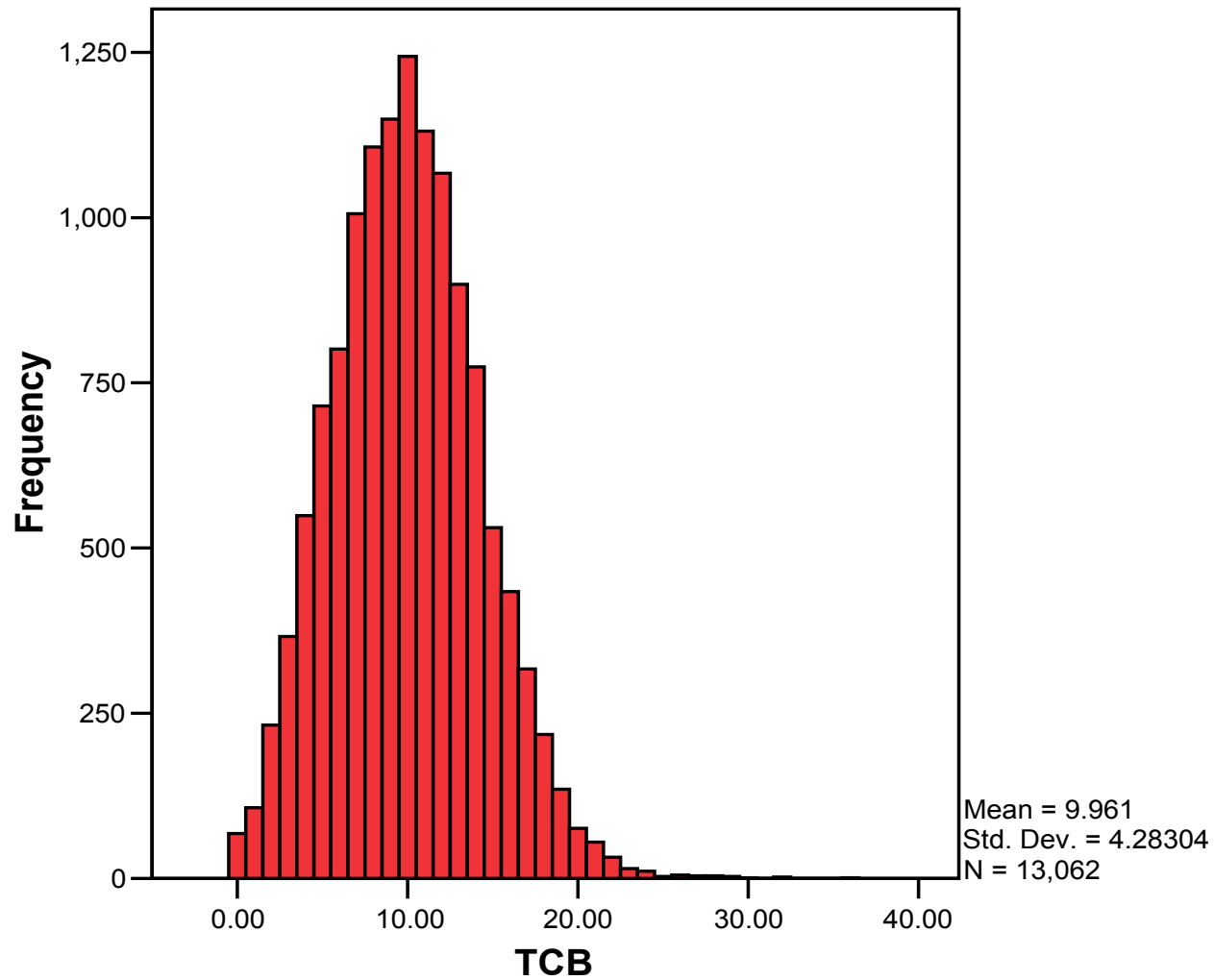
Low Verbal IQ



Total chemical burden – frequency of use of:

- **Disinfectant**
- **Bleach**
- **Carpet cleaner**
- **Window cleaner**
- **Dry cleaning fluid**
- **Aerosols**
- **Turpentine/white spirit**
- **Air fresheners**
- **Paint stripper**
- **Paint or varnish**
- **Pesticides**

Total Chemical Burden



Total chemical burden (TCB) in the home in pregnancy and risk of persistent wheeze in the child

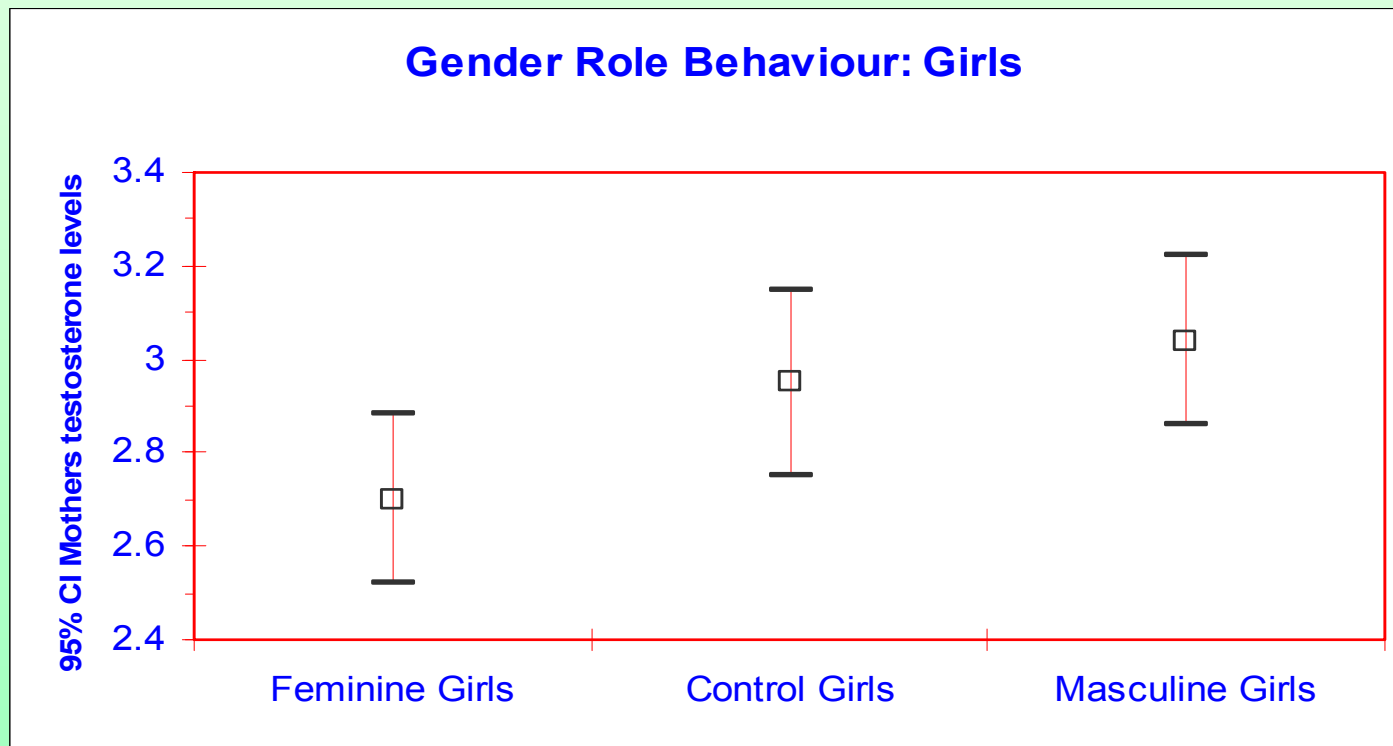
**Adjusted*
OR[95% CI]**

TCB >90 centile v. <10th	2.30[1.20,4.39]
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***adjusted for environmental tobacco smoke, maternal smoking in pregnancy, parity, crowding, pets, damp, housing tenure, gender and breast feeding**

Thorax 2005;60:45-49

Maternal testosterone levels during pregnancy and gender role behaviour in girls



Child Development 2002; 73: 1678-1687

Maternal anxiety and adjusted odds of hyperactivity in 4 year old boys

Anxiety at:

AOR [95% CI]:

**32 wk antenatal
high anxiety**

2.1 [1.5, 3.1] P<0.001

O'Connor et al. Brit J Psychiatry 2002

Odds [95% CI] of peanut allergy according to prior use of creams containing arachis oil

- Adjusted 6.81 [1.41, 32.9]

*Lack, G, Fox, D, Northstone, K, Golding, J, ALSPAC.
New England Journal of Medicine; 2003;348:977-985*

The importance of genetic analyses

- * to help identify causal pathways
- * to identify genetic effects that are contingent on the environment
- * to determine epigenetic effects

