

Exposure to Aluminium in the Children's vaccination program

Complications

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Aluminium

... the most abundant metallic element in the Earth's crust and the most widely used nonferrous metal.,

aluminum never occurs in the metallic form in nature

Production of Aluminum Expensive



Aluminium and Humans

NO known essential biological function!

BUT...since 1940's it has been used in all vaccines against diphtheria, tetanus and pertussis.

Why aluminium in vaccines?

ad·ju·vant (ad'jū-vănt).

”... a vehicle used to enhance antigenicity (??)

... a suspension of minerals (alum, aluminium hydroxide or phosphate) on which antigen is adsorbed

Latin *Ad-juvo* = **to give aid to**

Pertussis



Vaccine against whooping cough has been available since 1950s in Sweden and it was part of the recommended vaccine program for all children. It was suspended in late 1970s because of reduced protective efficacy.

Pertussis

-Used to be: Whole cell vaccine

-Future: Acellular vaccin

Pertussis-vaccine

New and better vaccine was needed!

Extensive studies in several steps in Gothenburg

70 000 children vaccinated!

Massvaccinationproject in Greater-
Gothenburg area

-1995-1999

-70 000 children

-vaccine from Denmark- SSI

Acellular vaccine was introduced in
the whole of Sweden in 1996

-another producer

Rigorous Monitoring and Evaluation

History: fear of adverse effects from vaccinations- especially neurological

A special organisation with a handfull of nurses and a few doctors supervised the vaccinated children from the beginning.

Itching subcutaneous nodules- on the arm or leg!

- Few cases were reported in the late 1990s
- Time delay most families didn't think of the connection with the vaccination Why??

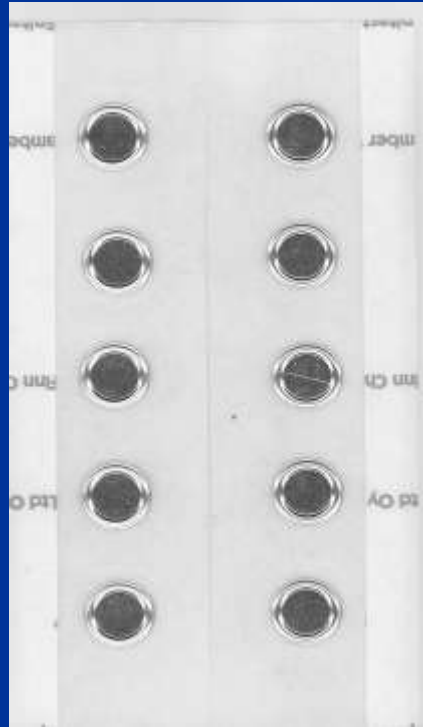
Itching subcutaneous nodule

Clemmensen O, 1980- case report about a girl hyposensitized with grass pollen

Frost et al and Veien et al 1985 and 1986 reported cases with itching nodules after vaccination

Contact allergy to Aluminium !!

ALUMINIUM



Standard method

Patch testing !!!

This metal was
not known to
react on/in
human skin

Aluminium-Contact Allergy?

Whooping cough project surveillance
- for 70 000 children

All children with symptoms of

- itching nodules** were invited to be patchtested
and also their siblings
- without symptoms.**

Aluminium-Contact Allergy?

**708 children were patch
tested**

2000-2002

Vaccin related itching nodules

Subcutaneous nodules

Severe itch

Latency after the vaccination

More excoriations than eczema

Periods without any symptoms

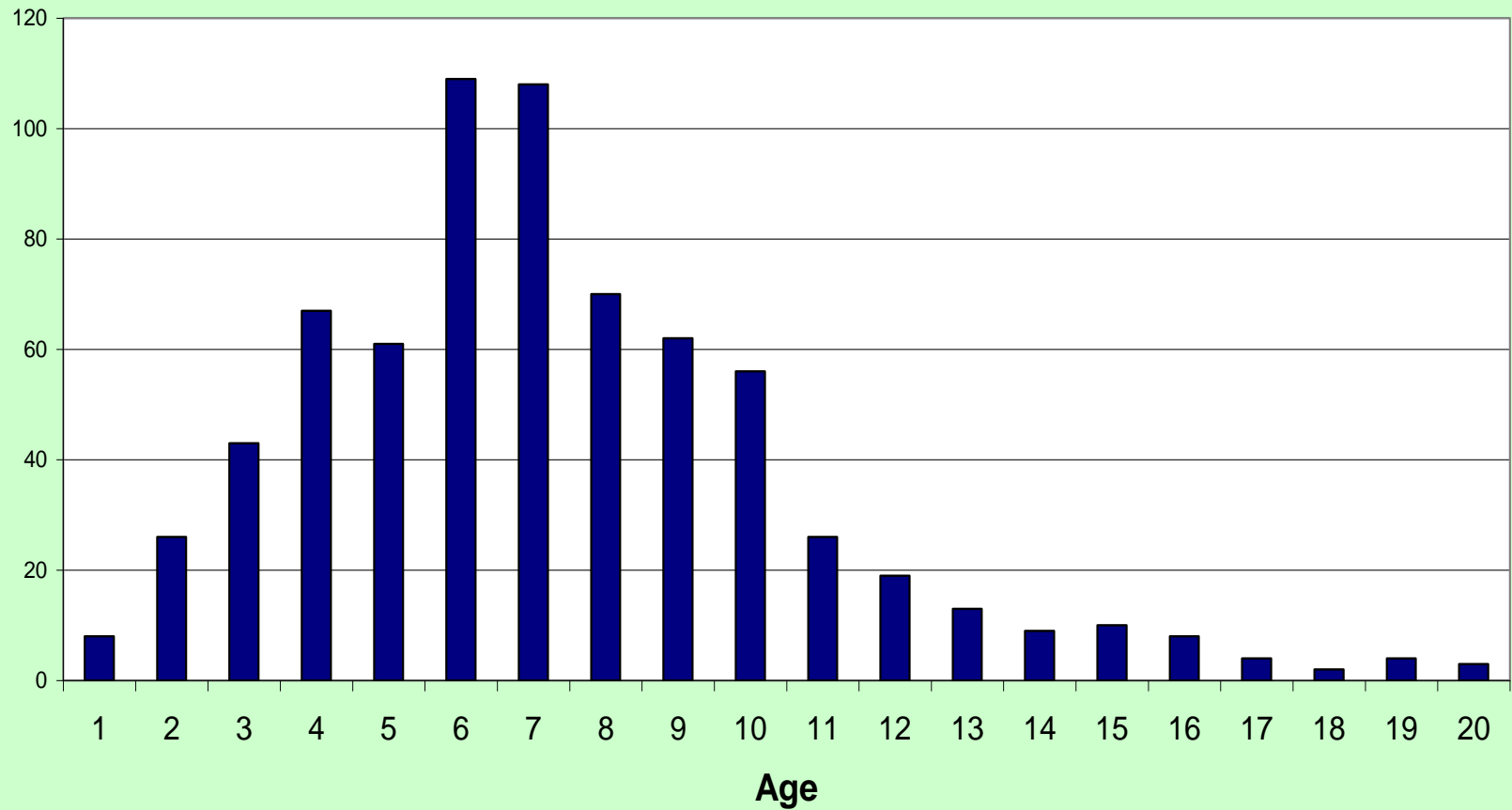
Worsening at time of infections

Years of itching, 8 years f. ex.

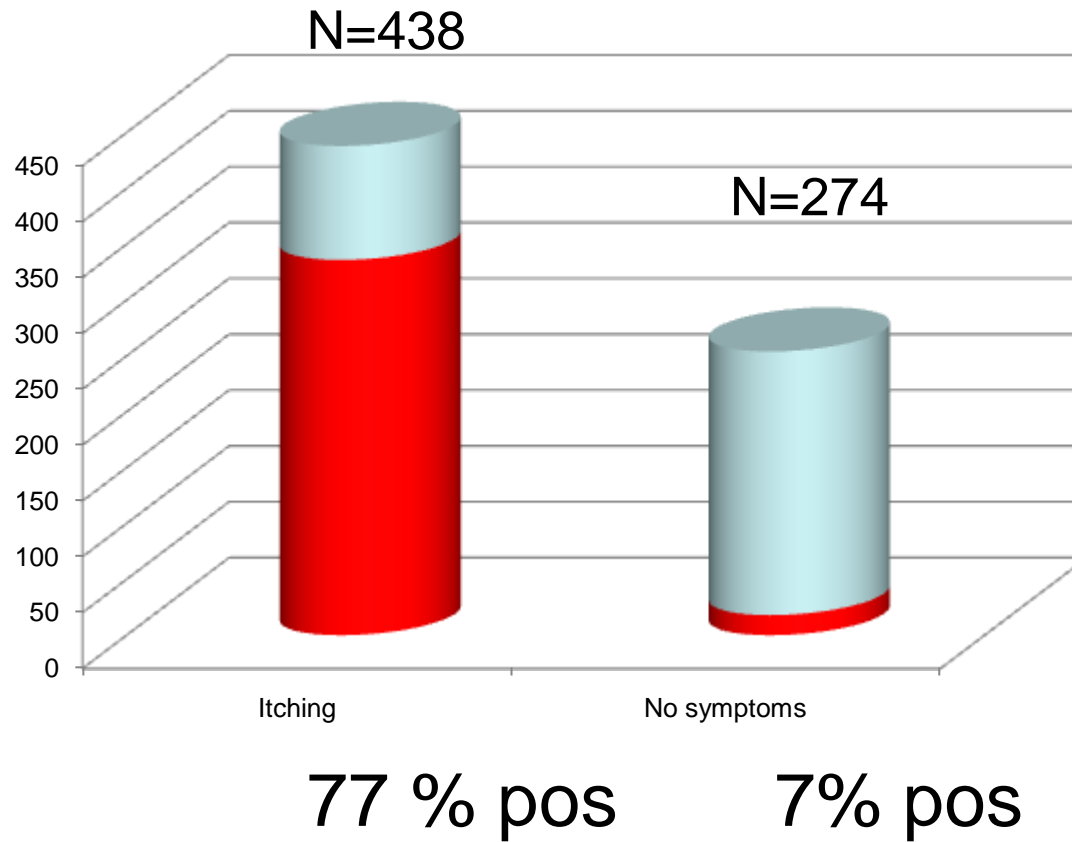
Gradually less symptoms

Age at Test, all tested; N=708

number

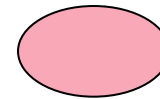
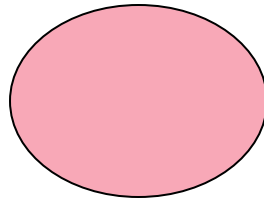
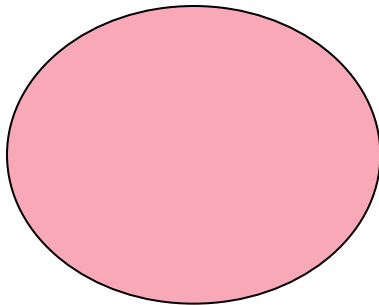


Patch test Aluminium



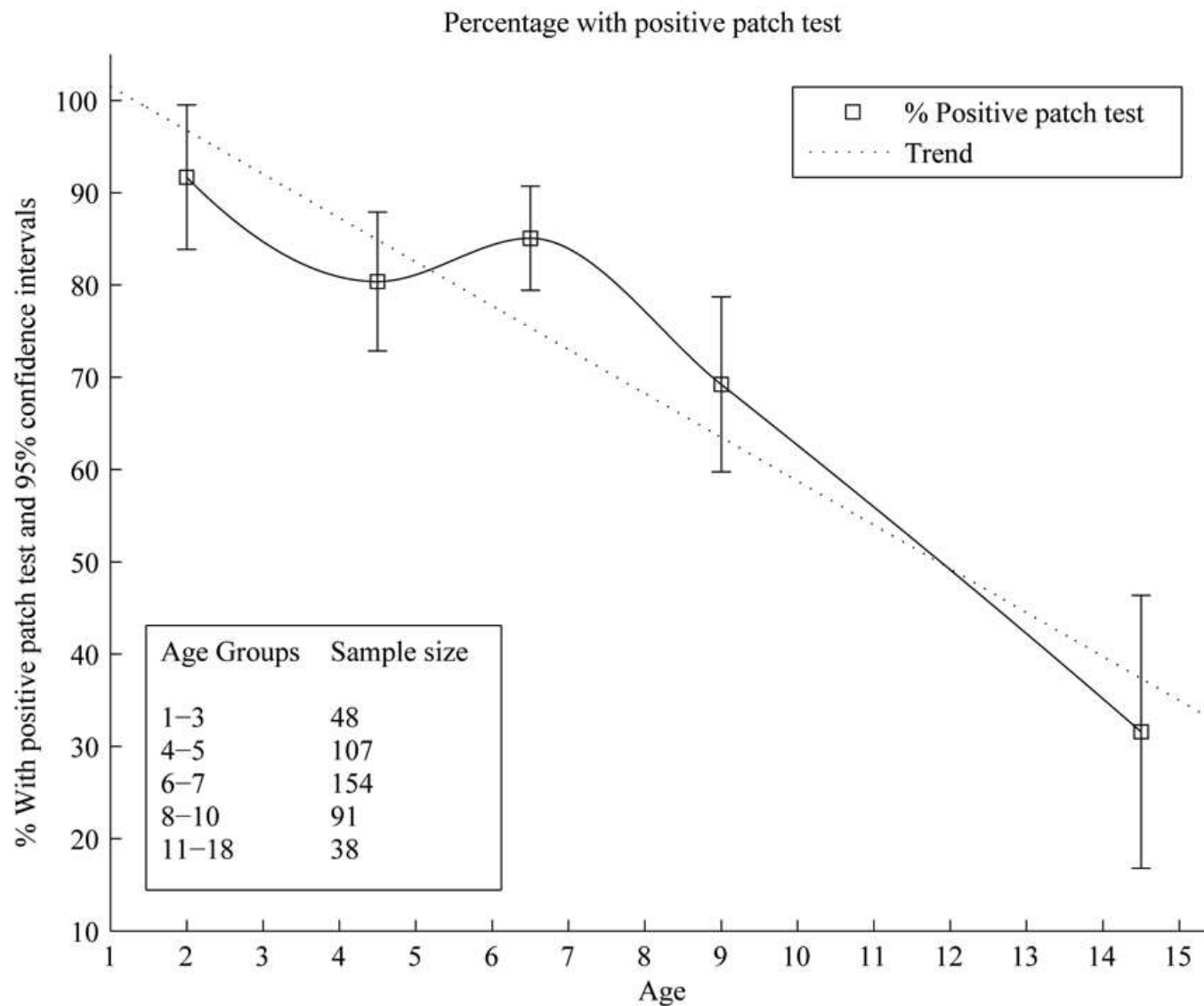


**The smaller the kid-
the stronger the
patch...??!!!**



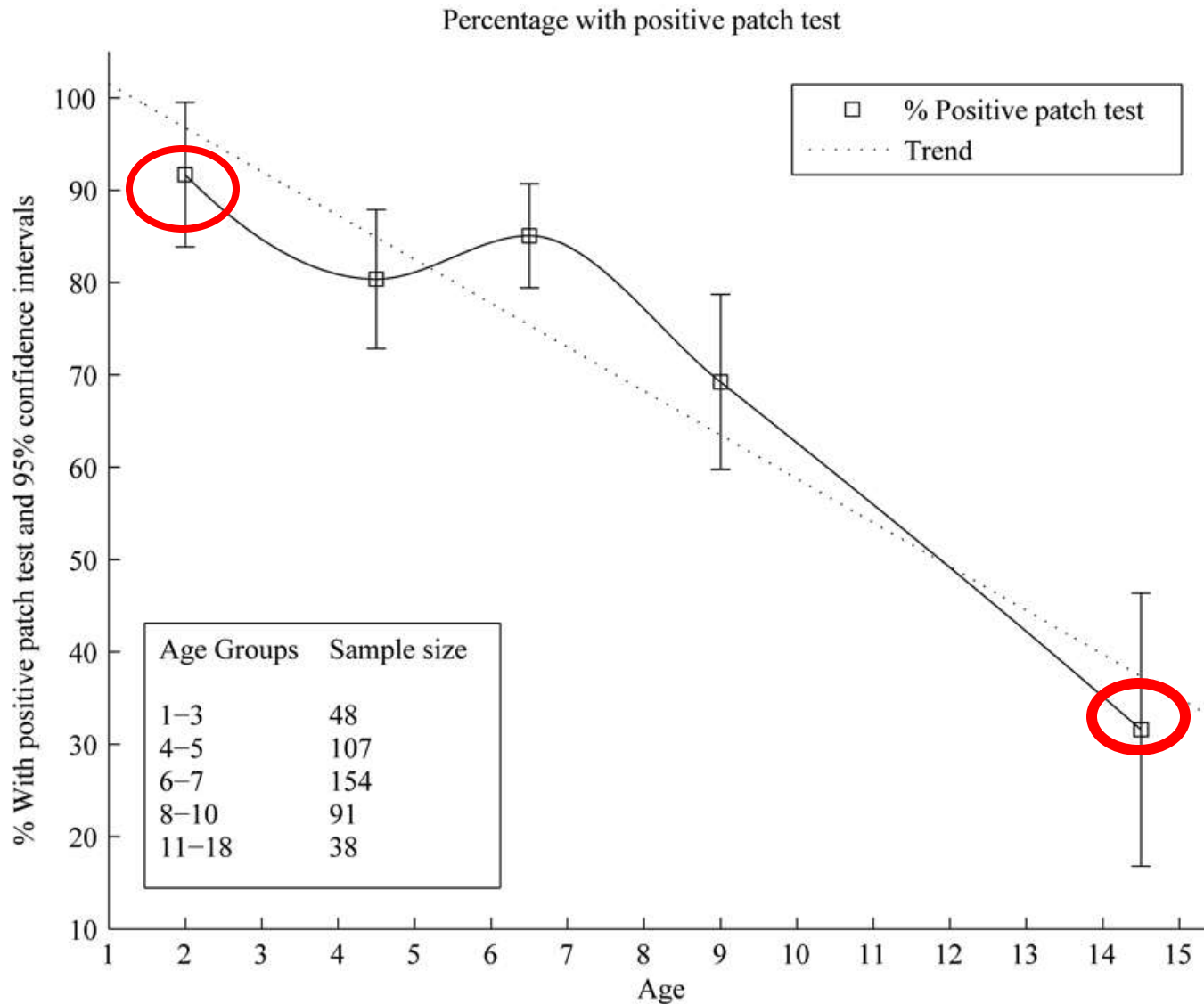
P=0.003

N=438

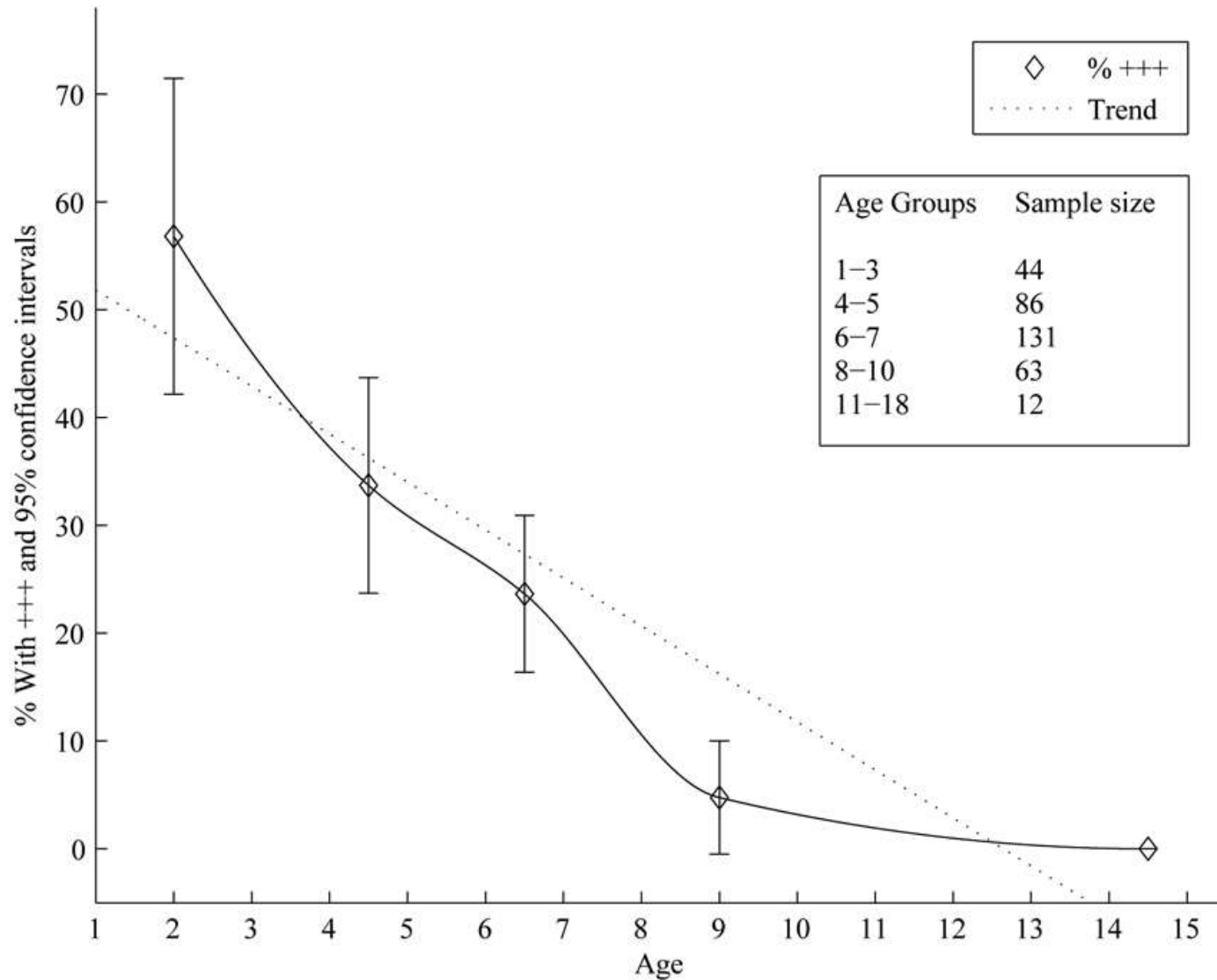


P=0.003

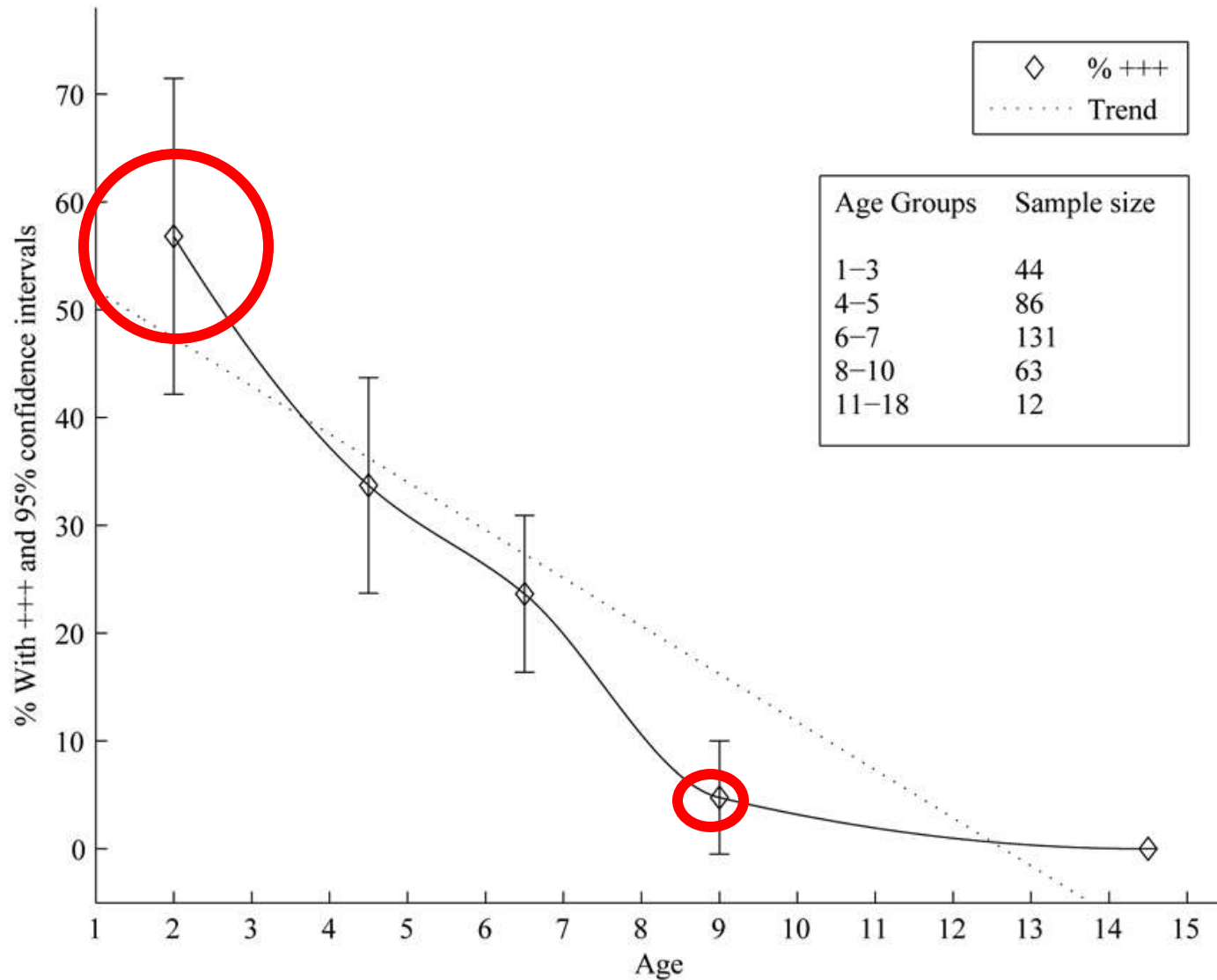
N=438

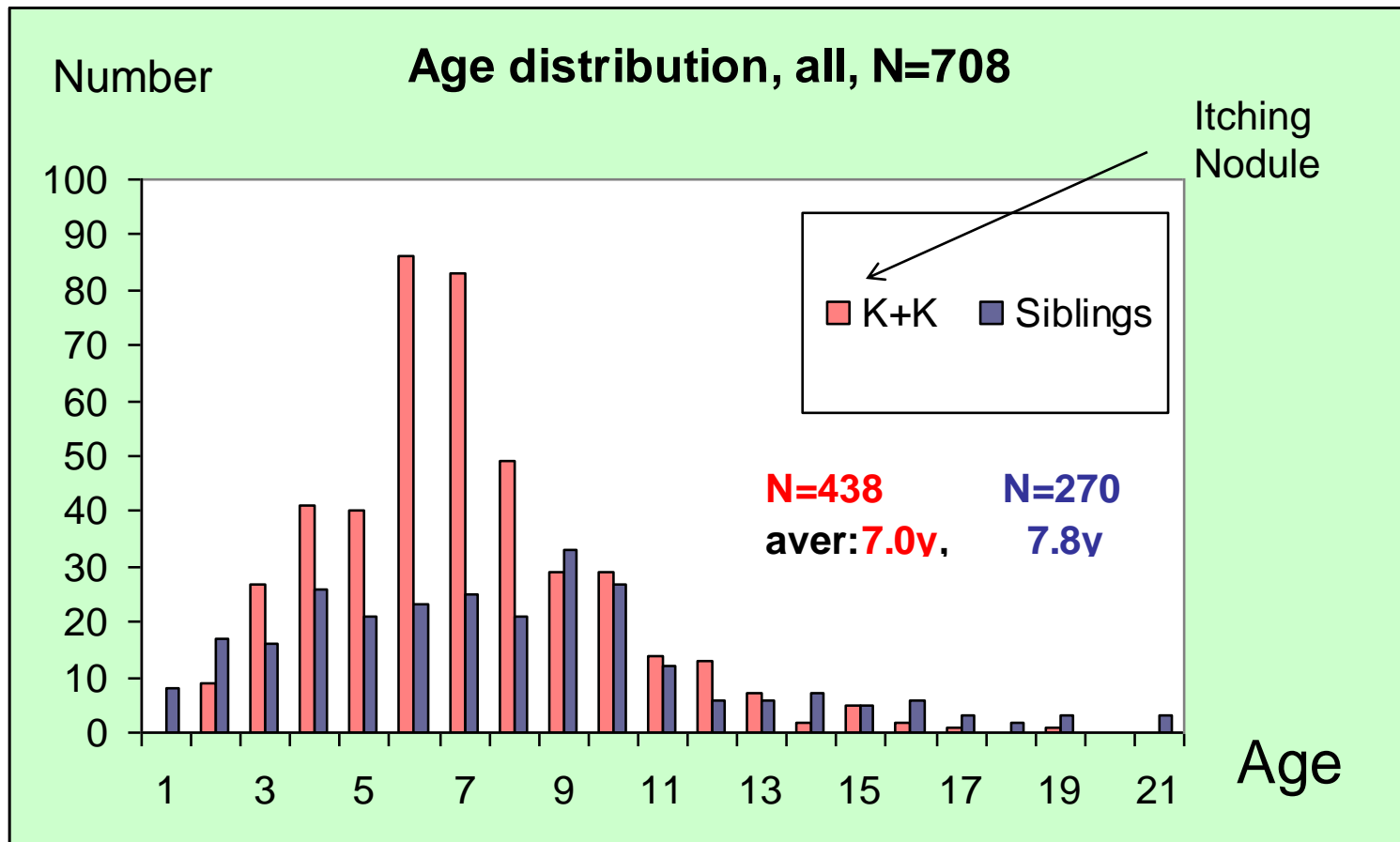


Percentage with +++ out of those with positive patch test



Percentage with +++ out of those with positive patch test





Interval between vacc nr 1 and Test: 4.7 y and 4.5 y resp

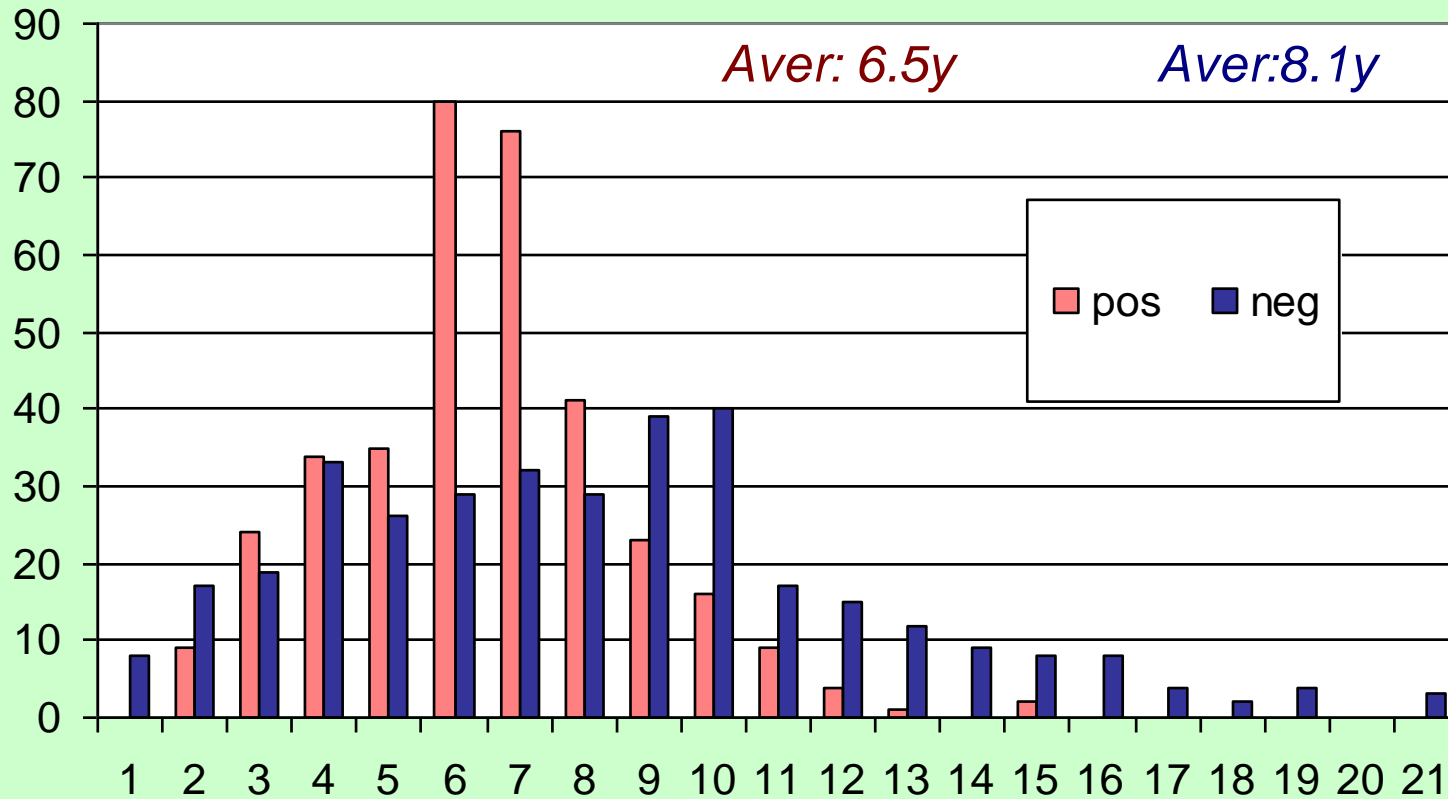
Age distribution, Aluminium-pos and -neg

N=354

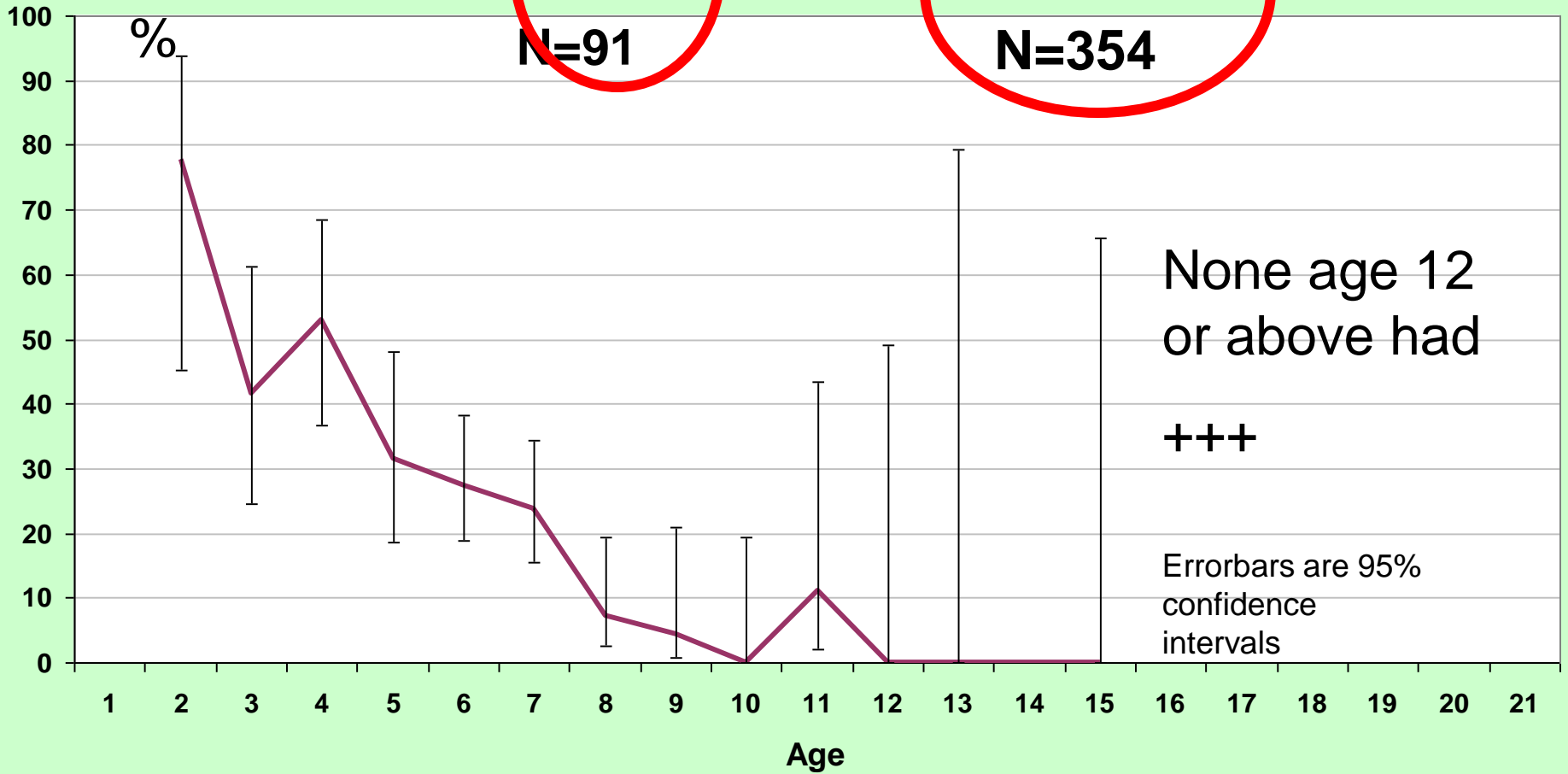
N=354

Aver: 6.5y

Aver: 8.1y



Percentage with +++ out of those with positive test



N=91

N=354

None age 12 or above had

+++

Errorbars are 95% confidence intervals

Relevance of Al-allergy?

Vaccinations

Hyposensitizations

Deodorants

Topical sunscreens

Cosmetics for children
incl. hair color spray

Metallic -industry?

Tattooing!!??



Relevance-Deodorants



Vaccines

With aluminium

Diphtheria-tetanus-pertussis,
DT and DTP

Pentavac (+hemoph infl and
polio)

Havrix (hepatitis A)

Hepatitis B

TBE

HPV

Without aluminium

Measles-Mumps-Rubella

Polio

Varicellae

Influenza

Tuberculosis

Open questions....:

What happens in the skin when the Aluminium reacts with the human immunology system?

This metal was supposed to be "inert".

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Why do younger children have a more strong reaction?

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human What happens in the skin when the Aluminium reacts with the immunology system? This metal was supposed to be "inert".

Why do younger children have a more strong reaction?

Would aluminium be approved as an adjuvanst if it should have been introduced today?

Is contact allergy lifelong?



More analysis need to be done to give light to all questions!

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Thank You!

19th EADV Congress

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Sweden - 6-10 October 2010



Woman 18 y

