

**Obligatory occupational health check  
increases vaccination rates among medical  
students**

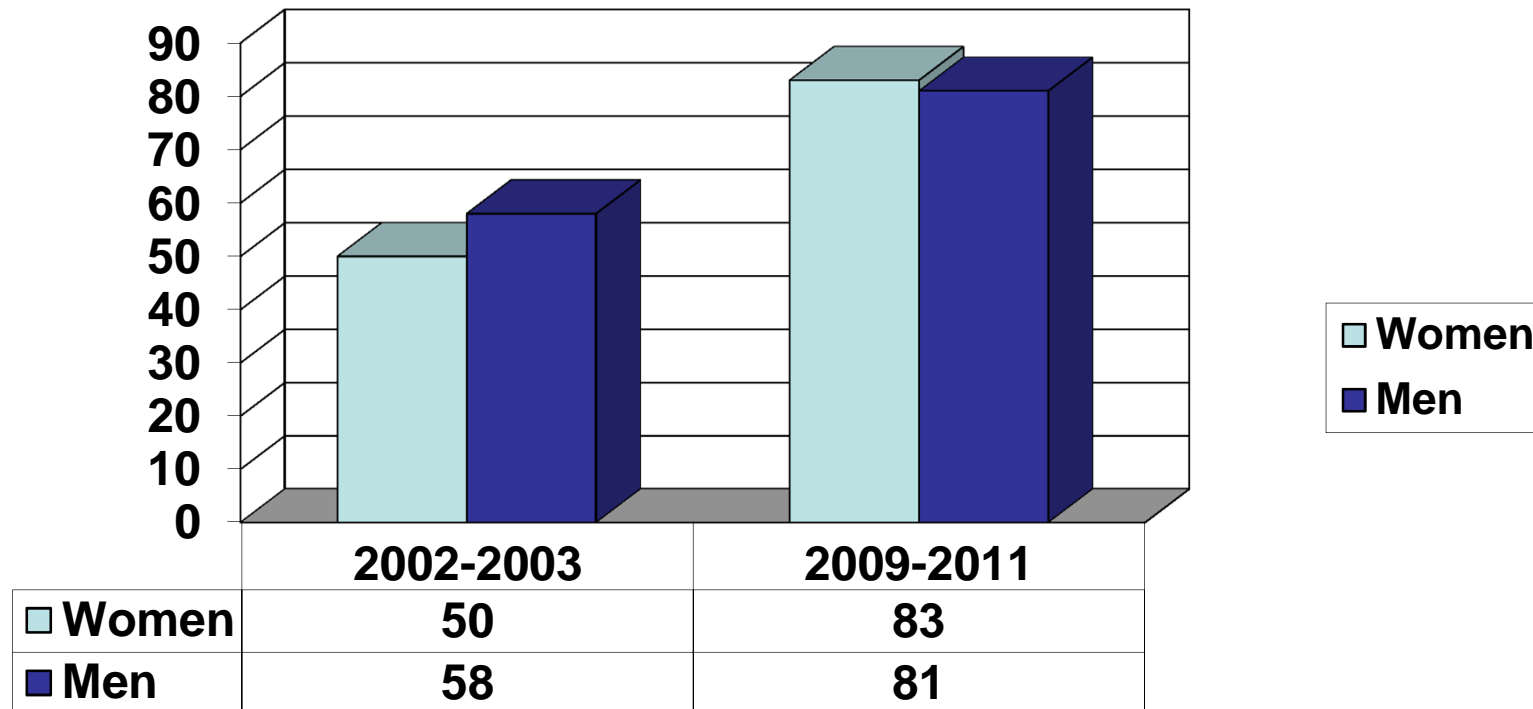
Barcelona 16<sup>th</sup> Nov. 2012

Klaus Schmid

- Since 1995 universal vaccination for infants, children, and adolescents against hepatitis B is recommended in Germany.

The health insurance bears the full costs.

# Immunisation rates (%) against hepatitis B



Medical students (beginners), not representative for German adolescents

- The German ordinance on occupational medical prevention („Verordnung zur arbeitsmedizinischen Vorsorge“; ArbMedVV) asks for obligatory occupational medical checks for employees working with risk of infection, e.g. in hospitals.
- In this context, the employer has to pay for necessary vaccinations.
- Home workers, pupils, **students**, persons employed at scientific institutions, and any other persons who work with biological agents **shall be deemed to be workers**. .....  
(§2 (8) Biological agents ordinance - BioStoffV)

- Before October 2002:
  - Voluntary vaccination against hepatitis B, free of charge, for all medical students who had successfully passed their preclinical education.
  - Obligatory occupational health check at the end of clinical education at university, before starting the clinical year

- Also in preclinical semesters, medical students work with human materials e.g. during practical courses in physiology and biochemistry
  - Medical students have contact to patients during practical courses in hospitals and nursing practice
- For medical students there is a need for an occupational medical attendance which starts already at the beginning of their study.

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  - Voluntary vaccination against hepatitis B, free of charge, for all medical students, who had successfully passed their preclinical education.
  - Obligatory occupational health check at the end of clinical education at university, before starting the clinical year
- Since October 2002
  - Obligatory occupational health check for all preclinical students
  - Obligatory occupational health check at the end of clinical education at university, before starting the clinical year

- To evaluate the effectiveness of health checks for preclinical students
- Is there a benefit for those students who already have had a medical check during their preclinical years?
- Are there positive effects e.g. on vaccination rates?
- The systematic evaluation of the benefit of a preventive measure is essential for „evidence-based prevention“



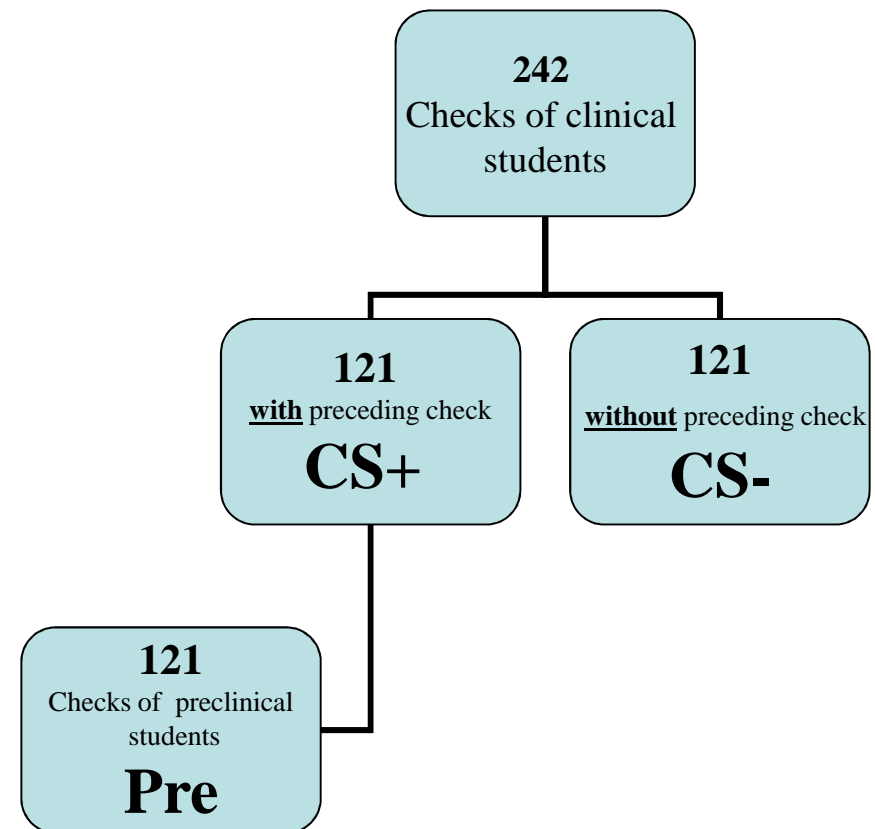
Analysis of 242 occupational health checks of clinical students (CS) from June 2005 to July 2007

Comparison of vaccination rates

Men and women were analyzed separately

Three groups

- Checks of preclinical students (PRE n=121)
- Checks of clinical students
  - With preceding preclinical check (CS+; n=121)
  - Without preceding preclinical check (CS-; n=121).



- Check of the vaccination status by a physician.
  - Sufficient protection:
    - Tetanus, diphtheria, polio, pertussis: Booster dose within the last 10 years.
    - Measles, mumps, rubella: two documented vaccinations
    - Hepatitis A and B: complete primary immunisation
- Serological tests (antibodies against hepatitis B and C)
- Voluntary vaccination against hepatitis B free of charge.
- For reasons of economy, medical students with inadequate vaccination status to other infectious diseases were informed and asked to consult their family doctor to complete their immunization (except students, who chose to specialize in pediatrics).

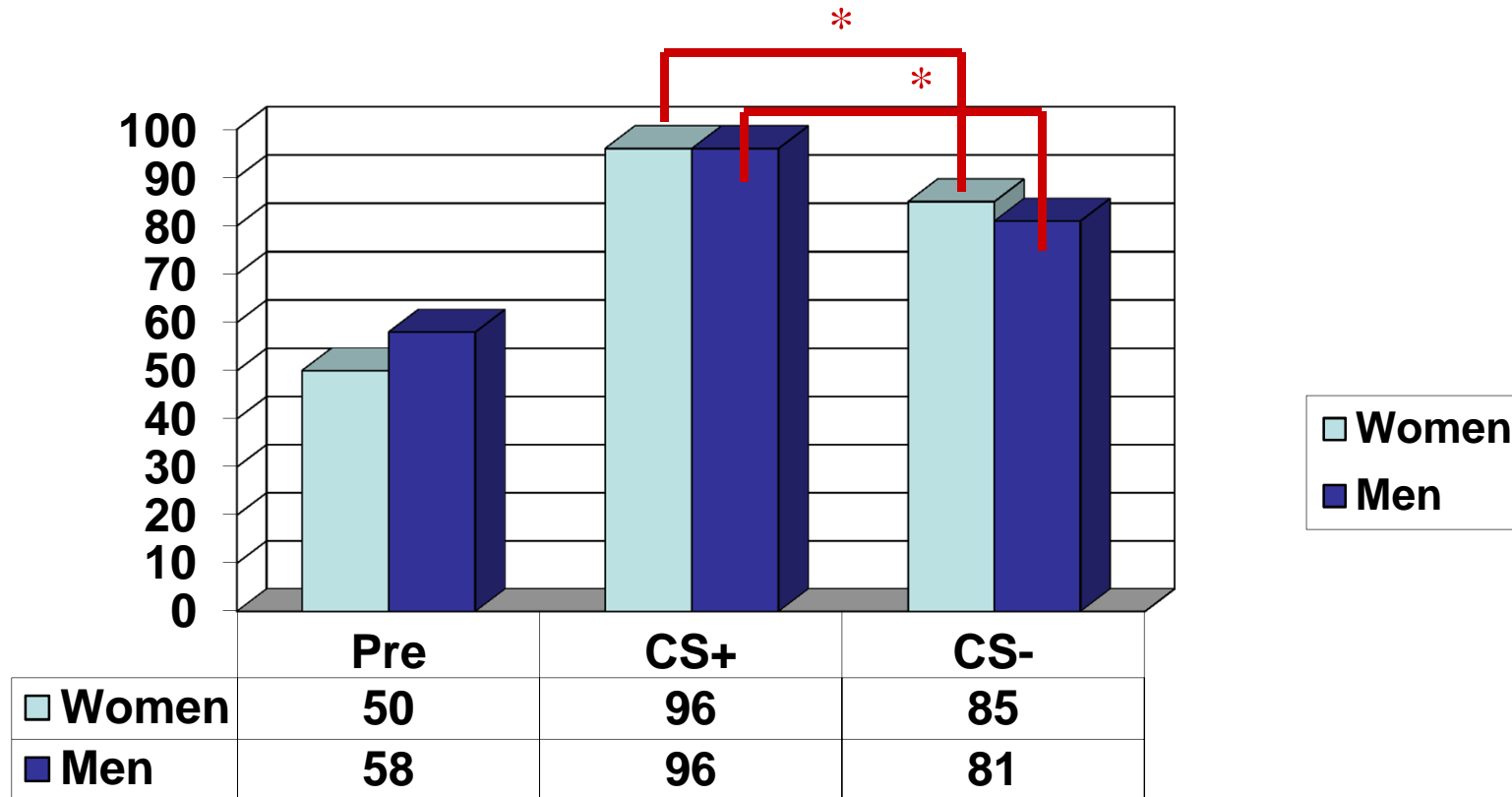
## CS+

- Age:  $26.5 \pm 3.3$  years
- female: 63%
  
- Time between first and second check:  
3.9 years (mean)

## CS-

- Age:  $27.2 \pm 3.8$  years
- female: 49%

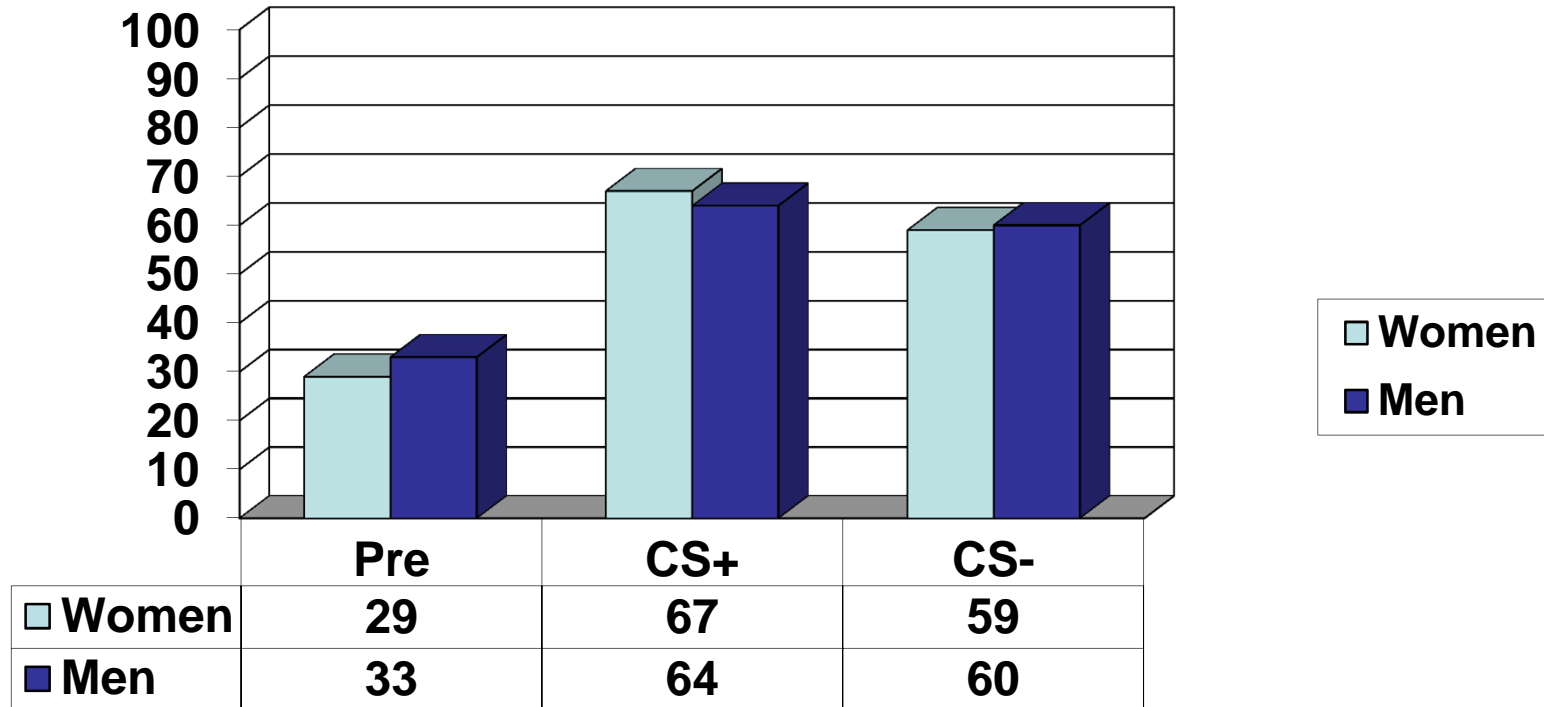
# Vaccination rates (%) against hepatitis B



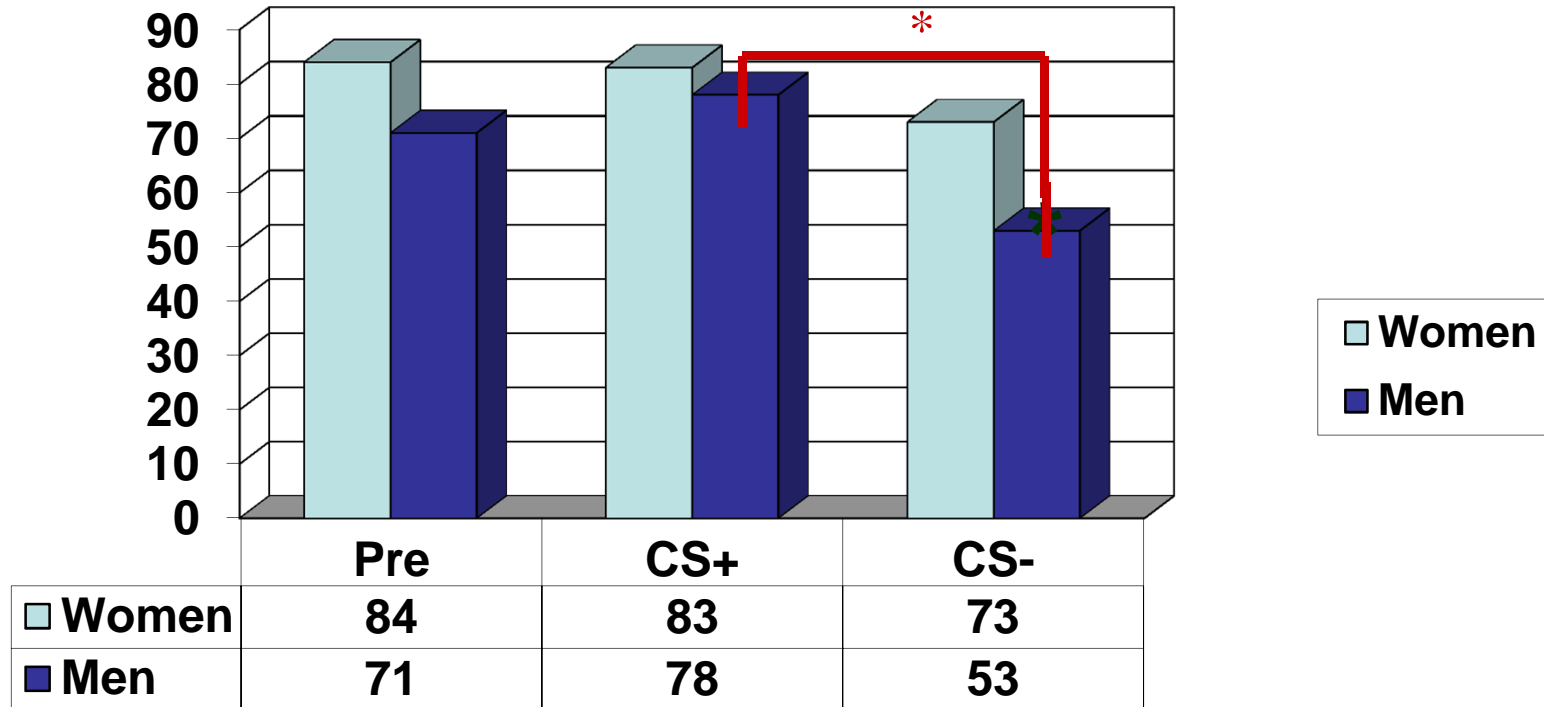
# Comparison concerning hepatitis B

	<b>CS+</b>	<b>CS-</b>
HBs antibodies	98.3 %	93.0 %
anti HBs (IU/l) (median)	857	694
A vaccination against hepatitis B was necessary	13.2%	23.3%

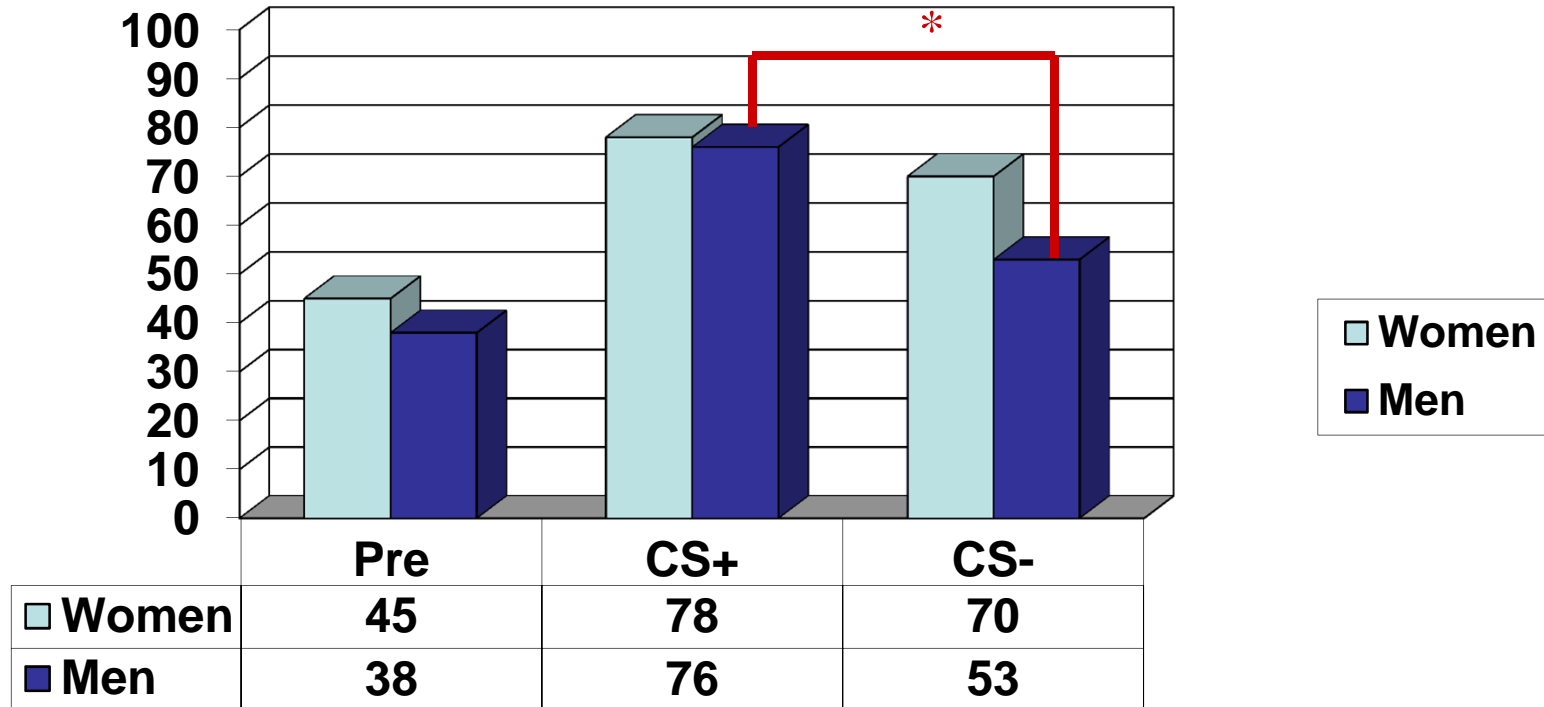
# Vaccination rates (%) against hepatitis A



# Vaccination rates (%) against tetanus

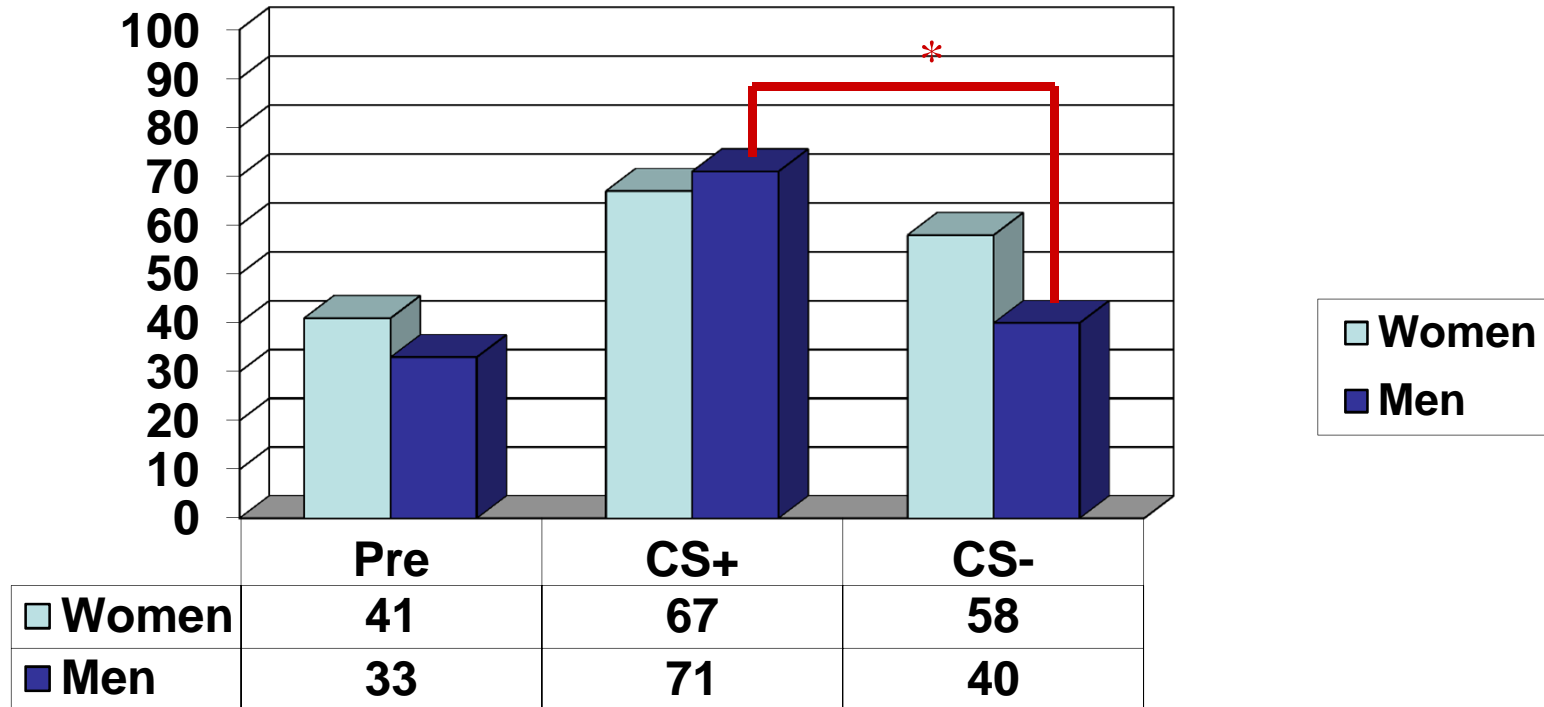


# Vaccination rates (%) against diphtheria

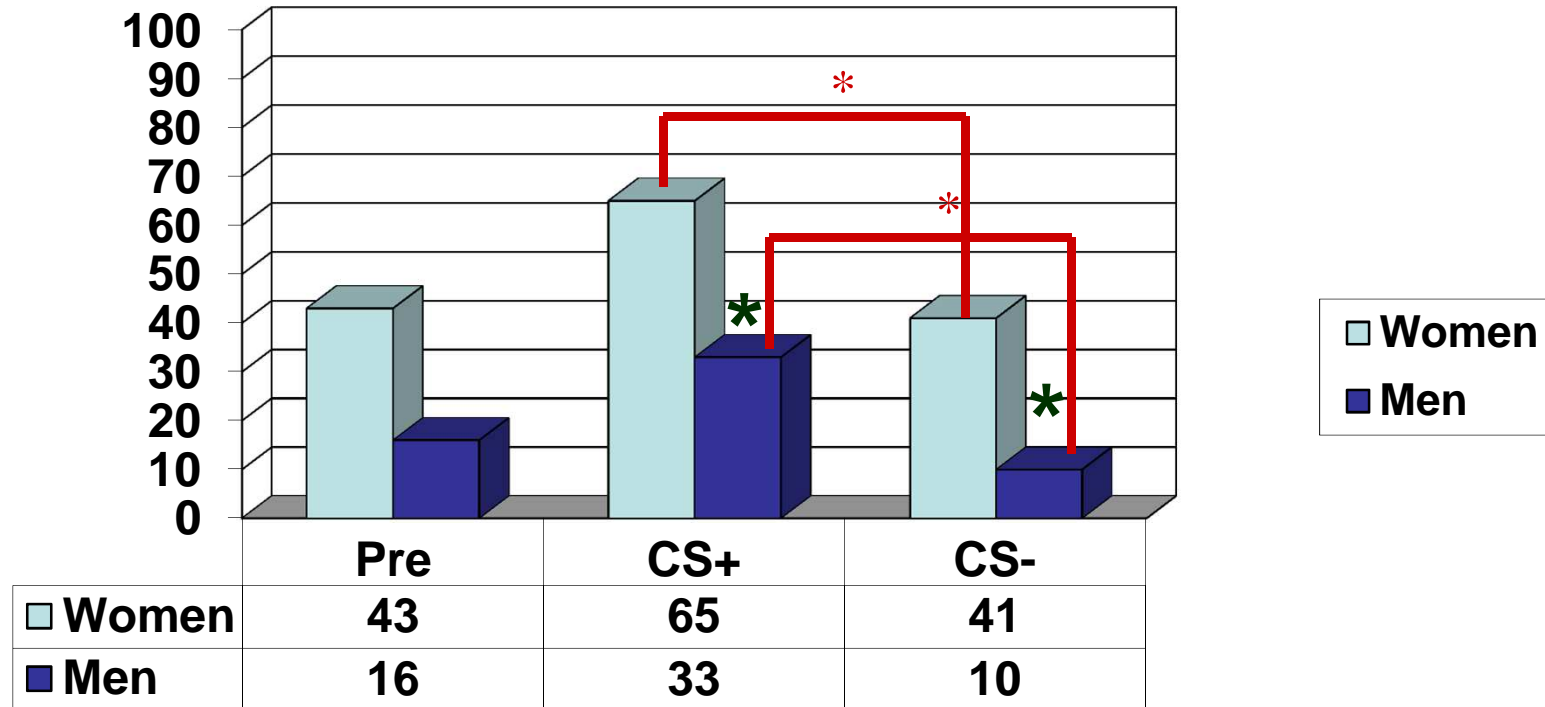




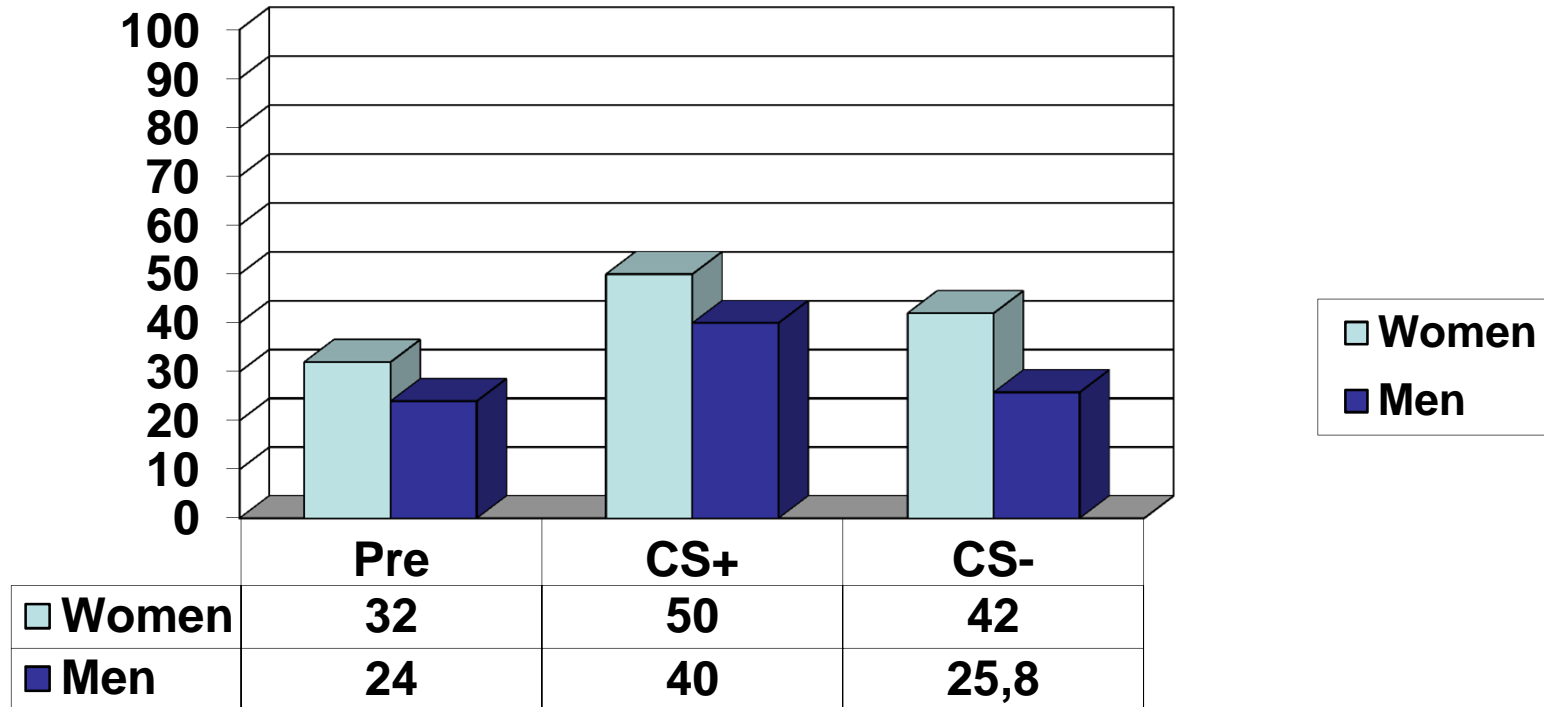
# Vaccination rates (%) against polio



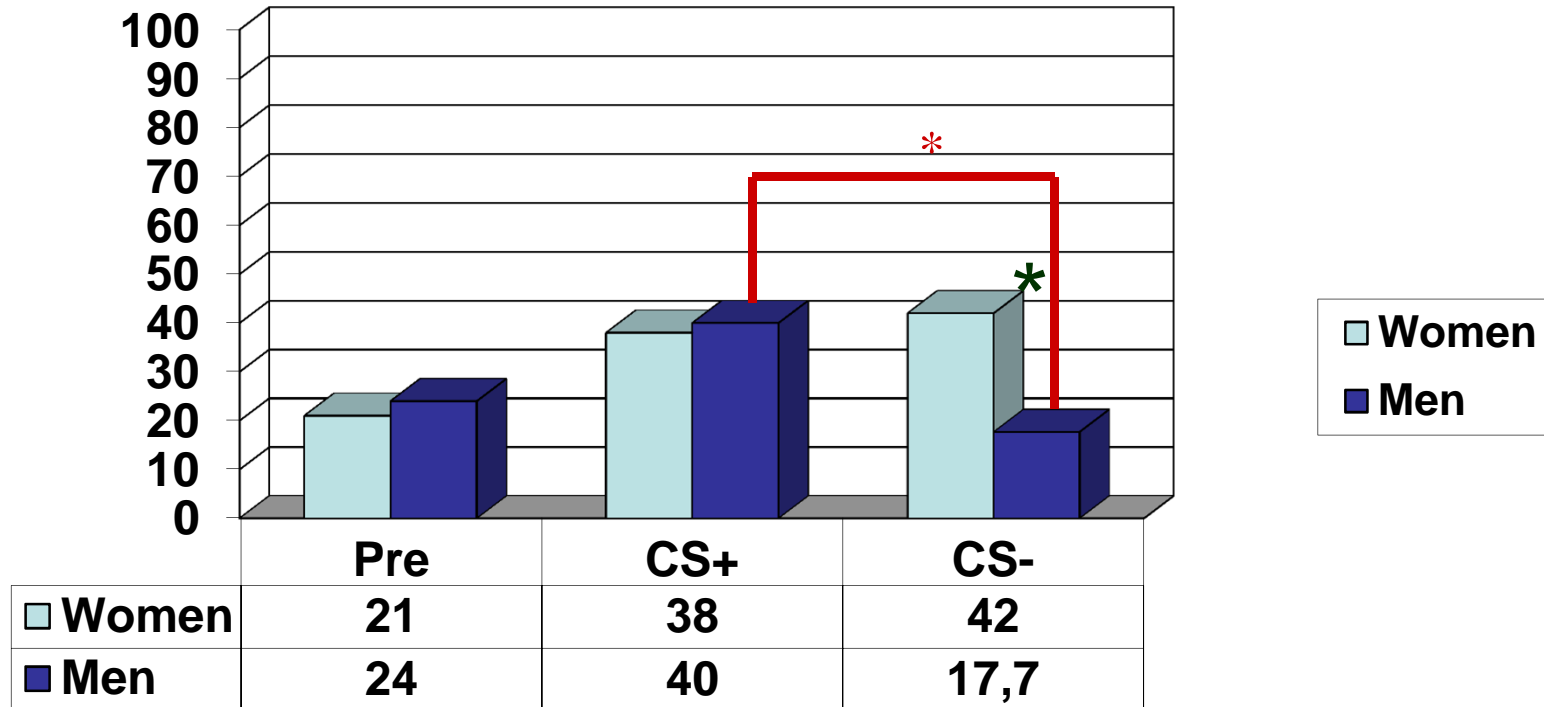
# Vaccination rates (%) against rubella



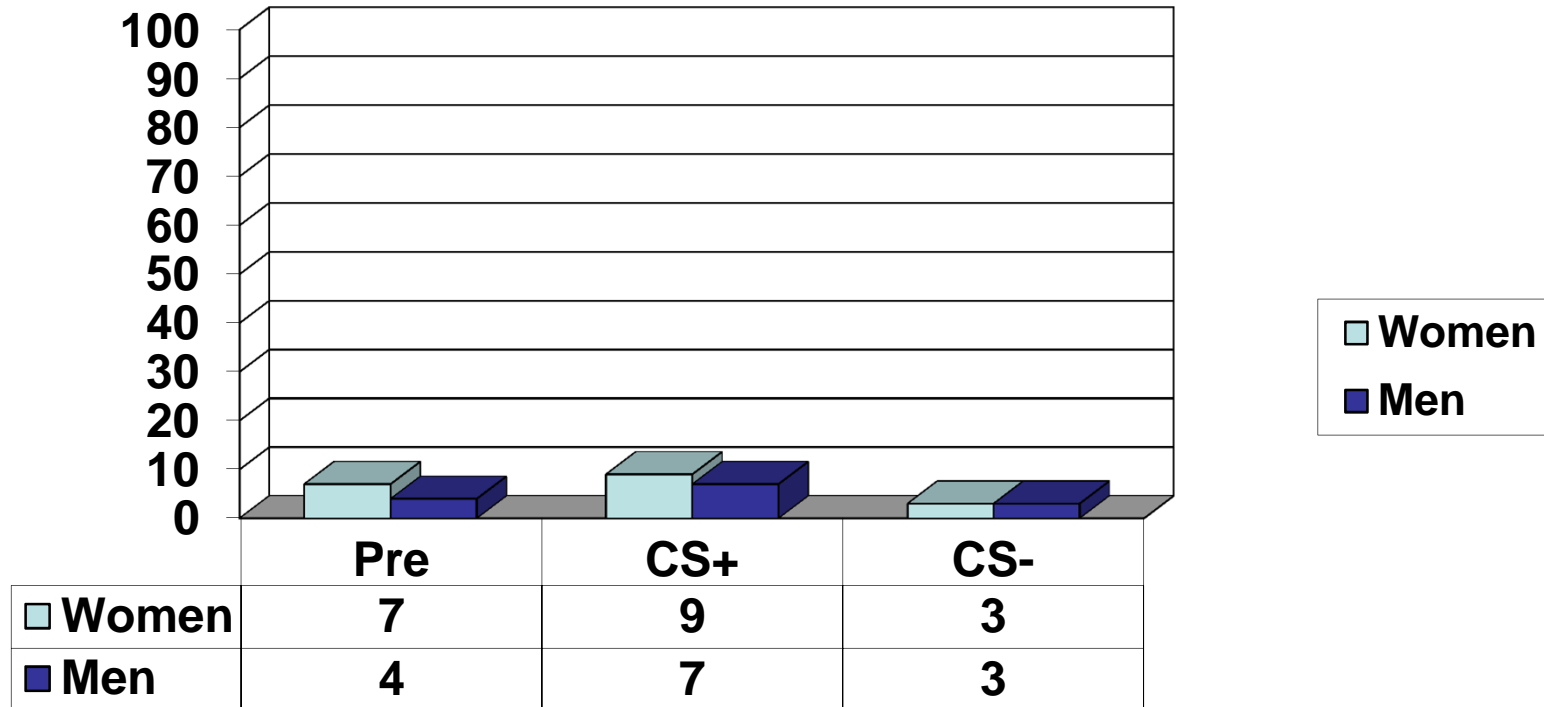
# Vaccination rates (%) against measles



# Vaccination rates (%) against mumps



# Vaccination rates (%) against pertussis



Meanwhile new recommendations in Germany!  
 “The next due Td vaccination as a single Tdap vaccination or, if indicated, a Tdap/IPV combination vaccination”

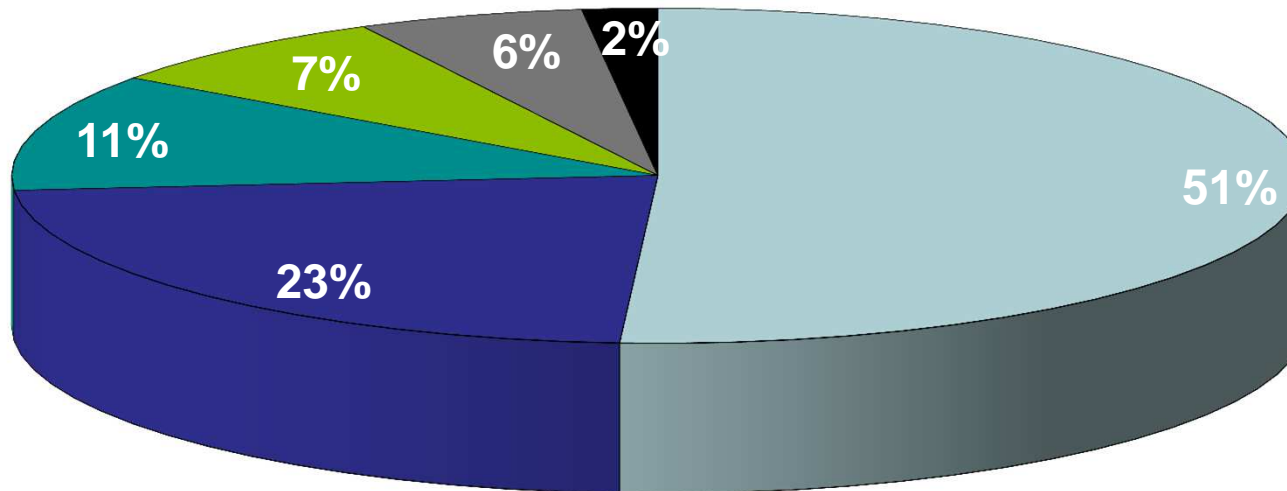
## Significant differences between CS+ and CS- groups

- Women:
  - hepatitis B
  - rubella
- Men:
  - hepatitis B
  - rubella
  
  - tetanus
  - diphtheria
  - polio
  - mumps

## Comparison concerning needle stick injuries (NSI)

	<b>CS+</b>	<b>CS-</b>
<b>Knowledge of our information sheet</b>	70,7%	27,5%
<b>Occurrence of a NSI</b>	23,2%	32,7%
<b>NSI, but „no actions have been taken“</b>	27,3%	27,8%
<b>NSI, and „contact with a medical doctor“</b>	63,7%	55,5%

## Occation of needle stick injuries in medical students





- Women mostly have better vaccination rates than men (concern for health might be greater in women).
- We were able to demonstrate that men can be motivated by a personal occupational health check.
- A clear offer of vaccination at an individualized occupational health check is an effective way to improve vaccination rates.
- One might speculate that the effect would have been much better if all vaccines had been offered free of charge at the occupational health check without additional consultation of the family doctor.

- Even for medical students at the end of their medical education, individualized advice is necessary for optimizing immunization against infectious diseases.
- Obviously, academic knowledge alone is not sufficient to modify behaviour!
- Occupational health checks are meaningful preventive measures.
- Routine occupational health checks in medical students (and supposedly in all health care workers) could make an important contribution to closing gaps in vaccination coverage.