

# Injury prevention and safety promotion in physical education in German schools

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## Objectives

In 2013 the public accident insurance in North Rhine-Westphalia registered nearly 280.000 accidents in 6.228 schools with 2,7 millions of pupils. About 100.000 of these occur in school sports and physical education (PE) accounting for ~35% of the annual total (Fig. 1). Despite a slight decrease in the accident rates over the last years, a clear need for action still can be stated.

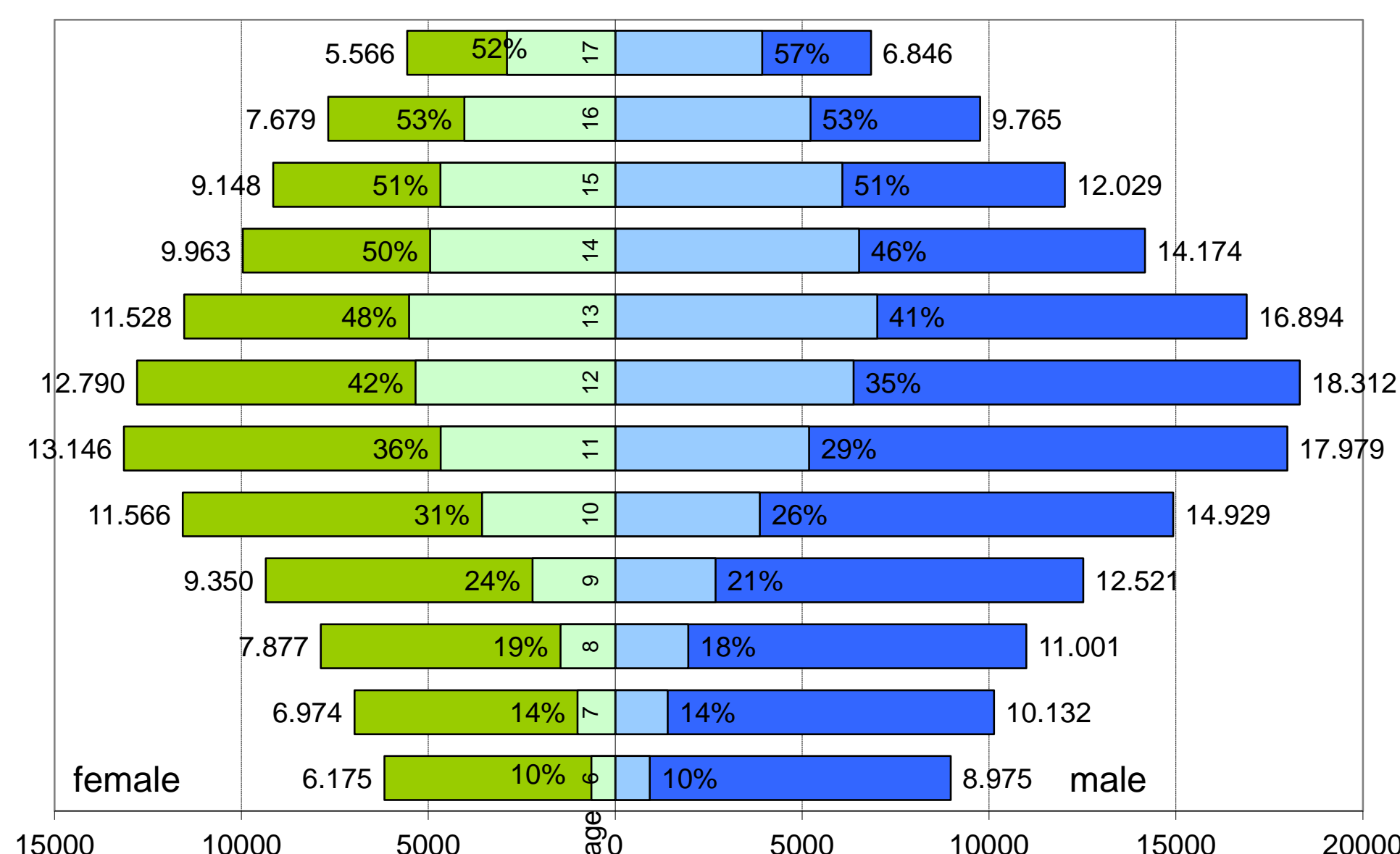
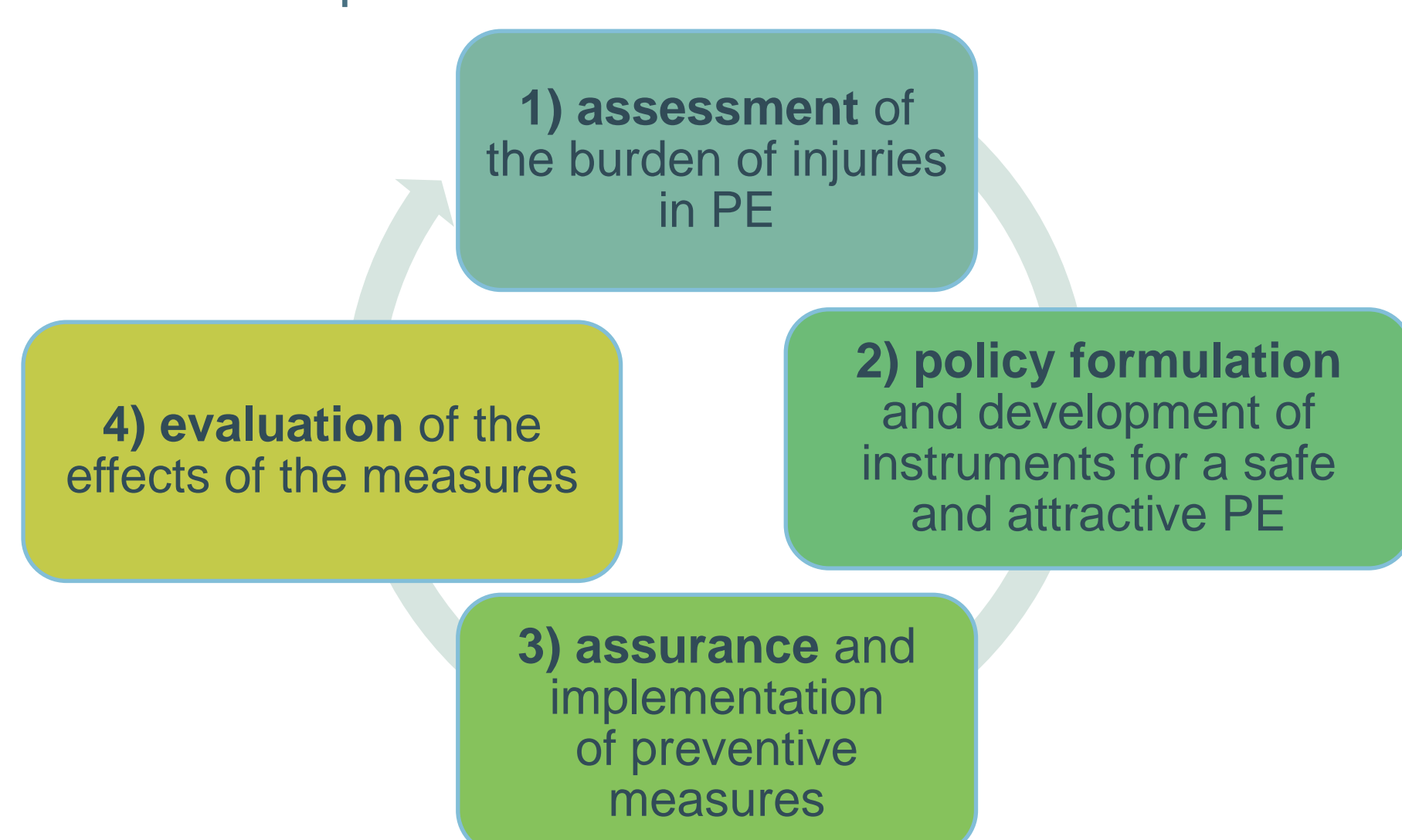


Figure 1: Number of injuries in schools in North Rhine-Westphalia in 2013 by age and gender [N=265.319] and the proportion of injuries in PE [N=92.136].

The founding of the research group 'Enhancing Safety in PE and School Sports' in 1995 based at University of Wuppertal's Department of Sports Sciences lead to several preliminary studies. On a local, regional and statewide basis, personal and situational as well as material and organizational risk factors were closely scrutinized.

Following the concept of the public health action cycle (Rosenbrock/Gerlinger, 2014) systematic approaches to identify and reduce the burden of sport related injuries in educational settings have been developed.



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## 1) Assessment

A representative sample of over 1.800 accidents in PE has been analysed on the basis of a timely questioning of injured pupils and their PE teachers.

The survey confirmed results of a study 10 years before that showed a significant impact of ball games on the injury rates, above all soccer and basketball (Fig. 2). Furthermore detailed knowledge about the circumstances and reasons for sport accidents could be provided, e.g. the fact that accidents usually occur during well known and easy movements in complex situations in ball games where there is not enough time respectively a lack of competence to react appropriately.

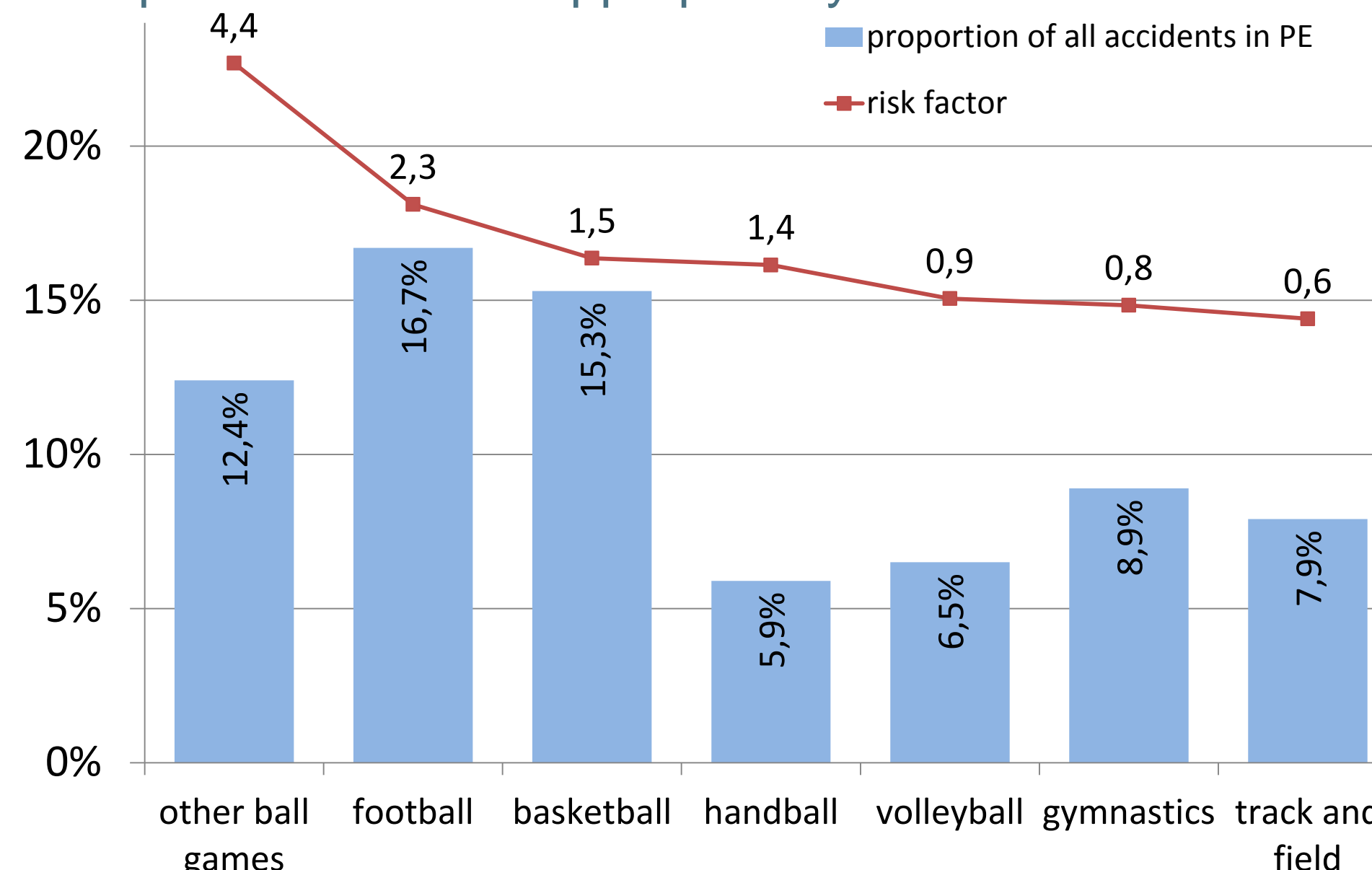


Figure 2: Percentage of injuries in the different sports and their risk factor (red line) in relation to the exposed time (N=1813).

On a institutional basis, striking differences in the accident rates can be determined between as well as within the various types of schools (Fig. 3). Especially within Germany's lower secondary and comprehensive schools annual accident rates can often be identified that exceed the rates of primary and higher (academic track) secondary schools more than double.

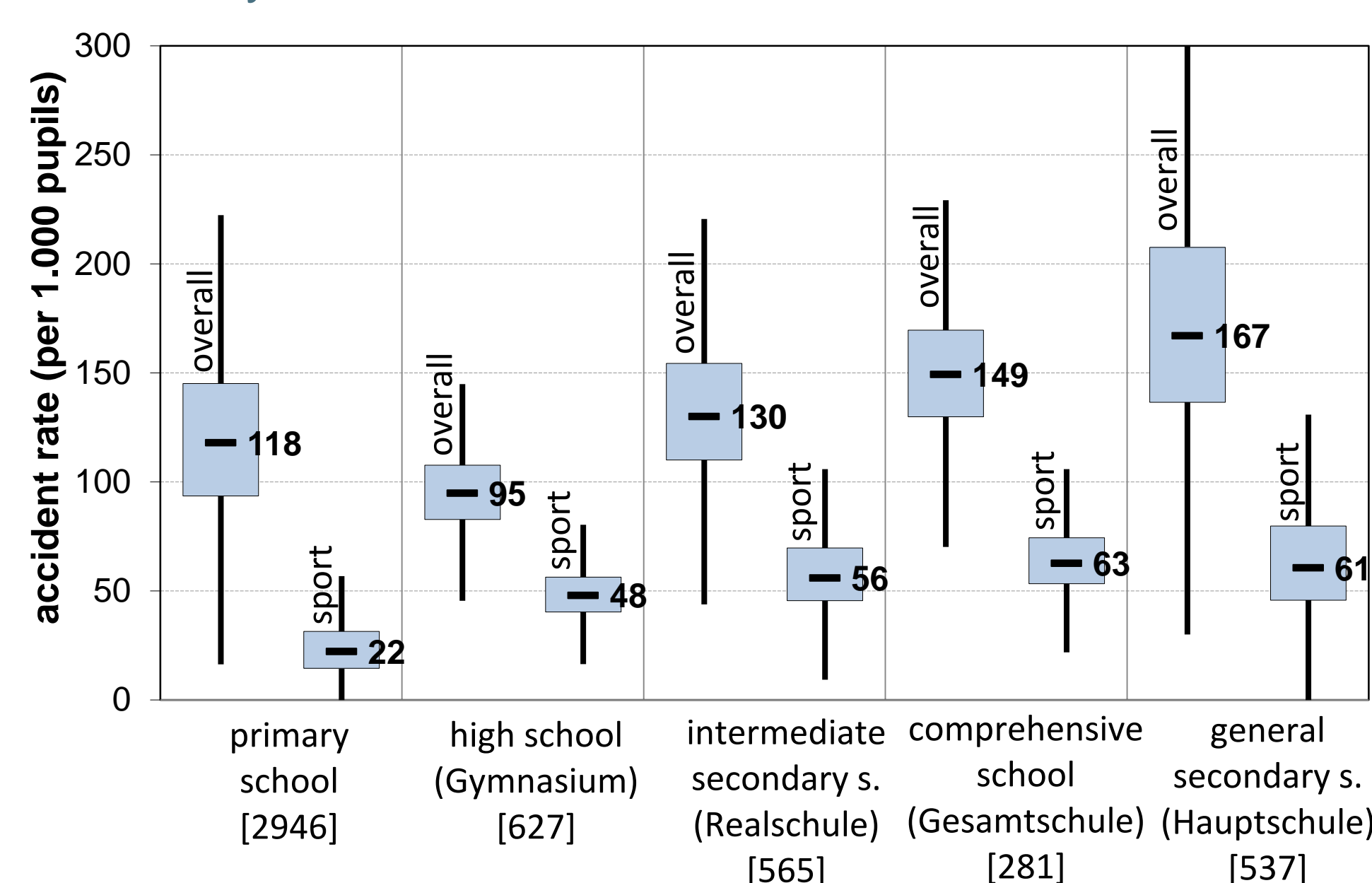


Figure 3: Boxplot (median, 25-, 75-percentile,  $\pm 1,5$  IQR) of the accident rates (overall and in PE) of 6228 schools in North Rhine-Westphalia in 2013. (i.e. half of all comprehensive schools have an overall injury rate above 149/1000.)

## 2) Policy formulation

Prevention instruments developed on the basis of the knowledge about PE injuries were made available to a selection of schools in order to test them and obtain further improvement. Among these there are

- manuals for a safe and attractive physical education that have been developed and disseminated in schools, e.g. for handball,
- a computer-aided tool for the self-assessment of sport related injuries in schools,
- detailed feedback of secondary modern schools on the accident occurrence by the public health insurance,
- a consistent support for schools with high accident rates and their school supervising authority to implement preventive measures.

## 3) Assurance

- Manuals for PE are well accepted by teachers when they provide direct assistance for their teaching preparation. Public accident insurances have therefore distributed such media extensively for many years and increasingly focused on the link between safety and quality of teaching as a key factor for successful implementation.
- Conversely the self assessment tool was introduced in a pre-study in 12 and later on in 86 schools with an offer of close support and several disseminators and stake holders in the educational setting.
- Overall only 40% of all school accidents with pupils needing medical treatment are documented by schools in North Rhine-Westphalia, the state with the highest population density in Germany. Therefore all secondary modern schools have been informed in detail about the accident rates of their school registered by the public accident insurance. This information can lead to a necessary debate within schools and initiate improvements to integrate new aspects in risk assessment.
- Schools with a high accident rate need to be directly addressed to initiate preventive action. The cooperation with other affected schools and supervising authority on a municipal level has turned out to be useful.

## 4) Evaluation

The various instruments have been evaluated by several questionings and interviews. The results show that schools need external impulses and support to prevent injuries adequately. However the attendance of headmasters and PE teachers for this issue is a prerequisite. Material, organisational and methodological improvements have been initiated as an effect of the debate within schools. Nevertheless the willingness to systematically implement safety promotion into the school development cannot be determined extensively (Fig. 4).

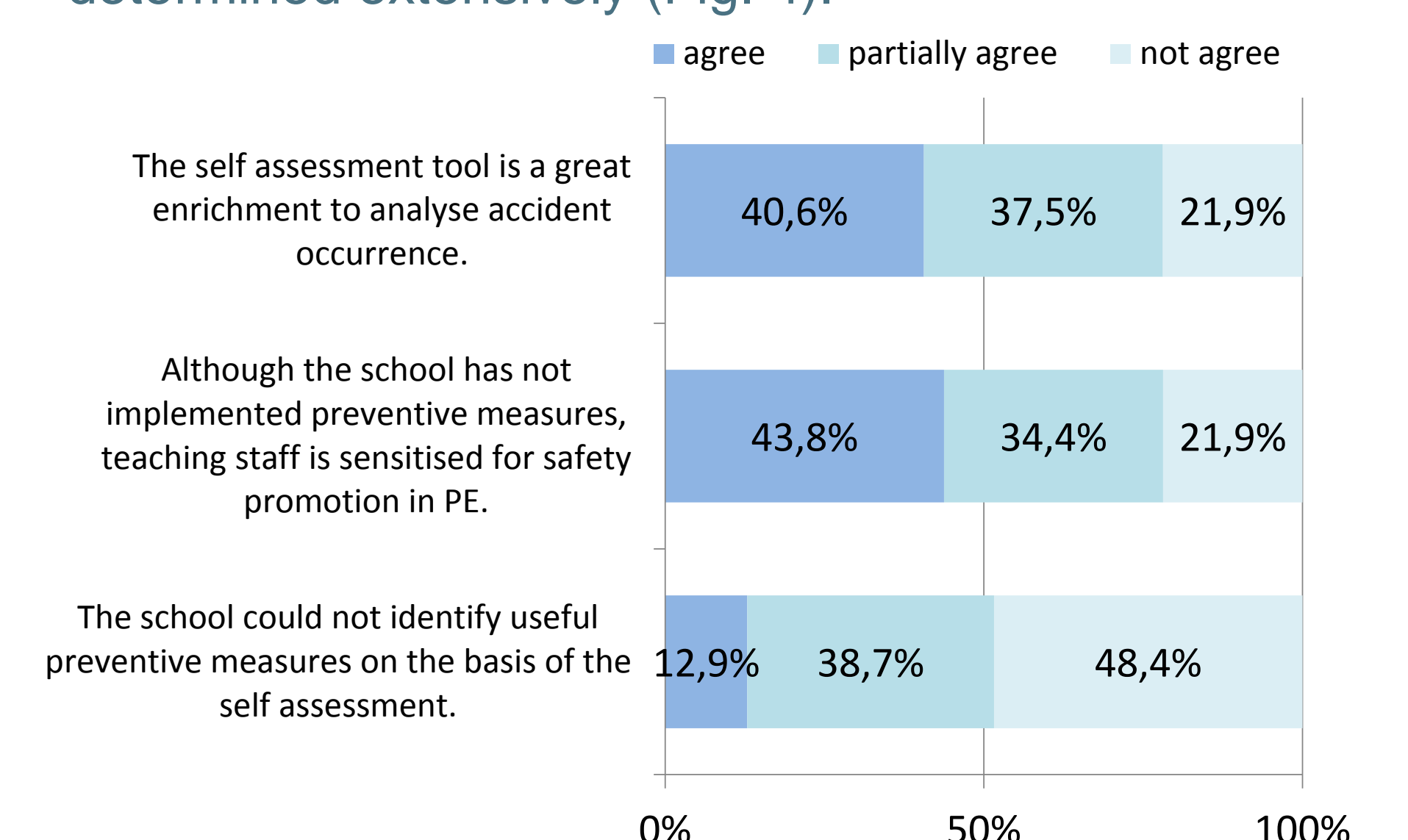


Figure 4: Answers to the question of usability of the self assessment tool. (N=32 schools out of 57 that took part in the evaluation).

## Conclusion

Injury prevention in physical education has to consider the local needs and circumstances in each school. It therefore has to take into account the founded information about general risks in sports as well as the manifestation of the problem in the individual school. Prevention resources can be developed when research and practical implementation systematically are connected.