In Germany and worldwide, annual influenza epidemics often cause a large number of lost working hours, severe infections and also fatalities (RKI 2010a, 2011). Seasonal influenza is caused by influenza viruses. The influenza season usually begins in January or February and lasts for about eight to ten weeks. Annual immunization against the influenza virus strains that are currently circulating is an effective, inexpensive and safe method of protection against infection. To reduce the number of severe and fatal infections caused by influenza, the Standing Committee on Vaccination (STIKO) recommends seasonal influenza vaccinations for people aged 60 and over and for specific risk groups. These include people with underlying chronic diseases, people in old people’s or nursing homes, people with a high occupational risk (e.g. health care workers) and pregnant women (RKI 2010b). Health care workers are one of the target groups because due to their contact to infected patients they can transmit an influenza infection.

Unlike several other European countries, Germany does not have a central vaccination register. Up to now, telephone surveys, health insurance data and household surveys (e.g. the 2003 microcensus) have been primarily used to determine rates of vaccination coverage (Blank et al 2009; Blank et al 2008; Wiese-Posselt 2006; Reuss et al 2010; Rehmet et al 2002; Statistisches Bundesamt 2004). The data show that influenza vaccination rates have been stagnating since 2005/06 following a slight rise at the beginning of the millennium; indeed, even a slight decline in vaccination coverage can be observed among the target groups in Germany (Blank et al 2009).

A systematic monitoring of vaccination coverage is necessary to measure the success of annual immunization campaigns (BZgA 2011) and, where necessary, to optimize these campaigns. The telephone health survey »German Health Update« (GEDA) conducted by the Robert Koch Institute’s Department of Epidemiology and Health Reporting (www.rki.de/geda), makes it possible to continuously measure vaccination coverage both in the general population and in target groups. The results are representative of the resident, adult, German-speaking population. A particular advantage of the GEDA study compared to other telephone surveys on influenza vaccination (e.g. Blank et al 2009; Blank et al 2008; Wiese-Posselt 2006) is the high sample size of approximately 21,000 respondents. This allows a detailed evaluation of influenza vaccination data according to target group, and an analysis of the correlations between influenza vaccine uptake and socio-demographic and socio-economic factors. Furthermore, the GEDA study can be seen in the context of the Robert Koch Institute’s previous representative health surveys (GSTel03 – GSTel07, RKI 2008), which allow the analysis of the development of vaccination coverage in Germany over

Key messages
▶ The vaccination coverage of the general population was 31% in the 2007/08 influenza season.
▶ 57% of people aged 60 and over were vaccinated in 2007/08.
▶ The vaccination coverage of chronically ill persons was particularly low among younger people.
▶ The vaccination coverage of health care workers was lower than that of the general population.

Influenza Virus Vaccination in Germany – Results of the »German Health Update« study (GEDA) 2009

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time. The analyses of influenza vaccination presented below are based on data from the 2009 GEDA study (RKI 2010c). More detailed information on the study and analyses regarding influenza vaccination have been published recently (Böhmer et al. 2011). Between July 2008 to March 2009 the participants were asked whether they had received an influenza vaccination in the previous winter season 2007/08. The following data therefore relate to vaccination coverage in the 2007/08 influenza season.

**Immunization coverage increases with age**

The data of the 2009 GEDA study show that about one in three adults (31%) were vaccinated against seasonal influenza in the 2007/08 influenza season. Overall, women tended to be vaccinated more often than men in the 2007/08 season (32% vs. 30%) (cf. Böhmer et al. 2011).

A comparison of the vaccination rates of seven different age groups shows that coverage increases with age (Figure 1). The higher vaccination coverage is particularly marked among people aged 60 and over, i.e. in people for whom vaccination is officially recommended by STIKO. Hence, just over half of the people (57%) aged 60 and over, and nearly two-thirds (65%) of people aged 70 and over, had an influenza vaccination in the 2007/08 season (cf. Böhmer et al. 2011).

**Figure 1**

Percentage of women and men who received a flu vaccination in the 2007/2008 season, by age

Data basis: GEDA 2009

![Bar chart showing percentage of women and men vaccinated by age group.]

**Higher vaccination rates in East Germany**

Nearly twenty years after the reunification of East and West Germany there are still significant differences between the two regions when it comes to the population’s acceptance of influenza vaccination (RKI 2009). The vaccination rate in the general population in the 2007/08 season averaged 43% in the east of the country (including Berlin) compared to 28% in the west (cf. Böhmer et al. 2011). After adjusting for age, this means that people living in eastern Germany were twice as likely to be vaccinated against the influenza (OR = 2.1, 95% CI = 1.9 to 2.3). Among the aged 60+ age group the highest vaccination coverage was reached in Brandenburg (77%), the lowest was in Rhineland-Palatinate (39%) (Figure 2).

The data show that there was an east-west difference both among the 60+ age group and among the under-sixties. The younger people in eastern Germany were twice as likely to be vaccinated than their peers in the west (OR = 2.0, 95% CI = 1.8 to 2.2); among the 60+ age group that ratio was 2.3:1 (OR = 2.3, 95% CI = 2.0 to 2.7). The higher vaccination coverage of women and men in eastern Germany seems to reflect a greater acceptance of vaccinations in general in the adult population in these regions (RKI 2009).

**The WHO’s target among older people not yet reached**

Since older people have a greater risk of serious, sometimes fatal influenza infection, it is recommended in Germany that people aged 60 and over should have an annual influenza vaccination. The WHO’s target of a 75% influenza vaccination coverage among older people by 2010 (WHO 2005) has not yet been reached; the vaccination rate in 2007/08 was 57% (Table 1, Böhmer et al. 2011).

Only among people aged 60 and over in the former East Germany – where the vaccination rate was just over 70% – immunization against influenza came close to the WHO target. Overall, people with an age-related indication to vaccinate had the highest vaccination coverage among the target groups studied. Among other things, this might be associated with a tendency among the older age group to make more use of the healthcare system (Bergmann et
of an influenza infection. The comprehensive collection of data on the health of the people interviewed in the 2009 GEDA study made it possible to conduct an evaluation specifically of the target group of the chronically ill. Based on the examples of underlying chronic diseases cited in the STIKO recommendations (RKI 2010b), in this study people were classified as chronically ill if they indicated in the survey that they were suffering from chronic cardio-vascular diseases, liver or kidney diseases, respiratory or metabolic diseases, or cancer.

44% of the chronically ill received an influenza vaccination in the 2007/08 season (Table 1, Böhmer et al. 2011). Women were slightly more frequently vaccinated than men. While only 18% of the 18- to 29-year-old chronically ill people were vaccinated, the proportion of people vaccinated among the chronically ill was 63% among those with an additional age indication (≥60 years). This suggests that the recommendation to have an influenza vaccination is being inadequately implemented among younger patients with an underlying chronic disease.

Particularly low level of vaccination coverage among health care workers

Among the people interviewed for the 2007/08 season were 768 people working in the healthcare sector. This group includes, for example, physicians (including dentists), doctors’ receptionists, nurses and physiotherapists. Medical staff made up 4.7% of the GEDA study’s total sample, corresponding roughly to their percentage of the adult German population (Statistisches Bundesamt 2010). The vaccination coverage of medical staff was 22% (Table 1, Böhmer et al. 2011). It was striking here that, unlike older people and the chronically ill, men were more frequently vaccinated than women (Table 1, Böhmer et al. 2011). The vaccination rate of physicians was approx. 29%, i.e. higher than nurses, whose coverage was about 22% (Böhmer et al. 2011). Overall, not only was vaccination coverage among health care workers by far the lowest of the three target groups studied, it was significantly lower than that of the general population.
example, existing education campaigns for medical staff (e.g. as part of the German vaccination campaign called »Wir kommen der Grippe zuvor«, BZgA 2011) could be intensified. Studies show that being advised by doctors to get vaccinated against influenza is the most effective motivation for people (Wiese-Posselt et al. 2006).

To create a basis for the efficient planning of measures, it is essential to evaluate the success of such campaigns on an annual basis using a suitable method. Representative telephone surveys like the GEDA study can be used for this purpose. They provide valuable, readily available data on the vaccination status of adults and also make it possible to link vaccination data with socio-demographic characteristics for more in-depth analyses. Information can be deduced from this about possible barriers to high vaccination rates and possible starting points for targeted interventions.

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Other useful links:

For a wide range of information on the subject of vaccination, see Federal Centre for Health Education (BZgA):
http://www.impfen-info.de (german version only)

Robert Koch Institute’s answers to FAQs on seasonal influenza vaccination at:

Influenza Working Group:
http://www.influenza.rki.de (german version only)
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