



#### 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

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](http://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 (GSTelo3 – GSTelo7, RKI 2008), which allow the analysis of the development of vaccination coverage in Germany over

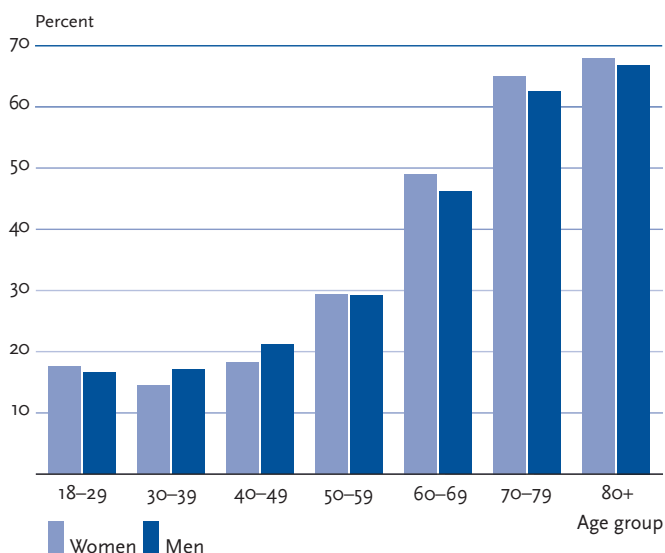
time. The analyses of influenza vaccination presented below are based on data from the 2009 GEDA study (RKI 2010c). More detailed information on the study and analyses regarding influenza vaccination have been published recently (Böhmer et al. 2011). Between July 2008 to March 2009 the participants were 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



### 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

### German Health Update (GEDA)

<b>Data holder:</b>	Robert Koch Institute
<b>Objectives:</b>	To provide up-to-date data on health-related issues, to analyse temporal developments and trends
<b>Survey method:</b>	Computer-assisted telephone interviews (CATI)
<b>Population:</b>	Residential population of Germany aged 18 and over
<b>Sample:</b>	21.262 women und men
<b>Cooperation rate:</b>	51,2%
<b>Survey period:</b>	July 2008 to June 2009
<b>Influenza vaccination coverage:</b>	In total, information provided by 15,552 people who were questioned from the beginning of the study to 31 March 2009 was evaluated to determine the vaccination coverage for the 2007/08 influenza season

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

**Figure 2**  
**Vaccination coverage among people aged 60 and over in the 2007/2008 season, by state**  
 Data basis: GEDA 2009



al. 2005). More women tended to be vaccinated than men (59 % vs. 54 %) among the 60+ age group (cf. Böhmer et al. 2011).

### Vaccination recommendation for the chronically ill is not getting through to the younger age groups

Having certain underlying chronic diseases is an indication for an influenza vaccination. People with certain underlying diseases are especially at risk of a severe course

**Table 1**  
**Proportion of women and men who had a flu vaccination in the 2007/2008 season, by target group (percentage, 95% confidence intervals)**  
 Data basis: GEDA 2009

	People aged ≥60 years	Chronically ill people	Medical personnel
	% (95%-CI)	% (95%-CI)	% (95%-CI)
<b>Women</b>	58.5 (55.6–61.3)	44.5 (42.0–47.0)	21.1 (18.1–24.4)
<b>Men</b>	54.3 (51.0–57.5)	43.0 (40.2–45.9)	24.6 (17.7–33.1)
<b>Total</b>	56.6 (54.5–58.8)	43.8 (41.9–45.7)	21.9 (19.0–25.1)

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 cardiovascular 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 among medical staff (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.

### Discussion

An annual vaccination is the most important preventive measure offering protection against influenza. This analysis of the 2009 GEDA study shows that influenza immunization is still too low in Germany, despite annual vaccination campaigns among the recommended target groups. Only just over two in five persons (44 %) belonging to at least one of the target groups recommended by STIKO were vaccinated against seasonal influenza in the studied 2007/08 season. The level of vaccination coverage increased with age, but still did not reach the target of 75 % among people aged 60 and over. There is a marked need to increase vaccination coverage, particularly among

medical personnel and people who, regardless of age, have a particularly high risk of a severe course of an infection because of a pre-existing underlying disease.

Vaccination coverage has been stagnating in Germany in recent years; in the target groups it has even declined slightly (Blank et al. 2009). The development of influenza vaccination rates over recent years shows that in some cases they have been greatly influenced by external factors, e. g. the discussions on avian influenza (H5N1 virus) or the so-called swine influenza (the pandemic H1N1 virus in 2009). For example, the observed high vaccination coverage of the general population in the 2005/06 season (33 %) was probably due to intense media reporting on avian influenza in 2005 (Blank et al. 2008).

Particularly low vaccination rates were observed in the 2009 GEDA study among health care workers. These results are consistent with other studies, which have also reported a low influenza immunization coverage of this target group. In a study comparing influenza vaccination coverage in the five most populous EU countries, medical staff in Germany were found to have a vaccination rate of 17 % in the 2007/08 season (Blank et al. 2009). Efforts should be made to increase vaccine uptake in this target group, because people who work in the medical field are more vulnerable to being infected with the virus themselves because of their contact with influenza patients. Moreover, medical staff can be an infection risk for the unvaccinated, perhaps especially vulnerable patient groups they look after. In addition, medical staff have a key role to play when it comes to reminding people of the annual influenza vaccination, explaining the benefits and risks of vaccination, and in this way helping patients to make a decision on this issue.

As in previous studies (e. g. Wiese-Posselt et al. 2006; Rehmet et al. 2002) significantly higher influenza vaccination rates were also observed in the 2009 GEDA study among people living in East Germany. The differences between east and west are found both in the 60+ age group and among younger people. The significantly higher level of acceptance of influenza vaccination in the east of the country can perhaps be seen as an after-effect of the state-organized system of vaccination prevention in the GDR, where influenza vaccination was recommended for people with an increased health risk or a higher risk of exposure, and for the working population. The aim was the complete vaccination of these groups (RKI 2009; Dittmann, Thilo 1986).

In order to increase influenza vaccination coverage in Germany, it is necessary to launch new target-group-oriented vaccination campaigns, or to intensify existing campaigns. Such campaigns depend on the population receiving continuous and reliable information on influenza and the vaccination against it. An especially promising approach towards vaccination coverage is to sensitize healthcare professionals as key multipliers for the subject of influenza vaccination (Wortberg et al. 2009). For

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.

*Merle Böhmer, Dietmar Walter*

Robert Koch Institute

Immunization Division

Department for Infectious Disease Epidemiology

with the collaboration of the

Health Monitoring/Surveys Division,

Department of Epidemiology and Health Reporting

#### **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:

[http://www.rki.de/DE/Content/Infekt/Impfen/FAQ/InfluenzaSaisonalPandemisch/faq\\_\\_tab.html](http://www.rki.de/DE/Content/Infekt/Impfen/FAQ/InfluenzaSaisonalPandemisch/faq__tab.html) (last revised: 02.12.2010) (german version only)

Influenza Working Group:

<http://www.influenza.rki.de> (german version only)

## Bibliography

- Bergmann E, Kalcklösch M, Tiemann F (2005) Inanspruchnahme des Gesundheitswesens: Erste Ergebnisse des telefonischen Gesundheitssurveys 2003. Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 48(12): 1365–1373
- Blank PR, Schwenkglens M, Szucs TD (2009) Disparities in influenza vaccination coverage rates by target group in five European countries: trends over seven consecutive seasons. Infection 37(5):390–400
- Blank PR, Freiburghaus AU, Ruf BR et al. (2008) Trends in influenza vaccination coverage rates in Germany over six seasons from 2001/02 to 2006/07. Med Klin 103(11): 761–768
- Böhmer MM, Walter D, Müters S, Krause G, Wichmann O (2011) Seasonal influenza vaccine uptake in Germany 2007/08 and 2008/09: Results from a national health update survey. Vaccine 29:4492–4498.
- Bundeszentrale für gesundheitliche Aufklärung (BZgA) Impfkampagne »Wir kommen der Grippe zuvor«. BZgA, Köln
- Dittmann S, Thilo W (1986) Vademekum für Impfähzte. Gustav Fischer Verlag, Jena
- Rehmet S, Ammon A, Pfaff G et al. (2002) Cross-sectional study on influenza vaccination, Germany, 1999–2000. Emerg Infect Dis 8(12): 1442–1447
- Reuss AM, Walter D, Feig M et al. (2010) Influenzaimpfquoten der Saisons 2004/05, 2005/06 und 2006/07: Eine Sekundärdatenanalyse von Abrechnungsdaten der Kassenärztlichen Vereinigungen. Deutsches Ärzteblatt 107(48): 845–850  
<http://www.aerzteblatt.de> (Stand: 19.01.2011)
- Robert Koch-Institut (2008) Bisherige Telefonsurveys am RKI (GSTelo3-07). RKI, Berlin  
<http://www.rki.de> (Stand: 19.01.2011)
- Robert Koch-Institut (Hrsg) (2009) Impfen. In: 20 Jahre nach dem Fall der Mauer: Wie hat sich die Gesundheit in Deutschland entwickelt? Beiträge zur Gesundheitsberichterstattung des Bundes. RKI, Berlin, S 169–175  
<http://www.rki.de> (Stand: 19.01.2011)
- Robert Koch-Institut (Hrsg) (2010a) Bericht zur Epidemiologie der Influenza in Deutschland Saison 2009/10. RKI, Berlin  
<http://influenza.rki.de/Saisonberichte> (Stand: 19.01.2011)
- Robert Koch-Institut (Hrsg) (2010b) Empfehlungen der Ständigen Impfkommission (STIKO) am Robert Koch-Institut/Stand: Juli 2010. Epidemiologisches Bulletin 30: 279–298  
<http://www.rki.de> (Stand: 19.01.2011)
- Robert Koch-Institut (Hrsg) (2010c) Daten und Fakten: Ergebnisse der Studie »Gesundheit in Deutschland aktuell 2009«. Beiträge zur Gesundheitsberichterstattung des Bundes. RKI, Berlin  
<http://www.rki.de> (Stand: 19.01.2011)
- Robert Koch-Institut (Hrsg) (2011) RKI-Ratgeber Influenza. RKI, Berlin  
<http://www.rki.de> (Stand: 10.01.2011)
- Statistisches Bundesamt (2004) Fragen zur Gesundheit. Mikrozensus 2003–Gripeschutzimpfung seit Ende April 2002. Statistisches Bundesamt, Wiesbaden  
<http://www-ec.destatis.de> (Stand: 19.01.2011)
- Statistisches Bundesamt (2010) Gesundheitspersonal nach Berufen. Statistisches Bundesamt, Wiesbaden  
<http://www.destatis.de> (Stand: 19.01.2011)
- Wiese-Posselt M, Leitmeyer K, Hamouda O et al. (2006) Influenza vaccination coverage in adults belonging to defined target groups, Germany, 2003/2004. Vaccine 24(14): 2560–2566
- World Health Organization (2005) Influenza vaccines – WHO position paper. Weekly Epidemiological Record 33: 279–287  
<http://who.int> (Stand: 19.01.2011)
- Wortberg S, Walter D, Knesebeck M et al. (2009) Niedergelassene Ärzte als Multiplikatoren der Influenzaimpfung bei älteren Menschen, chronisch Kranken und medizinischem Personal. Ergebnisse einer bundesweiten Repräsentativbefragung im Rahmen der nationalen Influenza-Impfkampagne. Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 52(10): 945–52



GBE kompakt

**Published by**

Robert Koch Institute  
Nordufer 20  
13353 Berlin

**Editorial staff**

Dr. Christine Hagen, Dr. Livia Ryl  
Robert Koch Institute  
Department of Epidemiology and Health Reporting  
General-Pape-Straße 62  
12101 Berlin  
Tel.: 030-18 754-3400  
Email: [gbe@rki.de](mailto:gbe@rki.de)  
[www.rki.de/gbe](http://www.rki.de/gbe)

**How to quote the title**

Böhmer M, Walter D (2011)  
Influenza Virus Vaccination in Germany:  
Results of the 2009 GEDA Telephone Health Survey.  
Published by Robert Koch Institute Berlin  
GBE kompakt 2(1)  
[www.rki.de/gbe-kompakt](http://www.rki.de/gbe-kompakt) (last revised: 27.07.2011)

ISSN 2191-4974

The Robert Koch Institute is a federal institute  
within the portfolio of the Federal Ministry of Health