

Do older patients take more drugs and are they at higher risk of adverse drug reactions? What do spontaneous reports tell us?



Thomas Stammschulte¹, Henry Pacht¹, Ursula Gundert-Remy¹

¹Drug Commission of the German Medical Association, Berlin, Germany; www.akdae.de

thomas.stammschulte@akdae.de

Background

According to the 2011 German Report on Drug Prescriptions (Arzneiverordnungs-Report), drug usage in statutory health insurance increases with age: from 66 defined daily doses (DDD) per insured person between the ages of 20 to 24, to up to 1,521 DDDs for the age group 85 to 89 years (Figure 1)^[1]. The risk of adverse drug reactions (ADR) depends on the characteristics of the drugs administered, the number of drugs administered to one patient, the age of the patient, and concomitant diseases^[2–5]. Thus, the ADR risk should be reflected in the number of spontaneous reports for different patient age groups.

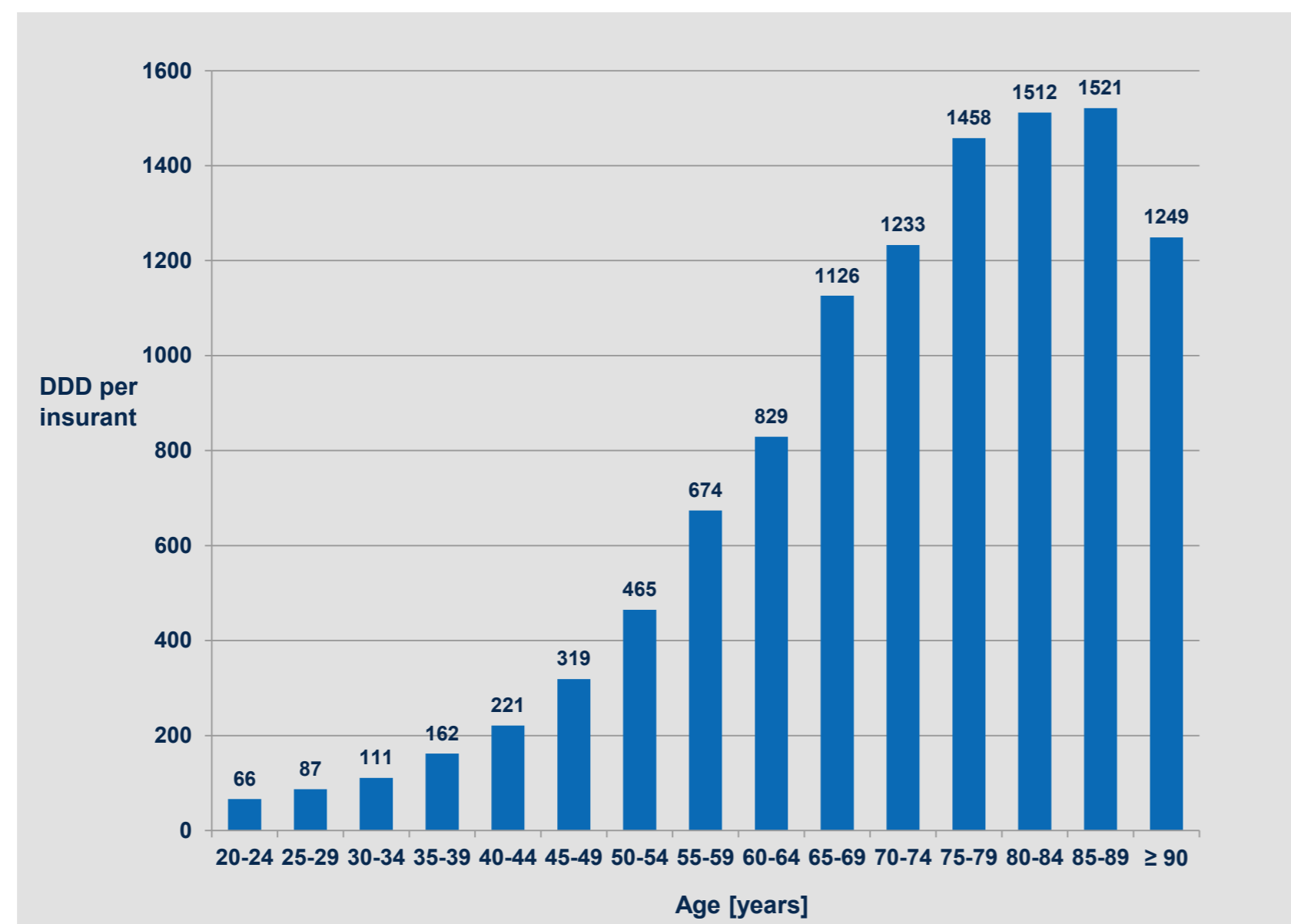


Figure 1:

Drug usage per insurant in German statutory health insurance 2010 related to different age groups in defined daily doses (DDD)^[1]

Objective and Methods

We analysed the association of drug usage with the number of spontaneous reports in different age groups of patients (≥ 20 years of age) based on the data from the German Report on Drug Prescriptions (2006 to 2010) and the data found in the German spontaneous reporting database. We performed the analysis for the whole spectrum of small molecule drugs and give specific examples:

(1) antibiotics (Anatomical Therapeutic Chemical (ATC) Classification System J01), (2) antithrombotic agents (ATC B01) and (3) psycholeptics (ATC N05: anti-psychootics, anxiolytics, hypnotics and sedatives).

Results

84,905 spontaneous ADR reports were available for the period 2006 to 2010. Reports without information about the age of the patient (n = 24,380) were excluded. Hence, 60,525 reports were included in the analysis.

The rate of spontaneous ADR reports was 586 reports per 1 million insured persons between the ages of 20–24 years, and increased up to 1,630 reports per 1 million in the 75–79 age group (Figure 2). In the ≥ 85 age group, the reporting rate decreased to 1,184 reports for patients older than 90 years. Taking into account the drug usage in the different age groups, the reporting rate was 0.19 reports per million DDD prescribed for patients aged 85–89 years, and 1.96 reports for 20–24 year olds (Figure 3).

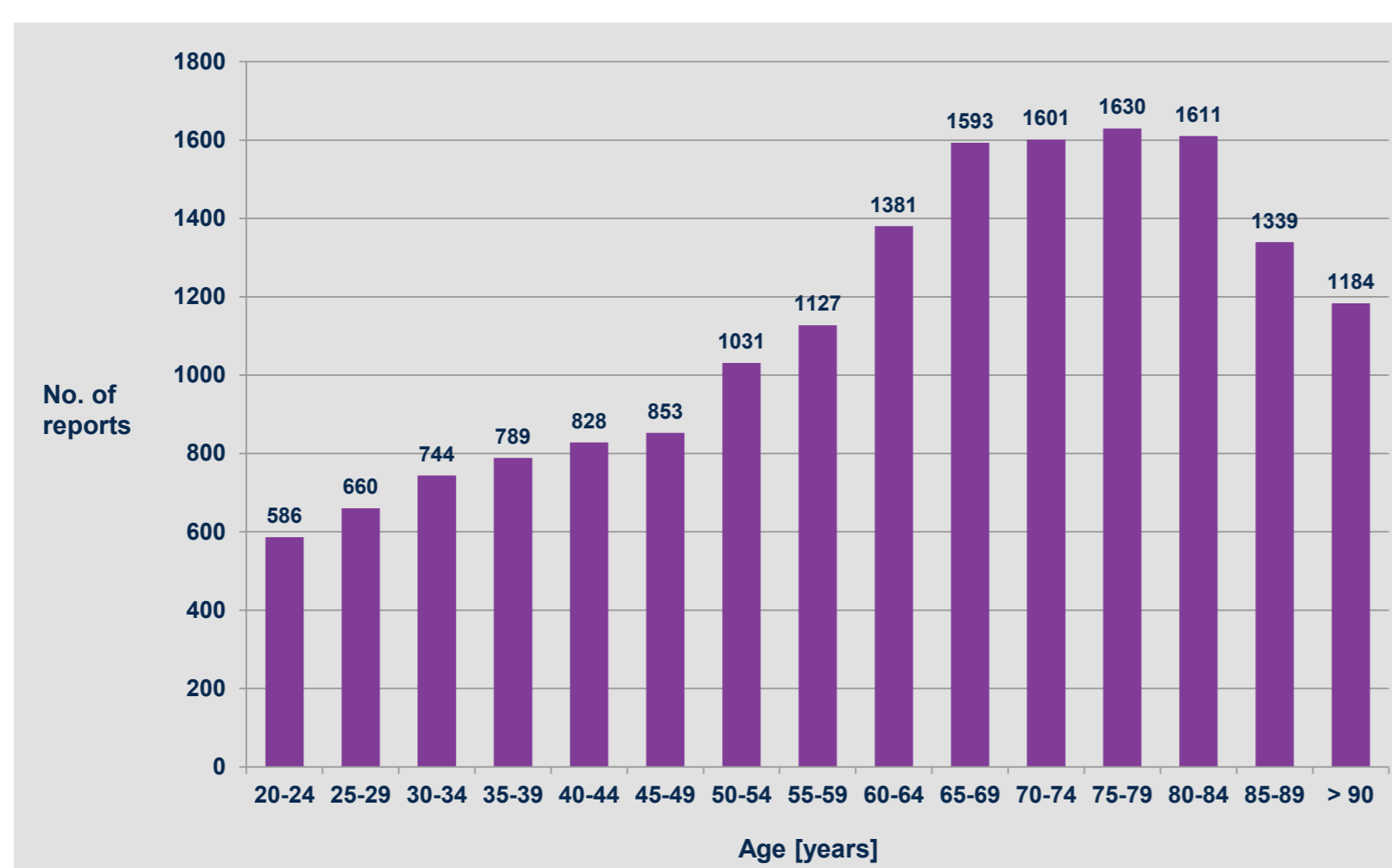


Figure 2:

Number of spontaneous reports 2006–2010 per million insurants in relation to different age groups

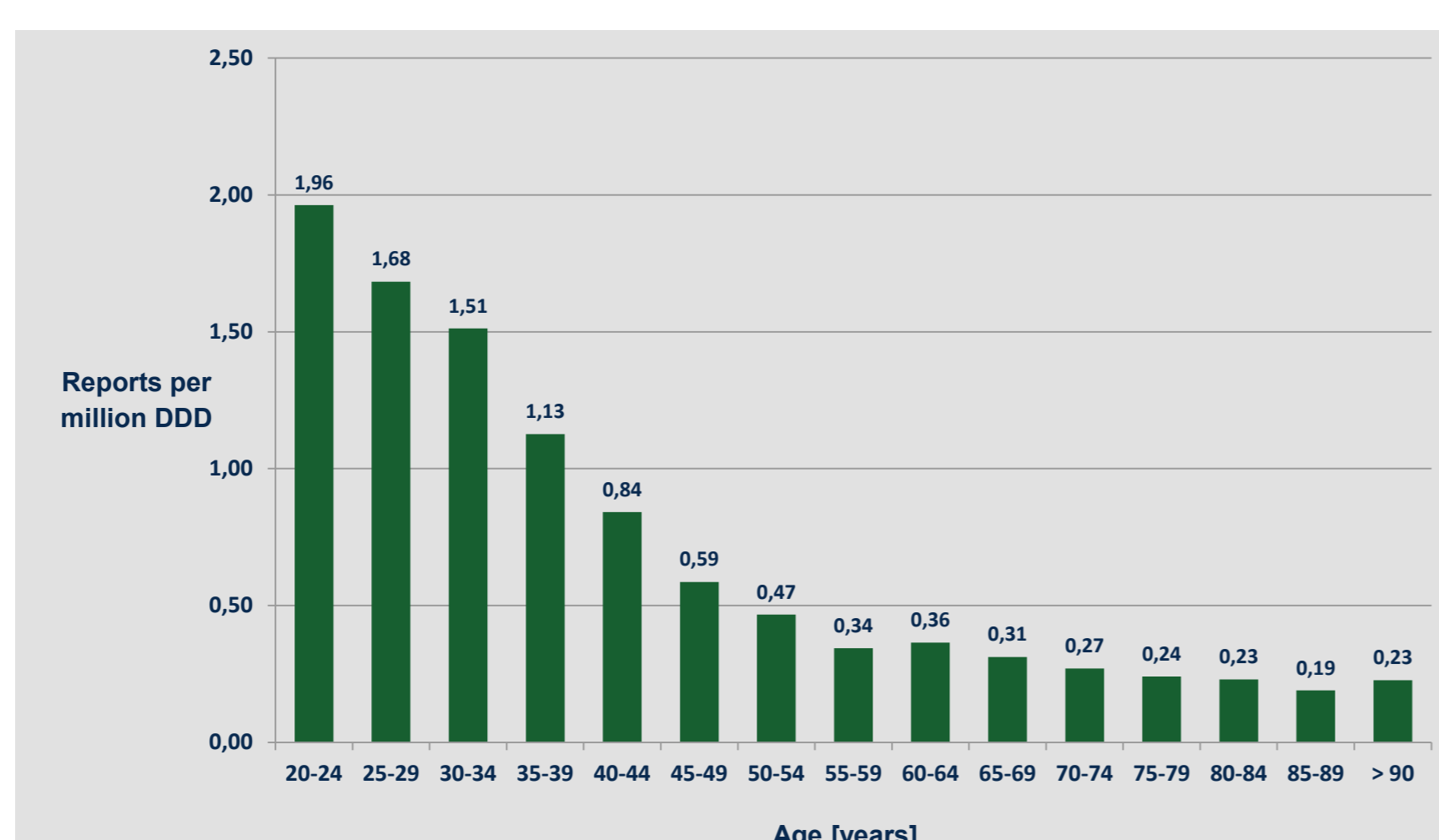


Figure 3:

Rate of spontaneous reports per million prescribed defined daily doses in relation to different age groups

The results of the analyses of antibiotics, antithrombotic agents and psycholeptics are shown in Figures 4 to 9.

Example 1: Antibiotics

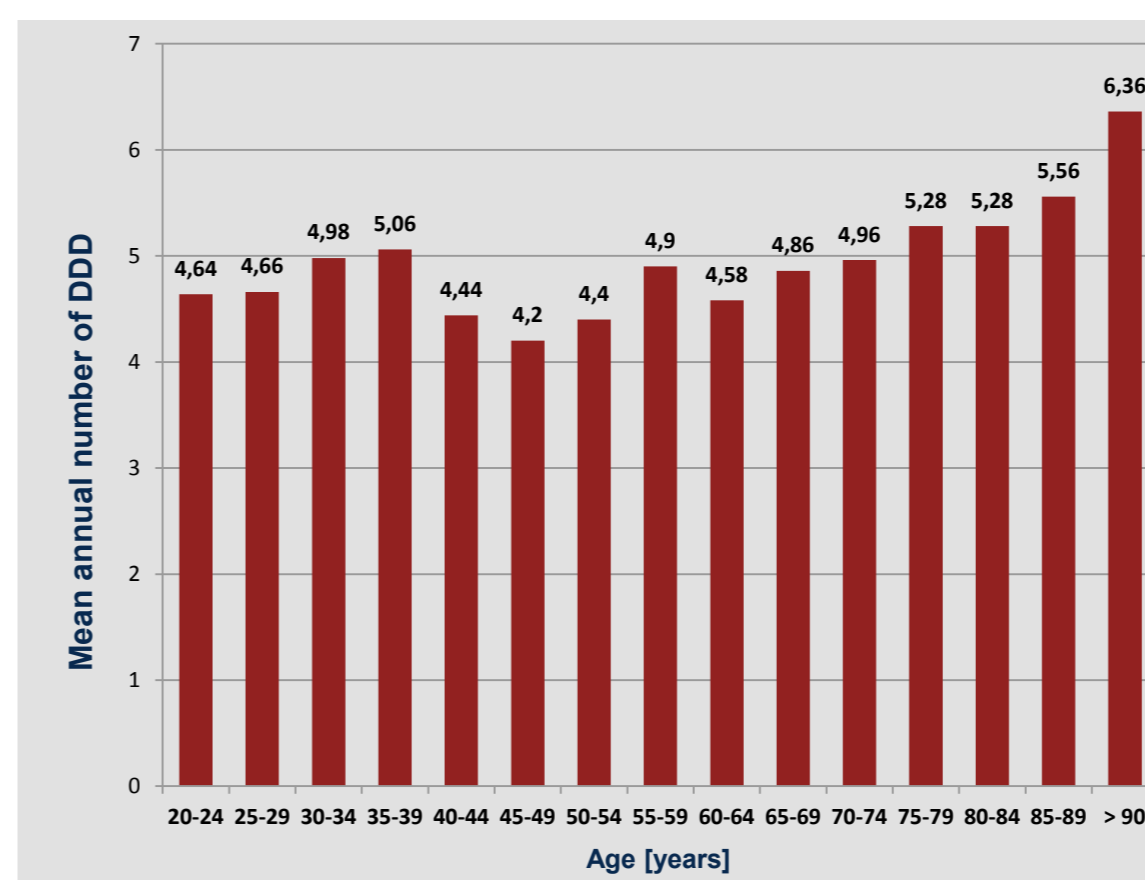


Figure 4: Mean annual number (2006–2010) of prescribed defined daily doses (DDD) of antibiotics (ATC J01) per insurant

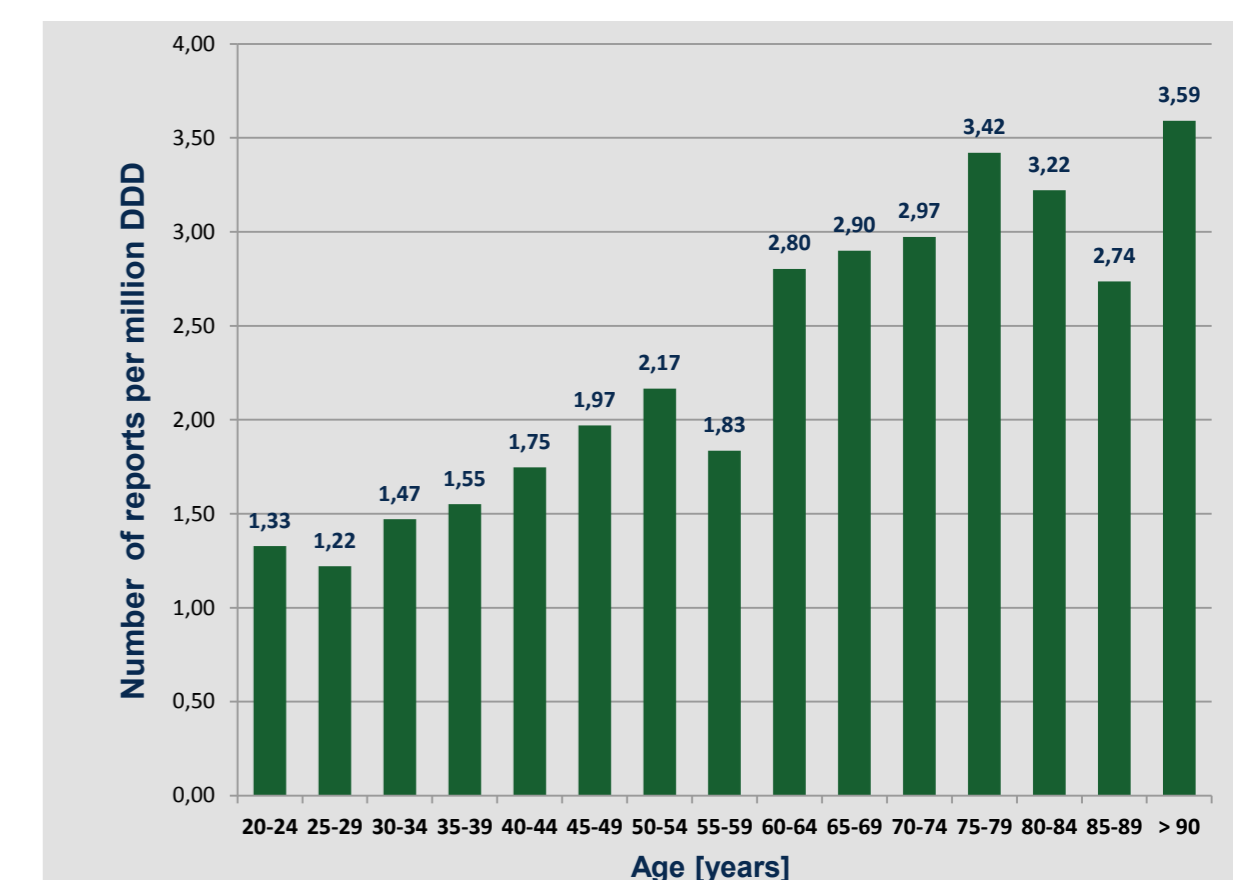


Figure 5: Rate of spontaneous reports per million prescribed defined daily doses (DDD) of antibiotics in relation to different age groups

Example 2: Antithrombotic agents

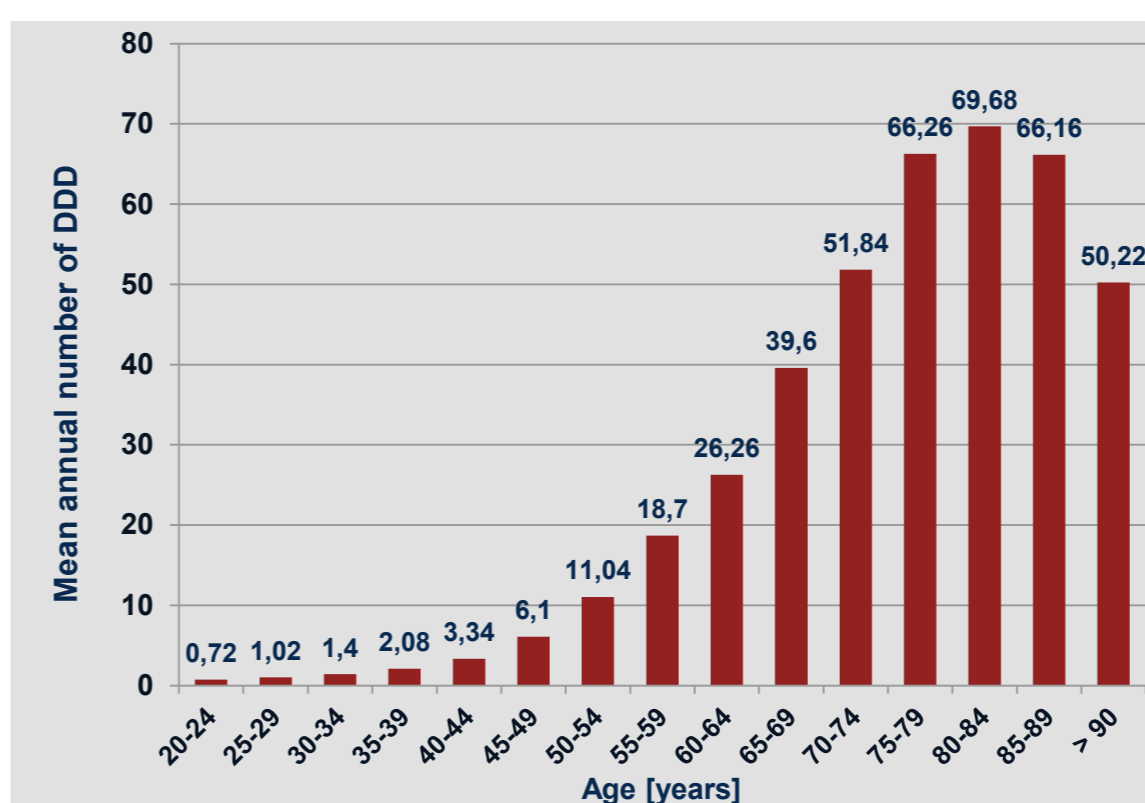


Figure 6: Mean annual number (2006–2010) of prescribed defined daily doses of antithrombotic agents (ATC B01) per insurant

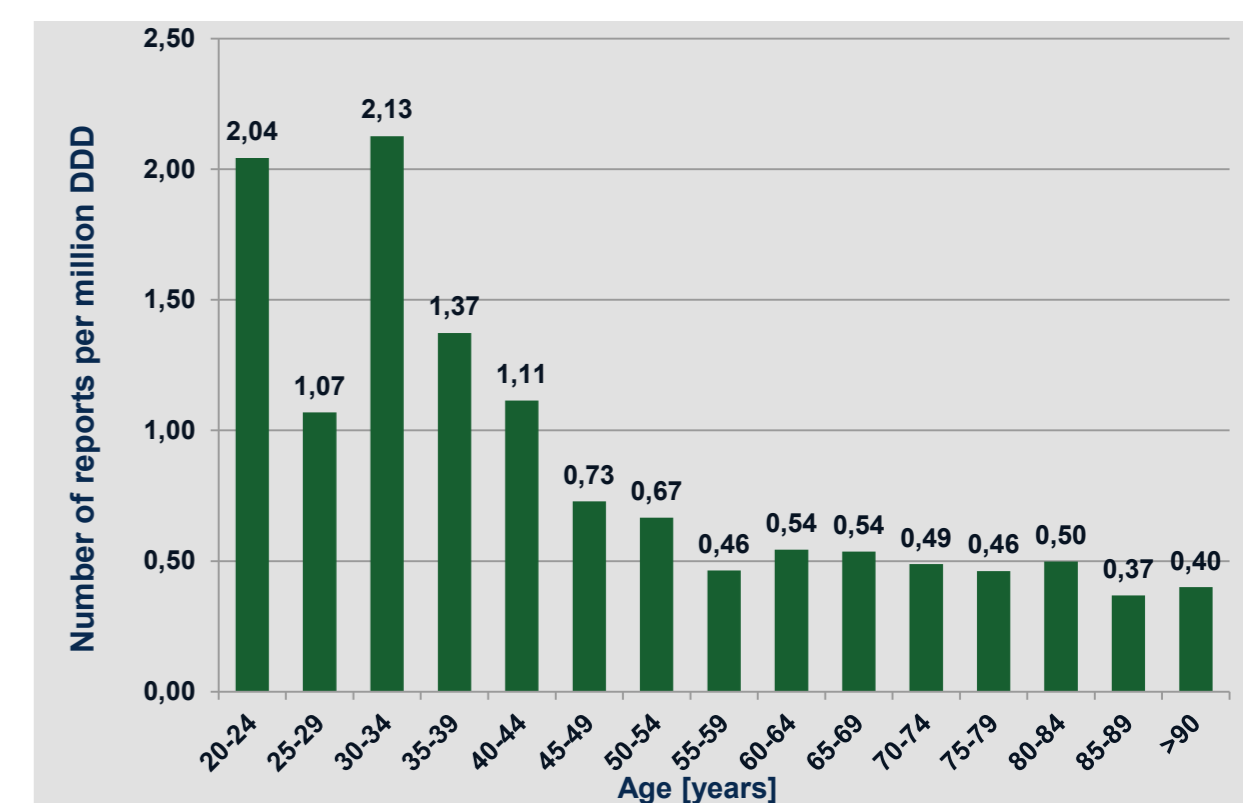


Figure 7: Rate of spontaneous reports per million prescribed defined daily doses (DDD) of antithrombotic agents in relation to different age groups

Example 3: Psycholeptics

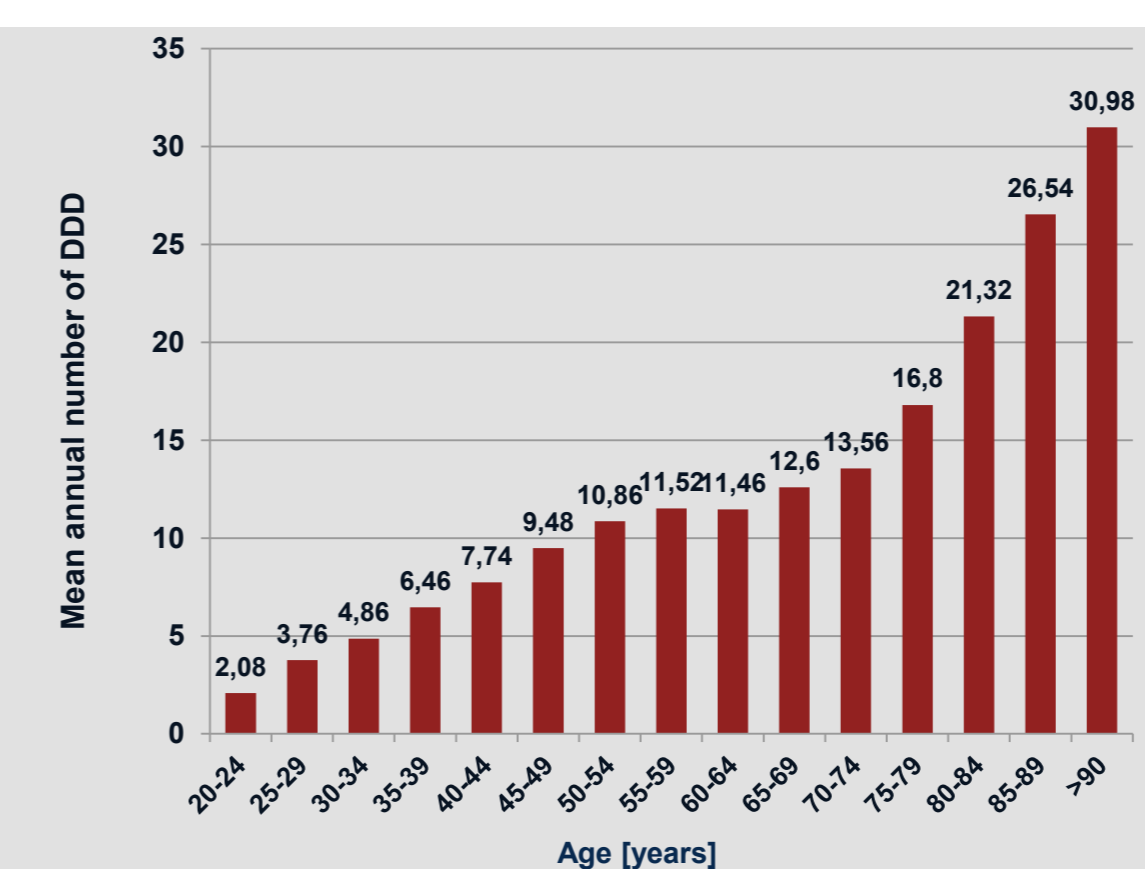


Figure 8: Mean annual number (2006–2010) of prescribed defined daily doses of psycholeptics (ATC N05) per insurant

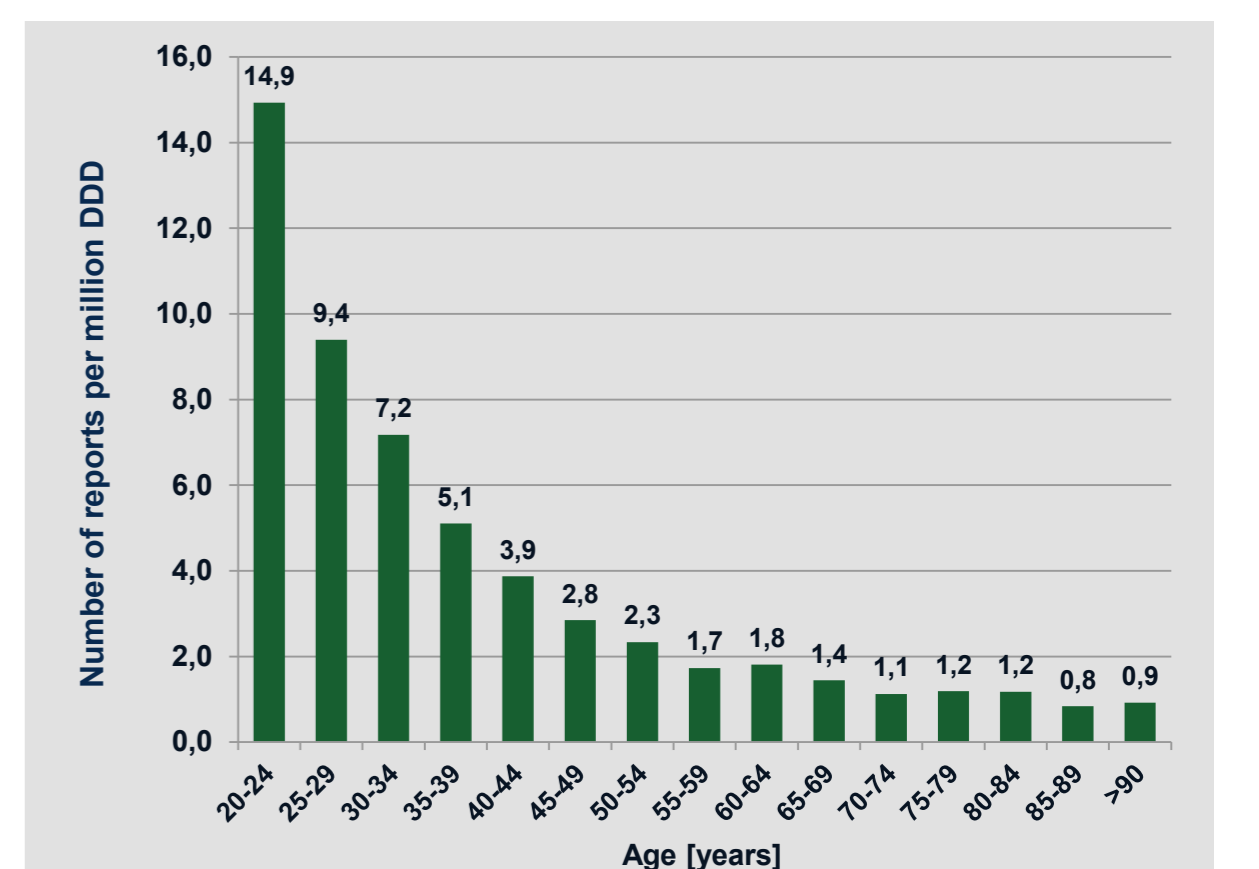


Figure 9: Rate of spontaneous reports per million prescribed defined daily doses (DDD) of psycholeptics in relation to different age groups

Discussion

The rate of spontaneous reports increased up to an age of 79, but declines in older age groups (≥ 85 years). If the age-related differences in drug usage are considered, the reporting rate of suspected adverse drug reactions is about ten times lower in elderly patients with high drug usage compared to younger age groups. The examples of antibiotics, antithrombotic agents and psycholeptics reveal significant differences in the age-dependant rates of spontaneous reports per prescribed defined daily doses for different drug classes. Since many studies have revealed a higher risk of adverse drug reactions in older patients, the reason for these observations require further investigation.

References

- Schwabe U, Paffrath D (ed): Arzneiverordnungs-Report (German Drug Report) 2011. Berlin, Heidelberg, Springer Medizin Verlag, 2011.
- Budnitz DS, Lovegrove MC, Shehab N, Richards CL: Emergency hospitalizations for adverse drug events in older Americans. *N Engl J Med* 2011; 365: 2002-2012.
- Ruiter R, Visser LE, Rodenburg EM, Trifiro G, Ziere G, Stricker BH: Adverse drug reaction-related hospitalizations in persons aged 55 years and over: a population-based study in the Netherlands. *Drugs Aging* 2012; 29: 225-232.
- Salvi F, Marchetti A, D'Angelo F, Boemi M, Lattanzio F, Cherubini A: Adverse drug events as a cause of hospitalization in older adults. *Drug Saf* 2012; 35 Suppl 1: 29-45.
- Zhang M, Holman CD, Price SD, Sanfilippo FM, Preen DB, Bulsara MK: Comorbidity and repeat admission to hospital for adverse drug reactions in older adults: retrospective cohort study. *BMJ* 2009; 338: a2752.