Forecasting outpatient pharmaceutical expenditure for cancer treatment in Germany

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OBJECTIVES
To allow budgeting of pharmaceutical expenditure for cancer drugs in Germany, we forecasted future outpatient pharmaceutical expenditure for cancer treatment from the perspective of the statutory health insurance (SHI) for 2016.

METHODS
The Techniker Krankenkasse (TK) is a large German sickness fund with more than 8.2 million insured. Based on routine data of the TK from April 2012 to March 2013 we calculated current pharmaceutical expenditure for 12 cancer indications (CPE). Indications were classified according to ICD-10 (table 1).

If a new drug is supposed to replace existing pharmaceuticals we subtracted costs of replaced drugs (table 2). If a new drug is supposed to be given additionally to be taken with the highest number of new drugs for this indication and expect new drugs to replace existing pharmaceuticals as well as to be given additionally (table 2). We also chose Breast Cancer because we expect the highest pharmaceutical expenditure of the 12 cancer indications in 2016 to be spent for Breast Cancer. We approximated the annual expenditure in 2016 based on TK data from April 2012 to March 2013. Therefore we defined probability distributions and generated random values by a sample size of 50,000. We considered (a) the expected monthly costs of new drugs (b) the extent to that new drugs will replace existing pharmaceuticals (c) the rate of market penetration. We used Statistical Analysis System (SAS) version 9.3 for computation of MC simulation.

RESULTS
According to our model, SHI outpatient pharmaceutical expenditure for these 12 cancer indications was overall million €2,780 in 2012, i.e., 9.5% of total outpatient pharmaceutical expenditure. 10 of them will at least partly replace existing pharmaceutical treatments (table 2).

In 2016, we expect annual outpatient pharmaceutical expenditure for the 12 cancer indications to increase by 17.2% to million €3,258 (1) (figure 1).

CONCLUSIONS
The Monte Carlo simulation revealed a median of million €322 for forecasted expenditure for NSCLC in 2016 and €1,231 for Breast Cancer respectively (figure 4). 50,000 out of 100,000 simulations showed results from million €305 (Q1) to €351 (Q3) for NSCLC and from million €1,210 (Q1) to 1,253 (Q3) for Breast Cancer.

The expected increase in costs for cancer drugs are a financial challenge for German SHI. Whether benefit of new drugs and expected costs can be considered fair value needs to be investigated elsewhere.