The Impact of Reference Pricing on Switching Behaviour and Healthcare Utilisation: The Case of Statins in Germany

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Background

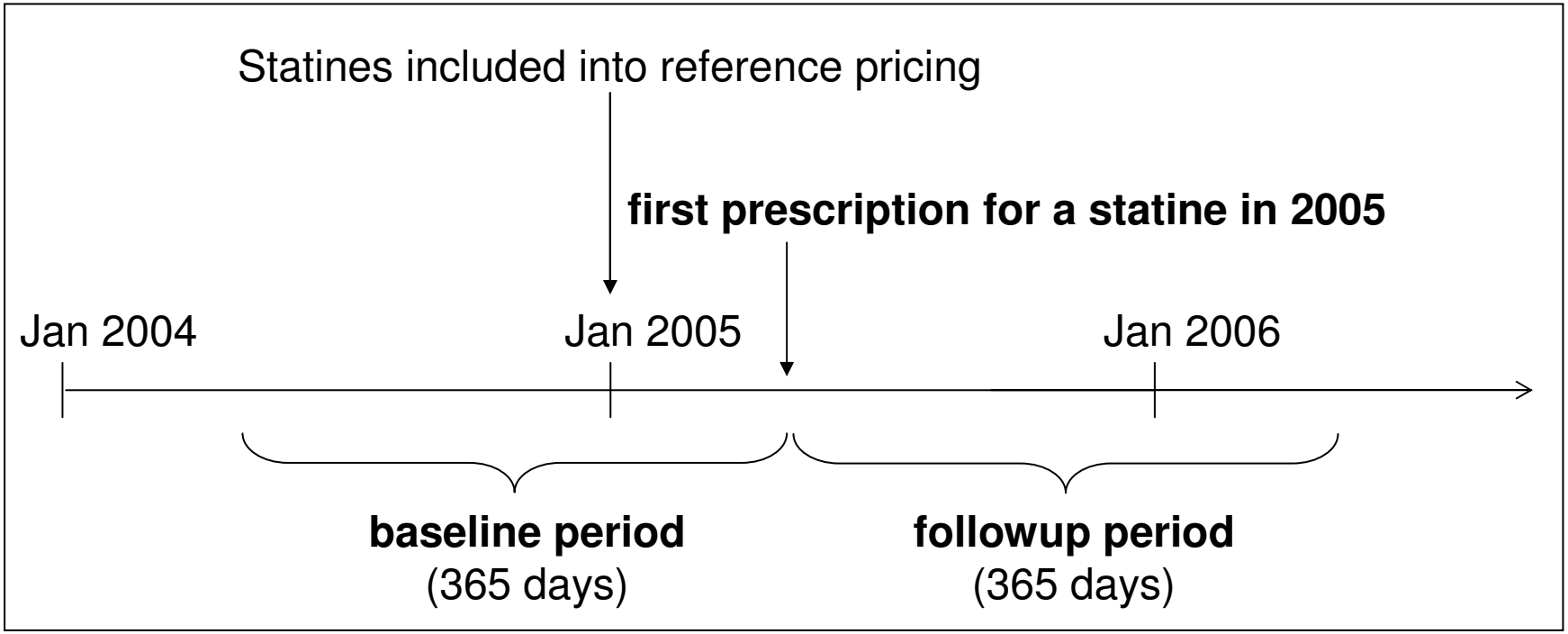
- Law on the German reference pricing scheme was change on 1 January 2004
  - On patent substances could now be included into reference pricing

- Statins were one of the first drug classes included into the reference pricing scheme after the change in law
  - Reference pricing cluster for statines includes atorvastatin, fluvastatin, lovastatin, pravastatin, simvastatin,

  - The manufacturer of atorvastatin claimed that its drug was superior to other statins (side effects, drug interaction profile)
  - The manufacturer of atorvastatin did not ‘comply’ with reference pricing (retail prices were set above the reference price).
  - Resulted in additional copayments for atorvastatin between €18.17 and €109.11 per package

Methods

- Patients with prescriptions for statins in 2004 were observed for 1 year before and 1 year after the policy change

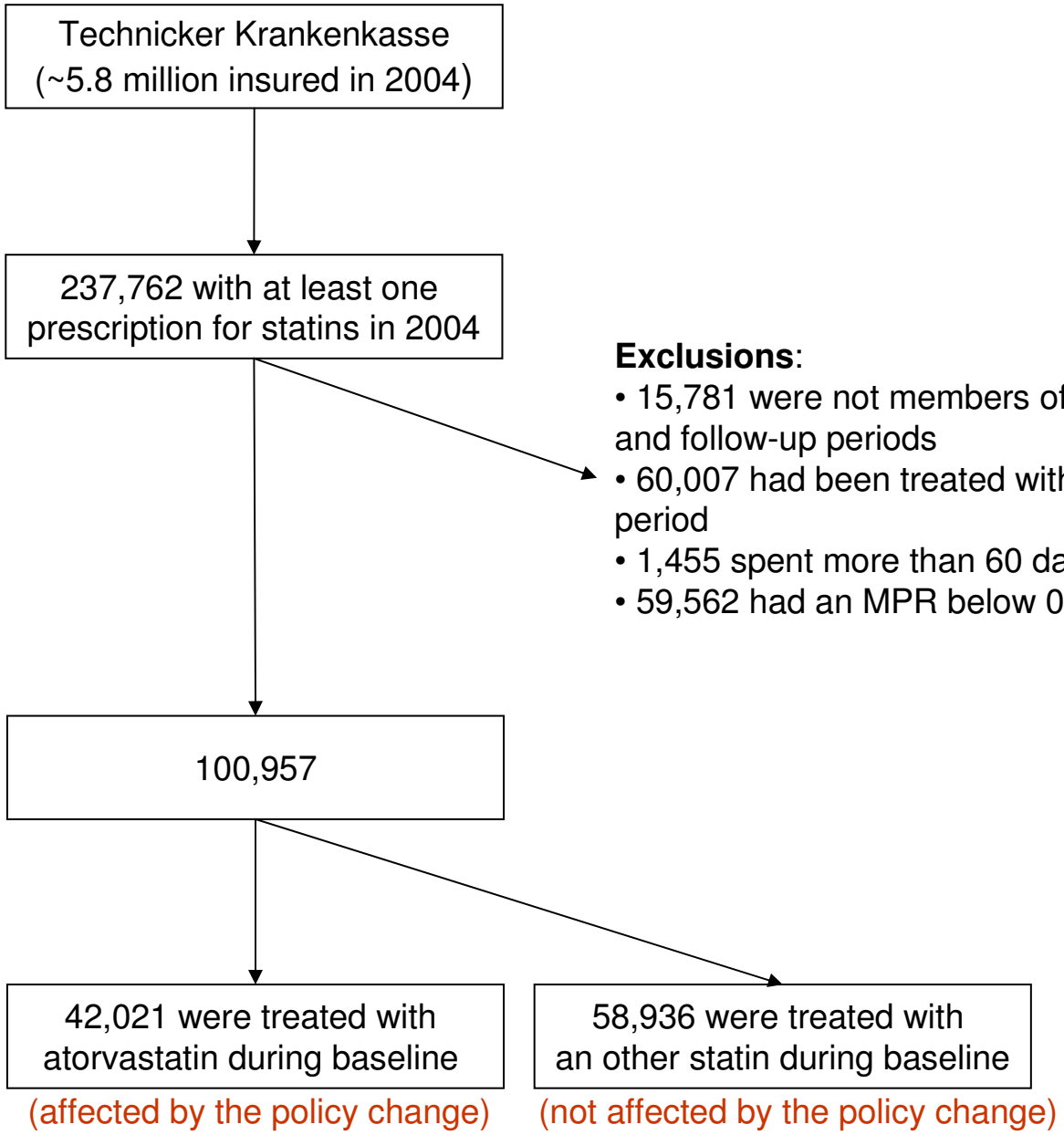


- Data on outpatient and inpatient visits, pharmaceutical consumption, and cost were collected from the Techniker Krankenkasse (a sickness fund with 5.8 million insured in 2005 [8.2%])

Methods

- Based on the medication used during the follow-up period
  - (I) treatment with the same statin during both periods
  - (II) switch to a statin other than that used during baseline period
  - (III) more than one medication switch during the follow-up period
  - (IV) non-adherence
- Medication possession ratios (MPRs) were calculated for both periods (cut point for non-adherence: 0.8)

- Switching behaviour was compared between patients affected by the policy change and those who were not
- Difference-in-differences in healthcare utilisation were compared for switchers and non-switchers.
- Savings from reference pricing were compared to additional costs caused by switching behaviour


Technicker Krankenkasse
(~5.8 million insured in 2004)
237,762 with at least one prescription for statins in 2004
Exclusions:
• 15,781 were not members of the sickness fund for the entire baseline and follow-up periods
• 60,007 had been treated with more than one statin during baseline period
• 1,455 spent more than 60 days in hospital during baseline period
• 59,562 had an MPR below 0.8 during the baseline period
100,957
42,021 were treated with atorvastatin during baseline
(affected by the policy change)
58,936 were treated with an other statin during baseline
(not affected by the policy change)

Results: Analysis of switching behaviour

Baseline \ Follow-up		No switch	Switch to an other statins: 1 switch	Switch to an other statins: >1 switch	Non-adherent to treatment (MPR<0.8)
(affected)	Atorvastatin	5,177 (12.3%)	15,814 (37.6%)	4,643 (11.1%)	16,387 (39.0%)
(not affected)	Other statin	38,022 (64.5%)	1,151 (2.0%)	1,392 (2.4%)	18,371 (31.1%)
		p <.0001*	p <.0001*	p <.0001*	p <.0001*

*Chi-Square Test Atorvastatin vs. Other statin. Bonferroni-Holmes splitting applied.

- Compared to patients *not affected* (other statin) by the policy change
  - switching from the baseline medication occurred significantly more often
  - adherence was significantly lower in patients affected by the policy change (atorvastatin).

Effect of switching on Healthcare Utilisation

Follow-up / Baseline	No switch	Switch to an other statins: 1 switch	Switch to an other statins: >1 switch	Non-adherent to treatment (MPR<0.8)
(affected) Atorvastatin	5,177 (12.3%)	15,814 (37.6%)	4,643 (11.1%)	16,387 (39.0%)
Other statin	38,022 (64.5%)	1,151 (2.0%)	1,392 (2.4%)	18,371 (31.1%)
	p <.0001*	p <.0001*	p <.0001*	p <.0001*

Atorvastatin in baseline period (MPR>0.8)
Did not switch medication in follow-up

Atorvastatin in baseline period (MPR>0.8)
Switched medication in follow-up (assumption: switching is due to the policy change)

Baseline characteristics of switchers and non-switchers

	non-switchers	switchers	p-value
Number of insured	5,177	36,844	(T-test/Chisq)
Mean age	63.70	63.67	0.8074
% female	24.8%	27.7%	<.0001
% male	75.2%	72.3%	<.0001
Healthcare utilisation			
Number of outpatient physician visits	9.90	10.00	0.2072
thereof specialist visits	7.11	7.16	0.5667
Number of hospital visits	0.38	0.37	0.4999
thereof ICD-10 I20	0.097	0.071	<.0001
thereof emergency visits	0.036	0.042	0.0530
Member of disease management programme			
% coronary heart disease	3.5%	3.2%	0.1974
% diabetes	4.7%	6.3%	<.0001
% breast cancer	0.1%	0.1%	0.6200
Income			
annual household income*	25,168 €	23,892 €	<.0001
% exempted from regular co-pay**	13.7%	18.8%	<.0001
Employment status			
% self-employed	8.1%	4.8%	<.0001
% salaried employer	26.7%	26.5%	<.0001
% in retirement	60.6%	63.1%	<.0001
% unemployed	2.6%	3.8%	<.0001
% others (e.g. students)	2.0%	1.8%	<.0001

Effect of switching on Healthcare Utilisation

Group (Medication) Number fo insured	Non-switcher (atorvastatin) 5,177				Switcher (1 statine) 15,814				Switcher (>1 statine) 4,643				Non-adherence 17,387			
	baseline	follow-up	diff.	**relative rate** [CI]	baseline	follow-up	diff.	**relative rate** [CI]	baseline	follow-up	diff.	**relative rate** [CI]	baseline	follow-up	diff.	**relative rate**[CI]
Outpatient sector																
Number of physician visits	9.90	10.27	0.37	**1.04** [1.02;1.05]	10.17	10.50	0.32	**1.03** [1.03;1.04]	10.50	11.12	0.61	**1.06** [1.05;1.07]*	9.70	10.25	0.55	**1.06** [1.05;1.06]*
thereof GP visits	2.79	2.85	0.06	**1.02** [1.01;1.03]	2.86	2.90	0.03	**1.01** [1.00;1.02]	2.95	3.09	0.14	**1.05** [1.03;1.06]*	2.80	2.90	0.10	**1.03** [1.03;1.04]
thereof specialist visits	7.11	7.42	0.31	**1.04** [1.03;1.06]	7.31	7.60	0.29	**1.04** [1.03;1.05]	7.56	8.02	0.47	**1.06** [1.05;1.08]	6.90	7.35	0.45	**1.07** [1.06;1.07]
Inpatient sector																
Number of hospital visits	0.378	0.350	-0.029	**0.92** [0.85;0.99]	0.386	0.398	0.012	**1.03** [0.99;1.08]	0.403	0.445	0.042	**1.10** [1.02;1.19]**	0.345	0.345	0.000	**1.00** [0.95;1.05]
thereof ICD-10 I20	0.097	0.077	-0.020	**0.80** [0.67;0.92]	0.080	0.062	-0.019	**0.77** [0.69;0.85]	0.086	0.091	0.005	**1.05** [0.89;1.22]**	0.058	0.044	-0.014	**0.75** [0.66;0.85]
thereof emergency visits	0.036	0.038	0.003	**1.08** [0.86;1.28]	0.045	0.044	0.000	**0.99** [0.87;1.11]	0.044	0.052	0.008	**1.18** [0.95;1.41]	0.038	0.037	-0.001	**0.97** [0.85;1.08]
Pharmaceutical care																
no. of prescriptions for statins	2.63	3.13	0.50	**1.19** [1.18;1.21]	2.63	3.77	1.14	**1.43** [1.42;1.44]**	2.69	3.10	0.41	**1.15** [1.13;1.17]**	2.48	1.44	-1.05	**0.58** [0.57;0.59]**
WHO-DDD dispensed																
statines	495.1	722.7	227.6	**1.46** [1.44;1.48]	478.2	693.9	215.7	**1.45** [1.44;1.46]	538.4	584.0	45.5	**1.08** [1.06;1.11]**	369.1	169.4	-199.7	**0.46** [0.45;0.47]**
fibrates	2.4	2.5	0.16	**1.07** [0.89;1.25]	2.1	2.5	0.44	**1.21** [1.09;1.34]	3.2	4.2	1.01	**1.32** [1.14;1.50]	2.25	3.89	1.64	**1.73** [1.55;1.91]**
bile acid sequestr…	0.5	0.4	-0.04	**0.91** [0.72;1.10]	0.3	0.3	-0.01	**0.97** [0.80;1.14]	0.5	0.5	0.02	**1.05** [0.73;1.37]	0.13	0.11	-0.01	**0.89** [0.38;1.40]
nicotinic acid	0.5	0.8	0.31	**1.65** [1.22;2.08]	0.3	0.6	0.27	**1.91** [1.53;2.29]	0.4	0.6	0.26	**1.69** [1.07;2.33]	0.16	0.28	0.11	**1.70** [1.16;2.23]

- No significant difference in healthcare utilisation between non-switchers and switchers (1 switch)
- Number of physician visits is significantly different between non-switchers and non-adherence group
- Number of physician visits and number of hospital visits is significantly different between non-switchers and patients who switched more than once

Effect of switching on Healthcare Utilisation (II)

Group (Medication)	Non-switcher (atorvastatin)				Switcher (1 statine)				Switcher (>1 statine)				Non-adherence			
Number fo insured	5,177				15,814				4,643				17,387			
	baseline	follow-up	diff.	**relative rate** [CI]	baseline	follow-up	diff.	**relative rate** [CI]	baseline	follow-up	diff.	**relative rate** [CI]	baseline	follow-up	diff.	**relative rate**[CI]
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- Compared to the baseline period, there was an increase in prescription volume of statines for non-switchers and switchers in follow-up

Calculation of savings

- Because of the increase in prescription volume in follow-up of which it is not sure whether it is due to the policy change or not, savings in statin therapy were calculated twice
  - a) based on the prescription volume for 2004
  - b) based on the difference in the cost of statin therapy for the study population (including the increase in prescription volume)

Conclusions (I)

- Reference pricing for statins in Germany led to substantial savings for the sickness funds
- Similar to the results from British Columbia
  - no increase in physician visits or hospital visits was found for most of the switcher groups
- Unlike to the results from British Columbia there is evidence of
  - increased non-adherence to treatment among patients who were affected by the policy change.
  - A subgroup of patients who switched more than once during the follow-up period had significantly more hospital visits due to cardiovascular disease.
  - Higher rates were not only observed during the first 3 months after the initial switch

Conclusions (II)

- This might be because of the
  - the different design of the reference pricing scheme in both countries,
  - the different drug class analysed compared to Schneeweiss et al.,

- Results suggest that there seems to be a trade-off between cost-containment and treatment goals if manufacturers do not ‚comply' with reference pricing
- However, in a 'normal' case (only for ~7% of the packages subject to reference pricing there are additional co-payments), the consumer will not be affected by the German reference pricing scheme